NOTICE OF PREPARATION
OF AN ENVIRONMENTAL IMPACT REPORT AND
NOTICE OF PUBLIC SCOPING MEETING FOR
THE CITY OF FRESNO FULTON MALL RECONSTRUCTION PROJECT

Date: October 15, 2013

To: Office of Planning and Research, Responsible and Trustee Agencies, Other Public Agencies and Other Interested Parties

From: Elliott Balch, Downtown Revitalization Manager

Subject: Notice of Preparation of an Environmental Impact Report and Notice of Public Scoping Meeting for the City of Fresno Fulton Mall Reconstruction Project

Project Title: City of Fresno Fulton Mall Reconstruction Project

Project Applicant: City of Fresno

Notice of Preparation: In compliance with Section 15082(a) of the California Environmental Quality Act (CEQA) Guidelines, the City of Fresno, as the Lead Agency, has prepared this Notice of Preparation (NOP) of an Environmental Impact Report (EIR) for the City of Fresno Fulton Mall Reconstruction Project, which is generally described below. We need to know the views of your agency as to the scope and content of the environmental information that is germane to your agency's statutory responsibilities in connection with the Project. Your agency may need to use the EIR prepared by our agency when considering your permit or other approvals for the project.

All interested federal, State, and local agencies and the public are invited to comment on the scope of the EIR. If you are an agency with jurisdiction by law over natural or other public resources affected by the Project, the City of Fresno needs to know what environmental information germane to your statutory responsibilities should be included in the EIR.

Based on the findings in the Initial Study, the City has determined that a Project EIR in accordance with Section 15161 of the State CEQA Guidelines will be prepared and will focus on the significant and unavoidable impacts associated with the project. The issues found to result in no impact, less than significant impact, and less than significant after the incorporation of mitigation are considered adequately addressed in the Initial Study. The significant and unavoidable impacts that will be addressed in the Project EIR include historical resources and short-term aesthetics.

This NOP and Initial Study provides information describing the project and the potential environmental effects to enable the Office of Planning and Research and the Responsible and Trustee agencies to make a meaningful response to the City of Fresno regarding the scope and content of the environmental issues that will be evaluated in the Project EIR. The City of Fresno is inviting written comments from the public regarding the scope and content of the environmental issues to be evaluated in the Project EIR.

A complete project description, location, and probable environmental effects are contained in the Initial Study. The Initial Study is available for review at the following website: **www.fresno.gov/fultonmall**

Additionally, hardcopies of the Initial Study and NOP are available for public review at the following locations: City of Fresno, **City Clerk's Office**, 2600 Fresno Street, 2nd Floor, Fresno, CA 93721; **Central Library**, 2420 Mariposa Street, Fresno, CA 93721; and **Downtown Fresno Partnership**, 845 Fulton Mall, Fresno, CA 93721.

Due to the time limits mandated by State law, **your response to this NOP must be received by November 15, 2013**. Please send your comments to Elliott Balch, Downtown Revitalization Manager, City of Fresno, City Manager's Office, 2600 Fresno Street, 2nd Floor, Fresno, CA 93721. Telephone: (559) 621-8366; Email: Elliott.Balch@fresno.gov.

Public Scoping Meeting: In compliance with Section 15082(c)(1) of the CEQA Guidelines, the City of Fresno will hold a scoping meeting because the proposed Project requires an amendment to the City's General Plan Circulation Element, and

thus is considered a project of area-wide significance. The purpose of the meeting will be to allow any person or agency that may be concerned with the environmental effects of the Project to express those concerns directly to the City. Information gained at the scoping meeting and from the NOP will be used to identify the range of actions, alternatives, mitigation measures, and significant effects to be analyzed in depth in the forthcoming EIR. **The City of Fresno will host the public scoping meeting on Tuesday, November 5, 2013 at 5:30 p.m.** in the City Hall Council Chambers, 2600 Fresno Street, 2nd Floor, Fresno California, 93721. The public scoping meeting will provide a brief overview of CEQA and its processes as they pertain to the Project, as well as provide a venue to solicit comments from concerned agencies and the public regarding the scope and content of the EIR.

Project Description: The City of Fresno (City) is proposing the Fulton Mall Reconstruction Project to improve parking and vehicle access to local businesses on Fulton Street in order to maximize sustainable development and economic productivity in conjunction with other downtown redevelopment projects. The proposed project would also be intended to lower crime and improve safety for people walking between parking areas and businesses located on the Fulton Mall and for people who live in, work in, and visit the project area.

The City proposes to reconstruct Fulton Mall as a complete street by reintroducing vehicle traffic lanes to the existing pedestrian mall. The Mall consists of six linear blocks that were open to traffic prior to 1964 but now do not allow public vehicle access. The Mall is bounded by Tuolumne Street to the north and Inyo Street to the south, and includes portions of three cross streets. The total length of the new roadways would be 0.74 mile.

The "Mall" refers specifically to the pedestrian areas between adjoining buildings located on the former City streets of Fulton, Mariposa, Merced, and Kern, which function as an integrated pedestrian mall. Fresno Street and Tulare Street, which do allow vehicle traffic, run through the Mall and divide it into three roughly equal sections. Mall landscaping elements include fountains, planters, benches, sculptures, electrical systems, and irrigation systems. The Project also includes relocation of two tot lots, funded with State and federal grant monies, which are currently located in the Fulton Mall. These tot lots will be relocated near the intersection of Mariposa Street and Congo Alley. The Mall does not include the adjoining buildings or their facades.

The City is proposing two build alternatives for the Fulton Mall Reconstruction Project. These two build alternatives propose to reconstruct the Mall using "complete streets" design concepts. Complete streets are those designed to function as shared public space, or as "living streets" - for pedestrians, cyclists, outdoor businesses, and slow-moving, cautiously driven vehicles. Complete streets may include narrow roadways, corner bulb-outs, winding streets, and other traffic calming measures to lower driving speeds; street trees and other landscape elements; wide pedestrian sidewalks and crosswalks; and bicycle accommodations such as dedicated bicycle lanes or wide shoulders. The purpose of incorporating these design concepts into the proposed project is to retain portions of the historic fabric and character of the Mall, maintaining the key elements, feeling and unique experience of a pedestrian mall in downtown Fresno while providing the additional functionality and economic benefits associated with vehicular access to the buildings fronting the mall.

In addition, the project will be used by the City of Fresno as the supporting environmental documentation for the following project approvals (1) General Plan Circulation Element Amendment, (2) Plans and Specifications, (3) Construction Funding, (4) Central Area Community Plan Amendment, (5) Conditional Use Permit, (6) Property Acquisition, and (7) Fresno Municipal Code Amendments.

For a complete description of the proposed project, please review the Notice of Preparation and a copy of the Initial Study at the website or locations referenced above.

Date: October 15, 2013 Signature: Elliott Balch

Title: Downtown Revitalization Manager

Address: 2600 Fresno Street, 2nd Floor, Fresno, CA 93721

Telephone: 559.621.8366

E-mail: Elliott.Balch@fresno.gov

Reference: California Administrative Code, Title 14, Sections 15082(a), 15103, 15375.

Initial Study
Fulton Mall Reconstruction Project
City of Fresno, Fresno County, California

Prepared for:
City of Fresno
2600 Fresno Street
Fresno, CA 93721
559.621.8371

Contact: Wilma Quan, Urban Planning Specialist

Prepared by:
FirstCarbon Solutions
220 Commerce, Suite 200
Irvine, CA 92602
714.508.4100

Contact: Michael Houlihan, AICP

Report Date: October 15, 2013

Table of Contents

Section 1: Introduction 1
1.1 - Purpose 1
1.2 - Project Location 1
1.3 - Project Description 2
1.4 - Intended Uses of this Document 3
1.5 - Environmental Setting 4

Section 2: Environmental Checklist 17

Section 3: Environmental Evaluation 29
3.1 - Aesthetics 29
3.2 - Agriculture and Forestry Resources 39
3.3 - Air Quality 43
3.4 - Biological Resources 74
3.5 - Cultural Resources 81
3.6 - Geology and Soils 98
3.7 - Greenhouse Gas Emissions 104
3.8 - Hazards and Hazardous Materials 115
3.9 - Hydrology and Water Quality 123
3.10 - Land Use and Planning 135
3.11 - Mineral Resources 146
3.12 - Noise 147
3.13 - Population and Housing 166
3.14 - Public Services 169
3.15 - Recreation 173
3.16 - Transportation and Traffic 174
3.17 - Utilities and Service Systems 185
3.18 - Mandatory Findings of Significance 194

Section 4: References 197

Appendix A: Visual Impact Assessment

Appendix B: Air Quality Report

Appendix C: Biological Resources Report

Appendix D: Cultural Resources Report
D.1 - Archaeological Report
D.2 - Paleontological Report

Appendix E: Geologic Hazards Report

Appendix F: Hazardous Materials
F.1 - Supplemental Assessment to Fulton Mall Corridor Phase I Environmental Site Assessment
F.2 - Additional Hazardous Materials Information

Appendix G: Sole-Source Aquifer - Water Quality Assessment

Appendix H: Community Impact Assessment

Appendix I: Noise Study

Appendix J: Traffic

J.1 - Traffic Study
J.2 - Supplemental Traffic Study

Appendix K: Utility Information

K.1 - Utility Technical Report
K.2 - Water Memorandum
K.3 - Sewer Memorandum

List of Tables

Table 1: Land Use and Building Square Footage within the Vicinity of Fulton Mall 5
Table 2: Development Potential Within FCSP and DNCP 7
Table 3: 2008 Inventory Fresno County 45
Table 4: Air Quality Monitoring Summary 46
Table 5: National and California Ambient Air Quality Standards 48
Table 6: San Joaquin Valley Air Basin Attainment Status 51
Table 7: Significant Emissions Thresholds 59
Table 8: Construction Duration - Fulton Mall 60
Table 9: Construction Duration - Cross Malls 60
Table 10: Hauling Miles- Fulton Mall Alternative 63
Table 11: Hauling Miles - Cross Malls 63
Table 12: Annual Construction Emissions (Alternative 1) 64
Table 13: Localized Carbon Monoxide Concentrations 65
Table 14: Hauling Miles- Fulton Mall Alternative 2 67
Table 15: Annual Construction Emissions (Alternative 2) 67
Table 16: Screening Levels for Potential Odor Sources 73
Table 17: Summary of Short-Term Measurements 148
Table 18: Maximum Allowable Noise Exposure for Noise Sensitive Land Uses 150
Table 19: Maximum Allowable Noise Exposure-Stationary Noise Sources1 152
Table 20: SEC. 10-102 of the Noise Ordinance of the City of Fresno 153
Table 21: Construction Equipment Noise 154
Table 22: Vibration Levels Generated by Construction Equipment 160

List of Exhibits

Exhibit 1: Regional Vicinity Map 11
Exhibit 2: Project Site 13
Exhibit 3: Existing Land Use 15

SECTION 1: INTRODUCTION

1.1 - Purpose

The purpose of this Initial Study is to identify the potential impacts associated with the construction and operation of the Fulton Mall Reconstruction project. Pursuant to Section 15367 of the California Environmental Quality Act (CEQA) Guidelines, the City of Fresno is the Lead Agency in preparation of this Initial Study. The City of Fresno has primary responsibility for approval or denial of the proposed project and will ultimately be responsible for project implementation. This review of the project is consistent with CEQA Guideline Section 15063(a). Through this review, the City of Fresno has found that the Fulton Mall Reconstruction project will result in no impacts, less than significant impacts, less than significant impacts with mitigation incorporated, and potentially significant impacts. The potentially significant impacts are anticipated to be significant impacts where mitigation may not be available to reduce the potential impacts to less than significant, and therefore, the impacts are expected to remain significant and thus unavoidable.

In accordance with CEQA Section 15063(b)(1)(A), if a Lead Agency such as the City of Fresno determines that there is substantial evidence that any aspect of the project, either individually or cumulatively, may cause a significant effect on the environment, the agency shall prepare an EIR. The City of Fresno acknowledges that an EIR is required to be prepared for the Fulton Mall Reconstruction Project. As addressed in CEQA section 15063(c)(3)(A), one of the purposes of the Initial Study is to assist in the preparation of an EIR by focusing the EIR on the effects determined to be significant.

Therefore, this Initial Study provides adequate documentation to address environmental issues that were found to have no impact, less than significant impact, and less than significant impact with mitigation incorporated. These environmental issues will not be further evaluated in the forthcoming EIR. This Initial Study also identifies the environmental impacts that are expected to be potentially significant and result in significant and unavoidable impacts. These issues will be further evaluated in the forthcoming EIR. As described in this Initial Study, the potential significant and unavoidable impacts that well be addressed in the forthcoming EIR include short-term aesthetics and historical resources.

1.2 - Project Location

The proposed Fulton Mall Reconstruction project is located in Downtown Fresno (see Exhibit 1). Fulton Mall consists of six blocks bounded by Van Ness Avenue to the east, Inyo Street to the south, Broadway/H Street to the west, and Tuolumne Street to the north (see Exhibit 2). Tulare Street and Fresno Street divide the Mall into three equal portions. The project site includes the existing 80-foot rights-of-way within Fulton Mall including Fulton between Inyo Street to Tulare Street, Tulare Street and Fresno Street, and Fresno Street and Tuolumne Street. The project also includes the existing 80-foot rights-of-way along (1) Kern between Federal Alley and Home Run Alley, (2) Mariposa between Van Ness Avenue and Broadway, and (3) Merced between Federal Alley and Congo Alley.

1.3 - Project Description

The purpose of the proposed project is to improve parking and vehicle access to local businesses on Fulton Street in order to maximize sustainable development and economic productivity in conjunction with other downtown redevelopment projects. The proposed project would also be intended to lower crime and improve safety for people walking between parking areas and businesses located on the Fulton Mall and for people who live in, work in, and visit the project area.

The California Department of Transportation (Caltrans), as assigned by the Federal Highway Administration (FHWA), in cooperation with the City of Fresno (City) proposes to reconstruct Fulton Mall as a complete street by reintroducing vehicle traffic lanes to the existing pedestrian mall. The Mall consists of six linear blocks that were open to traffic prior to 1964 but now do not allow public vehicle access. The Mall is bounded by Tuolumne Street to the north and Inyo Street to the south, and includes portions of three cross streets. The total length of the new roadways would be 0.74 mile.

The “Mall” refers specifically to the pedestrian areas between adjoining buildings located on the former City streets of Fulton, Mariposa, Merced, and Kern, which function as an integrated pedestrian mall. Fresno Street and Tulare Street, which do allow vehicle traffic, run through the Mall and divide it into three roughly equal sections. Mall landscaping elements include fountains, planters, benches, sculptures, electrical systems, irrigation systems, and two “tot lots.” The Mall does not include the adjoining buildings or their facades.

The City of Fresno is proposing two build alternatives for the Fulton Mall Reconstruction Project. These two build alternatives propose to reconstruct the Mall using “complete streets” design concepts. Complete streets are those designed to function as shared public space, or as “living streets” - for pedestrians, cyclists, outdoor businesses, and slow-moving, cautiously driven vehicles. Complete streets may include narrow roadways, corner bulb-outs, winding streets, and other traffic calming measures to lower driving speeds; street trees and other landscape elements; wide pedestrian sidewalks and crosswalks; and bicycle accommodations such as dedicated bicycle lanes or wide shoulders. The purpose of incorporating these design concepts into the proposed project is to retain portions of the historic fabric and character of the Mall, maintaining the key elements, feeling and unique experience of a pedestrian mall in downtown Fresno.

This Initial Study addresses two build alternatives, which are described as follows.

Alternative 1

Alternative 1 consists of reopening the Mall with two-way streets, with one lane of vehicular traffic in each direction alongside bicycle, pedestrian, and potentially other travel modes. On-street vehicle parking spaces would be reintroduced along the length of the Mall (including cross streets), and construction of streetscape improvements would optimize the streets for the new blend of travel modes. One 11-foot vehicle travel lane would run in each direction, with a parallel parking lane of 9 feet included on both sides of the streets. A 20-foot sidewalk included on both sides of the streets would allow for walking and pedestrian-only seating, landscaping, lighting, and public art.

The existing 20 works of sculpture present on the Mall today would all remain, though some may be moved to be incorporated in sidewalk areas of the new streetscape. Only the three fountains found along the Kern Mall, west of Fulton, would remain. All of the planter beds and raised seating areas found along the Mall today would be removed in favor of wide sidewalks that incorporate artwork and seating areas. The two tot lots present, one located near the corner of Merced and Fulton, and the other located near the corner of Kern and Fulton, would be consolidated into one larger tot lot at the Fresno County Economic Opportunities Commission campus near the intersection of Mariposa and Congo Alley.

Alternative 2

Alternative 2 consists of reconnecting the street grid as in Alternative 1, but would include rebuilding distinctive elements of the Mall in five to six specific locations, known as "vignettes." The vignettes would include many of the existing elements (sculptures, fountains, pavement pattern, trees, etc.). One 11-foot vehicle travel lane would run in each direction and would curve through the vignettes to avoid existing landscape features. Outside the vignette areas, the street would be straight, and the landscape would include a 9- foot parallel parking lane and a pedestrian-only walking, seating, vegetation, and public art area 20 feet in width on one or both sides of the street. Within the vignettes, the existing Mall landscape elements would be kept maximally intact. The remaining space on each side of the street would be dedicated to pedestrian travel, seating, vegetation, and artwork.

A total of 12 fountains—nine in vignettes and 3 on Kern Mall west of Fulton—would remain in place. The 12 fountains would be fully rebuilt or restored to working order. Fourteen of 20 sculptures would remain in their precise current locations. The other six (along with the various tile mosaics benches on the Mall today) would be reconfigured differently within the current right-of-way to accommodate the new streetscape. Street lighting outside the vignettes would be contemporary and pedestrian-oriented, but the original Mall fixtures would be rehabilitated within each vignette. The two tot lots present, one located near the corner of Merced and Fulton, and the other located near the corner of Kern and Fulton, would be consolidated into one larger tot lot at the Fresno County Economic Opportunities Commission campus near the intersection of Mariposa and Congo Alley.

1.4 - Intended Uses of this Document

This Initial Study prepared for the Fulton Mall Reconstruction Project would be used by the City of Fresno as the supporting environmental documentation for the following project approvals.

- General Plan Circulation Element Amendment - An amendment to the 2025 Fresno General Plan Circulation Element is required to designate the portions of Fulton Street, Kern Street, Mariposa Street, and Merced Street that are collectively known as Fulton Mall to Collector Streets. Currently, Fulton Mall does not have a roadway classification on the City of Fresno Circulation Element Map.
- Plans and Specifications - Approval of the plans and specifications for the street improvements.

- Construction funding - Approval of financing provided by the City of Fresno.
- Central Area Community Plan (CACP) Amendment - Amend the narrative and policies found on pages 84 through 93 of the CACP related to keeping the Fulton Mall a pedestrian mall to provide for complete streets.
- Conditional Use Permit - Approval of a conditional use permit is required for the construction and use of a new Tot Lot that will replace the Tot Lots currently on the Fulton Mall.
- Property Acquisition - Approval is required for the acquisition of the small parcel on which the new Tot Lot will be located.
- Fresno Municipal Code (FMC) Amendments - Amendments to various FMC sections regulating the Fulton Mall, including FMC, sections 14-1801 et seq., will be required to allow for the access and uses contemplated by the Project.

1.5 - Environmental Setting

Existing Setting

The project site is a pedestrian mall that contains various features. These features include pavement with a pattern that resembles the contours of the natural landscape, trees, shrubs, flowers, planters, seating areas, benches, sculptures, water features, and two tot lots. The overall appearance of the project site is that it is minimally maintained; the pavement is dirty, with numerous areas of food stains, discarded chewing gum, cigarette butts, and the pavement is cracked in many locations. The trees include roots that have cracked the pavement in numerous locations. Many of the planter walls and curbs are cracked. Some sculptures have been vandalized and others are not prominently displayed or identified. Some of the fountains have also been vandalized and have been inoperable for many years. The plaster on the fountains is cracked and the pumps and/or lighting are inoperable and have become repositories for debris, discarded bits of food, and cigarette butts.

Immediately adjacent to the project site are the buildings that line Fulton Mall. These buildings consist of one, two, three, and multiple-story structures. The tallest structure is the Pacific Southwest Building, which is 16 stories in height. Because of the ground floor vacancies within Fulton Mall, which is approximately 26 percent, many of the businesses have industrial-looking metal gates that extend across the storefront indicating that the building space is vacant and abandoned.

Fulton Mall as well as the area immediately adjacent to Fulton Mall includes various land uses. The area adjacent to Fulton Mall is bound by Van Ness Avenue on the east, Inyo Street on the south, Broadway/H Street on the west, and Tuolumne Street on the north. This area included the boundaries of the original superblock form that was envisioned when the Fulton Mall was originally designed. Within this area, there are office, retail/restaurant, recreation-clubhouse, other commercial such as a hotel and theater, and residential (see Exhibit 3). The structures located along Fulton Mall include multiple stories with storefronts on the ground floor and additional uses within the upper stories. Table 1 depicts the amount of building square footage for each land use within the study area.

Table 1: Land Use and Building Square Footage within the Vicinity of Fulton Mall

Land Use	Total Building Square Footage
Office[1]	648,964
Retail/Restaurant[2]	1,232,504
Rec - Clubhouse[3]	46,007
Other Commercial[4]	164,075
Residential[5]	149,003
Parking	239,184
Total	2,479,737

Notes:
[1] Office is identified on Figure 2-1 as CO and PGO.
[2] Retail/Restaurant is identified on Figure 2-1 as CGH and CR.
[3] Recreation Clubhouse is identified on Figure 2-1 as CCR. This includes the clubhouse facilities associated with Chukchansi Park.
[4] Other Commercial is identified on Figure 2-1 as CGH.
[5] Residential is identified on Figure 2-1 as RH. There is a co designation that currently includes residential.
Source: Rosenow Spavacek Group, Inc., 2012.

The project vicinity also includes surface parking, structured parking, and a vacant lot. This area includes approximately 2,800 parking spaces. Approximately 75 percent of those spaces are located within structures while 25 percent of the parking spaces are within surface parking lots. There are 14 on-street parking spaces within the study area. There is one vacant lot at the southwest corner of Tulare Street and Van Ness Avenue. The vacant lot encompasses approximately 20,000 square feet (sf).

In addition to land uses within the existing structures along Fulton Mall, there are two recreational areas for children within Fulton Mall. These areas are tot lots with playground equipment and sand areas. One of the tot lots is located within Fulton Mall immediately north of Kern Mall and encompasses 966 sf of active play equipment area. The second tot lot is also within Fulton Mall immediately south of Merced Mall and encompasses 806 sf of active play equipment area. These lots were improved with new play equipment in 2008 using federal Land and Water Conservation Fund (LWCF) and State Proposition 40 grant dollars, and their future use and conversion is governed by Section 6(f) of the LWCF Act and the rules and guidelines governing the use of Proposition 40 grant funds. Today most, though not all, of this equipment remains functional for the children to use.

Cumulative Projects

In the vicinity of Fulton Mall, there are various development applications that have been submitted to the City. In addition to these development projects, future developments in accordance with two currently proposed plans are also identified as cumulative future projects. Together, these current

and future projects represent the related projects that are considered within the cumulative impact evaluations prepared in Section 3 of this Initial Study. The general location of these projects and plans is generally referred to as Downtown Fresno.

Following is the information for the development application in the vicinity of Fulton Mall.

1. CVS is proposing to relocate from their current location at the northeast corner of Fulton Mall and Merced Mall and construct a new 15,524 sf retail store at the corner of Van Ness Avenue and Tuolumne Street. Construction is anticipated to be completed in 2014.
2. 1155 Fulton Mall - Tenant improvements are proposed with minor exterior improvements for new Federal offices. These improvements are anticipated to be completed in 2013.
3. 1101 Fulton Mall - Tenant improvements are proposed for a new restaurant. Timing of these improvements is not known.
4. 959 Fulton Mall (JC Penney Building) - Tenant improvements are proposed for approximately 66 residential units on the second through the fifth floors. According to property owner, timing of these improvements are contingent on the Fulton Mall Reconstruction Project.
5. Pacific Southwest Building at the southeast corner of Fulton Mall and Mariposa Mall - Tenant improvements are proposed for a restaurant lounge on the 15th and 16th floors. According to property owner, timing of these improvements are contingent on the Fulton Mall Reconstruction Project.
6. Hotel Californian at the southwest corner of Van Ness Avenue and Kern Street - Tenant improvements are proposed along the Kern Street side of the structure to re-introduce storefronts along Kern Street. Timing of these improvements is not known.
7. Storm Drain Replacement - The City is replacing the existing storm drain located in the middle of Fulton Mall between Inyo Street and Tuolumne Street.
8. Water Line Replacement - The City is replacing existing water lines within Kern Mall between Federal Alley and Home Run Alley and Mariposa Mall between Federal Alley to Congo Alley.
9. Sewer Line Replacement - The City is replacing existing sewer lines within Kern Mall between Van Ness Avenue and Home Run Alley and within Merced Mall between Van Ness Avenue and Congo Alley.
10. Mariposa Plaza Activation Project - The Mariposa Plaza is proposed to be redesigned to increase the number of community events.

In addition to the development projects in the vicinity of Fulton Mall, there are various development projects proposed beyond the vicinity of Fulton Mall and within Downtown Fresno. These include the following:

11. Van Ness Avenue Pedestrian Crossing at Mariposa Mall - A new signal is proposed along Van Ness Avenue at Mariposa Mall. This pedestrian signal is being funded by the Federal Transit Authority.

12. Bus Rapid Transit Stop - As part of the Bus Rapid Transit program, a bus stop is proposed along Van Ness Avenue at Mariposa Mall. The bus stop is planned to be on a platform in the middle of Van Ness Avenue. Access to the platform would be provided at street level. Funding for this project is being provided by the Federal Transit Authority.

13. High Speed Rail Station - The proposed station is located along the existing Union Pacific railroad tracks between Fresno Street and Tulare Street.

14. Residential Projects - There are numerous other projects proposed or under construction within the community at large, i.e. the Fulton Corridor Specific Plan Area and outside the Fulton Mall Project Study Area. These include, but are not limited to, an approximate 350 total new housing units in various locations in the Cultural Arts District (located north of the Project Study Area) and Chinatown located west of the Project Study Area).

In addition to the development projects that are identified above, the future development of the Downtown Neighborhoods Community Plan (DNCP) and the Fulton Corridor Specific Plan (FCSP), if adopted by the City, is expected to result in a substantial amount of additional development. The DNCP encompasses 7,290 acres and is generally bounded to the east by Chestnut Avenue, to the south by Church Avenue, to the west by Thorne, West, and Marks Avenues, and to the north by State Route 180. The FCSP is within the boundaries of the DNCP. The FCSP encompasses approximately 655 acres and is generally bound to the north by Divisadero Street, to the west by State Route 99, to the south by State Route 41, and to the east by N Street, O Street, and the alley between M and N Streets. Both plans are expected to be fully built out by the year 2035. The anticipated development in both plans are shown in Table 2.

Table 2: Development Potential Within FCSP and DNCP

Land Use	Development (in dwelling units, square feet, acres)		
	FCSP	DNCP (Excluding FCSP)	FCSP + DNCP
Residential (units)	6,293	3,697	9,990
Office (sf)	3,900,000	2,000,000	5,900,000
Retail (sf)	1,600,000	350,000	1,950,000
Industrial (sf)	150,000	2,900,000	3,050,000
Open Conservation (acres)	31	33	64
Source: Impact Sciences 2012.			

Procedural History and Background of Project EIR

The Project was originally identified to be assessed in a Notice of Preparation (NOP) issued in April 2012. That NOP provided that the City intended to prepare an EIR to assess the impacts from the adoption of the proposed Downtown Community Neighborhoods Plan (DCNP), the proposed Fulton Corridor Specific Plan (FCSP), and a Downtown Development Code (collectively "Downtown Plans").

The Project was to be assessed in connection with the review of the FCSP because the FCSP identified revitalizing the Fulton Mall as a top priority. The Advisory Committee for the FCSP selected three options out of ten considered to be further analyzed in the FEIR that would be prepared to adopt the FCSP:

1. Reconnect the Grid on Traditional Streets. (Alternative 1 identified in this IS).
2. Reconnect the Grid with Vignettes. (Alternative 2 identified in this IS).
3. Restoration and Completion of the Mall.[1]

The purpose for the additional study in the EIR was to allow the Council to elect one of the three options when the FCSP was adopted.

The City has determined to prepare an EIR for the Project now, independent of the FCSP or Downtown Plans, for two reasons: (1) because of the City has been awarded Federal grants for the Project which require environmental review to be completed by March 2014 and (2) because it is unlikely or at least, uncertain, that the Downtown Plans and the EIR to review those plans will be brought to Council before the Federal grant timelines run.

In August 2012 the Federal Highway Administration (FHWA) announced the award of $1 million from the Transportation, Community, and System Preservation (TCSP) Program to the City for preconstruction expenses for the Project, and in September 2013 the US Department of Transportation announced that Fresno had been awarded nearly $16 million in Transportation Investments Generating Economic Recovery (TIGER) funding for Project construction expenses.

As a result of receiving the grant awards, the City is required to prepare a NEPA document for the Project, and otherwise treat the project as a federal undertaking by the FHWA (e.g., prepare 4(f) review). Caltrans, the designated agency for FHWA NEPA review, is currently preparing the necessary NEPA documents for the Project.

The TIGER grant requires that obligation of the construction funds must occur no later than September 30, 2014. This means that Caltrans and the FHWA must have approved the project with the fully complete engineering drawings, ready for bid, finalized after the adoption or certification of both federal and state environmental reviews. To meet this deadline, the EIR for the Project will need to be certified by March 2014.

When the NOP was issued in April 2012, it was expected that the DNCP and the FCSP would be brought to Council in 2013. However, delays have occurred for several reasons, not limited to the City needing to find a new environmental consultant as a result of a business disruption of the City's hired consultant that was outside the City's control. Additionally, when the DNCP and FCSP were initiated and first being drafted, the City had not started on the 2035 City of Fresno General Plan. Now that the 2035 General Plan has been drafted and released to the public and the DNCP and FCSP have yet to be approved, the City is currently considering bringing the DCNP and the FCSP to Council after the 2035 General Plan. Based upon all of this, particularly given the many complicated issues

[1] This option will not be considered part of the Project for purposes of this EIR, as it would not qualify for TIGER grant funds. It will be considered as an alternative to the Project in the EIR.

that the FCSP, DNCP, and the updated General Plan must address in preparation for adoption, the City determined that it would be unrealistic to expect the combined FNCP environmental review to be completed in time to meet TIGER deadlines. It is in light of the TIGER grant, therefore, that the City is preparing this new CEQA document, which addresses the Project on its own, and is also focused on the Project as being conditioned on the allowed purposes of the TIGER grant funds.

In considering the preparation of this EIR, the City looked at the issue of whether there was an argument of improper segmentation of the CEQA project in light of the fact that this Project was originally intended to be reviewed in the EIR reviewing the Downtown Plans. After considering the applicable law and the particular facts at issue, the City has determined that preparation of this EIR to consider the Project does not amount to improper segmentation.

Segmentation occurs when the project description does not encompass the *entire* project. The general CEQA principle involved was made in *Bozung v. LAFCO* (1975) 13 Cal.3d 263, 283-84 and recognized as applying to segmentation by the California Supreme Court in *Laurel Heights Improvement Assn. v. Regents of University of Cal. (Laurel Heights I*) (1988(47 Cal.3d 376: There is a CEQA principal that*,* "environmental considerations do not become submerged by chopping a large project into many little ones—each with a minimal potential impact on the environment—which cumulatively may have a disastrous consequences."

In *Laurel Heights I*, the court established a test for when an EIR must include an analysis of the environmental effects of further expansion or other action: if (1) it is a reasonably foreseeable consequence of the initial project; and (2) the future expansion or action will be significant in that it will likely change the scope or nature of the initial project or its environmental effects. Absent both of these elements, the court found that the future action need not be considered in the EIR. Although the future action would need to be considered in a subsequent CEQA analysis before approval.

In *San Joaquin Raptor Society v. County of Stanislaus*, (1994) 27 Cal.App.4th 713, the project description included a subdivision. The record demonstrated that a wastewater treatment plant would be built on a site adjacent to the subdivision to serve the new subdivision. The project description did not include the wastewater treatment plant. The court found this was an inadequate project description and violated CEQA. The court found the EIR segmented the project into two projects, the subdivision and the wastewater treatment plant. The court found that the subdivision was a reasonably foreseeable additional component to the subdivision project because the subdivision could not go forward but for the treatment plant being built. The court recognized that this amounted to an improper segmentation as the EIR would not show the full range and intensity of adverse impacts resulting from the project.

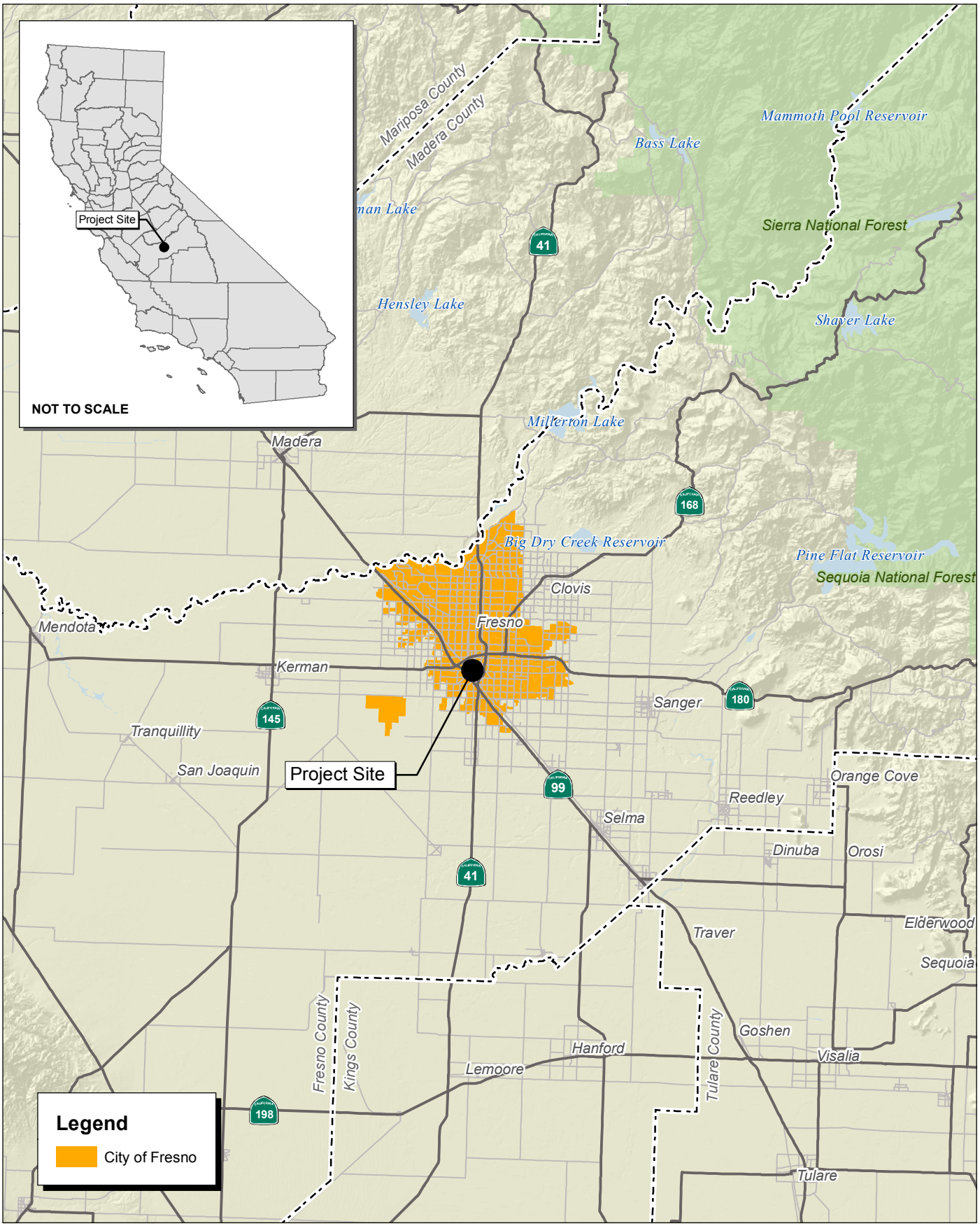
The Downtown Plans do not meet the test under *Laurel Heights I* for future actions requiring review in the EIR being prepared for the Project. Additionally, failure to review the Downtown Plans in the Project's EIR does not violate the principle stated in *Bozung*.

First and foremost, the City is not reviewing the Project separately with an improper intent to avoid looking at or reduce the full range and intensity of identified impacts of the combined approval of

the Project and the Downtown Plans. The Initial Study was prepared, and the EIR will be prepared, to consider the impacts of the Project along with the impacts of the FCSP and the DNCP. Every impact section has considered the cumulative impacts of the adoption of the Downtown Plans, as well as those of the Project.

Second, the Project has independent utility, separate and apart from the adoption of the FCSP. Approval of the Project does not rely on the approval of the FCSP or the DNCP. The Project could go forward if the City never moved further on the adoption of the Downtown Plans, or if the Council considered the Downtown Plans and took formal action to deny adoption of the plans, or even if the Downtown Plans had never been proposed. Additionally, the benefits sought for the Project pursuant to the goals of the TIGER grant funds to revitalize the area can be achieved without adoption of the FCSP and the DNP. That is, the occupation of the buildings in and around the Project area and the development and infill of the Downtown Area are allowed under the current plans. Finally, discussed in the Land Use section of this Initial Study, the Project was analyzed for consistency with the 2025 General Plan, the Central Community Plan and the proposed FCSP and the DNCP.

Finally, the FCSP and the DNCP are not a reasonably foreseeable consequence of the Project. Nothing about this Project is reasonably expected to be a catalyst for the adoption of the FCSP or the Downtown Plans. The Downtown Plans have been in process since January 2010, well before the City had any idea it could or would receive a TIGER grant. The City has spent hundreds of hours and hundreds of thousands of dollars on the Downtown Plans, which cover approximately 7,000 acres. The Project involves less than .01 percent of the area in the Downtown Plans. There is no basis to argue that the Downtown Plans are a reasonably foreseeable consequence of approving the Project.



Source: Census 2000 Data, The CaSIL, MBA GIS 2013.

Michael Brandman Associates

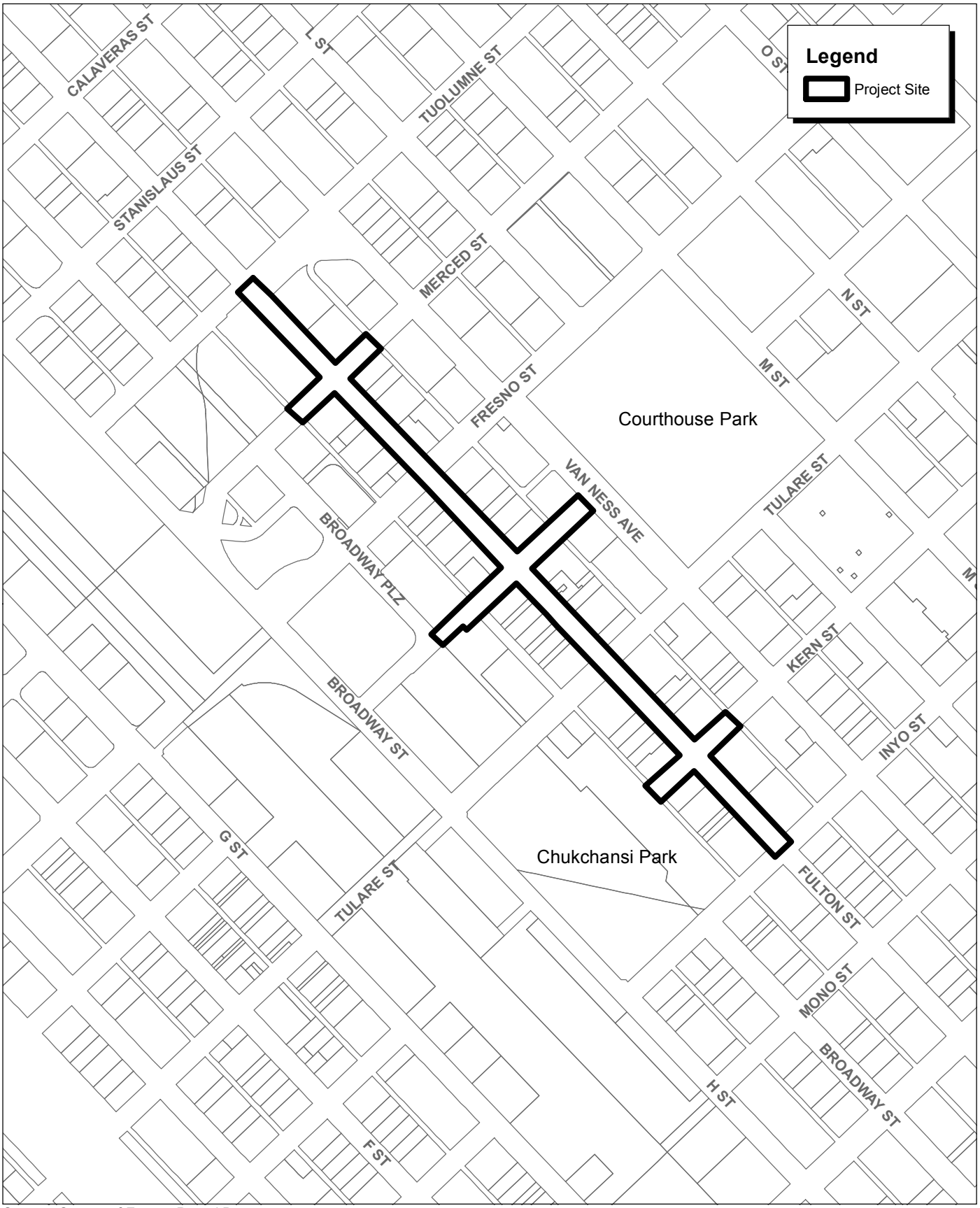
NORTH

10 5 0 10 Miles

Exhibit 1
Regional Vicinity Map

31680020 • 10/2013 | 1_regional.mxd

CITY OF FRESNO • FULTON MALL RECONSTRUCTION PROJECT



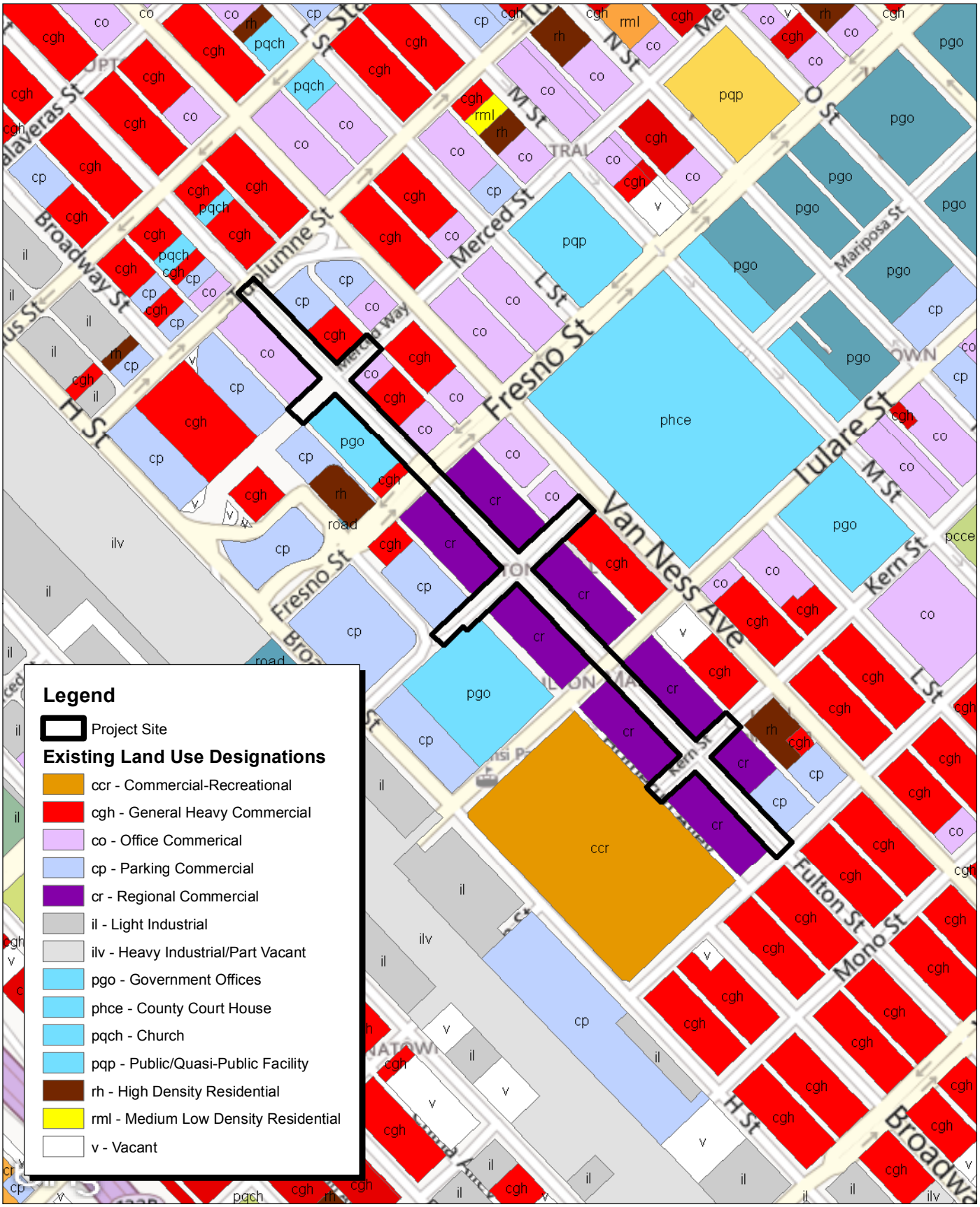
Source: County of Fresno Parcel Data.

Michael Brandman Associates

NORTH

500 250 0 500 Feet

Exhibit 2
Project Site



Source: City of Fresno, Bing Street Map.

Michael Brandman Associates

NORTH

500 250 0 500 Feet

Exhibit 3
Existing Land Use

SECTION 2: ENVIRONMENTAL CHECKLIST

Environmental Factors Potentially Affected					
The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.					
☒	Aesthetics	☐	Agriculture and Forestry Resources	☐	Air Quality
☐	Biological Resources	☒	Cultural Resources	☐	Geology/Soils
☐	Greenhouse Gas Emissions	☐	Hazards/Hazardous Materials	☐	Hydrology/Water Quality
☐	Land Use/Planning	☐	Mineral Resources	☐	Noise
☐	Population/Housing	☐	Public Services	☐	Recreation
☐	Transportation/Traffic	☐	Utilities/Services Systems	☒	Mandatory Findings of Significance

Environmental Determination

On the basis of this initial evaluation:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☐ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☒ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measure based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Date: October 15, 2013 Signed: Elliott Balch

Elliott Balch, Downtown Revitalization Manager

Environmental Issues	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
2.1 - Aesthetics *Would the project:*				
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic building within a state scenic highway?	☐	☐	☐	☒
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☒	☐	☐	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☐	☒
2.2 - Agriculture and Forestry Resources *In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:*				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒

Environmental Issues	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒
2.3 - Air Quality *Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations.* *Would the project:*				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☒	☐
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions, which exceed quantitative thresholds for ozone precursors)?	☐	☐	☒	☐
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☒	☐
2.4 - Biological Resources *Would the project:*				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☐	☒

Environmental Issues	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	☒
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of wildlife nursery sites?	☐	☐	☐	☒
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☒	☐
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒
2.5 - Cultural Resources *Would the project:*				
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☒	☐	☐	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☒	☐	☐
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☒	☐	☐
d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☒	☐	☐
2.6 - Geology and Soils *Would the project:*				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury or death involving:				

Environmental Issues	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☐	☒
ii) Strong seismic ground shaking?	☐	☐	☒	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
iv) Landslides?	☐	☐	☐	☒
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☒	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☒	☐
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	☒
2.7 - Greenhouse Gas Emissions *Would the project:*				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐
b) Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☐	☒
2.8 - Hazards and Hazardous Materials *Would the project:*				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐

Environmental Issues	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☒	☐	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☒	☐
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☒	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☐	☒
2.9 - Hydrology and Water Quality *Would the project:*				
a) Violate any water quality standards or waste discharge requirements?	☐	☒	☐	☐

Environmental Issues	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted?	☐	☐	☒	☐
c) Substantially alter the existing drainage pattern of area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	☐	☐	☐	☒
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	☐	☐	☒	☐
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☒	☐
f) Otherwise substantially degrade water quality?	☐	☐	☒	☐
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☐	☒
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☒	☐
j) Inundation by seiche, tsunami, or mudflow?	☐	☐	☐	☒

Environmental Issues	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
2.10 - Land Use and Planning *Would the project:*				
a) Physically divide an established community?	☐	☐	☐	☒
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☒	☐	☐
c) Conflict with any applicable habitat conservation plan or natural communities conservation plan?	☐	☐	☐	☒
2.11 - Mineral Resources *Would the project:*				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒
2.12 - Noise *Would the project result in:*				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

Environmental Issues	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
2.13 - Population and Housing *Would the project:*				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☒	☐
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
2.14 - Public Services *Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:*				
a) Fire protection?	☐	☐	☐	☒
b) Police protection?	☐	☐	☐	☒
c) Schools?	☐	☐	☐	☒
d) Parks?	☐	☐	☐	☒
e) Other public facilities?	☐	☐	☐	☒
2.15 - Recreation				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☒	☐
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment?	☐	☐	☒	☐

Environmental Issues	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
2.16 - Transportation/Traffic *Would the project:*				
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	☐	☒	☐	☐
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	☐	☐	☐	☒
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☒
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☒	☐
e) Result in inadequate emergency access?	☐	☒	☐	☐
f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	☐	☐	☐	☒
2.17 - Utilities and Service Systems *Would the project:*				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒

Environmental Issues	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒c
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	☒
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☒	☐
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☒	☐
2.18 - Mandatory Findings of Significance				
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☒	☐	☐	☐
c) Does the project have environmental effects, which will cause substantial adverse effects on human beings, either directly or indirectly?	☒	☐	☐	☐

SECTION 3: ENVIRONMENTAL EVALUATION

3.1 - Aesthetics

A Visual Impact Assessment was prepared by FirstCarbon Solutions for the proposed project. The following discussion is based on the Visual Impact Assessment, which is provided in Appendix A of this Initial Study.

The project region is characterized by the relatively flat San Joaquin Valley that rises into the Sierra Nevada Mountains to the northeast and east. The San Joaquin River extends along the north side of the City and County boundary of Fresno and the Madera County boundary. Because of the relatively flat terrain of the valley, views of the high-rise buildings within downtown Fresno can be viewed from great distances in all directions.

In the late 1800s, Fresno began to colonize, and the land use became predominately agricultural. Development began to occur within the downtown area of Fresno subsequent to the construction of the Central Pacific Railroad that extended through the San Joaquin Valley. In the first few decades of the 1900s, development continued to occur within Fresno including major high-rise buildings in the downtown area, where the Fulton Mall was later constructed in the early 1960s.

After several years of stability, by 1970, Downtown Fresno business began to decline due to increasingly rapid growth in northern parts of the City and the opening of the major suburban shopping mall, Fashion Fair. Shortly thereafter, the major and specialty retailers, including iconic department stores such as Gottschalks and JC Penny, left Downtown Fresno, and the Fulton Mall, known for its world class collection of public art, became home to vacant storefronts, empty office buildings, and a small collection of retailers. Today, Fulton Mall is characterized by relatively low levels of retail and other economic activity, it is devoid of any substantial activity on weeknights after 5 p.m., when Downtown's more than 30,000 daytime workers leave Downtown. Vacancies are common among the storefronts and especially in spaces above the ground level along the Mall.

Fulton Mall has a large number of trees, scrubs, and flowers that provide visual relief to the urban environment. Most of the trees do not appear to be well maintained due to the presence of broken or crossing limbs, misshapen trunks, and roots protruding into the concrete sidewalks.

The Mall's pavement is dirty, with numerous areas of food stains, discarded chewing gum, cigarette butts, and cracks. Many planter walls and curbs are also cracked. Some of the sculptures have been vandalized and others are not prominently displayed or identified. The fountains have also been vandalized and many have not be operable for years because plaster is cracked, pumps and/or lighting are inoperable, and the fountains have become repositories for debris, discarded bits of food, and cigarette butts. Many of the vacant storefronts have numerous haphazardly placed flyers, various advertisements, and metal security gates. All of these existing components throughout Fulton Mall greatly reduce the visual quality of the Mall.

Scenic Vista

a) Have a substantial adverse effect on a scenic vista?

Project Impacts

Alternative 1

No impact. Distant views from within the Fulton Mall area are limited due to the surrounding high-rise development and the existing large trees within the Mall. Pedestrians who travel within Fulton Mall have very few locations where distant views are available. These distant views are located on the edges of the Mall and typically along existing streets. Within the Mall, pedestrian views are internal and include the various features of the Mall including trees and shrubs, pavement, planters, sculptures, fountains, seating areas, and other artwork.

The scenic vistas that are located in the Fresno area include views of the San Joaquin River and the Sierra Nevada Mountains. There are no views of the San Joaquin River from the Downtown area since the River is located more than 10 miles to the north. The views of the Sierra Nevada Mountains from Downtown Fresno are substantially impaired in a majority of the Project Area due to the height of the buildings and the limited number of days out of the year when the mountains may be seen (they can only be seen on clear days when the air quality is good). The implementation of the proposed reconstruction of Fulton Mall under Alternative 1 would remove trees and a large number of shrubs and flowers. The removal of the vegetation may minimally increase distant views from the project area. Existing limited views of the Sierra Nevada Mountains will not be adversely impacted by Alternative 1. The implementation of Alternative 1 would not result in impacts on scenic vistas.

Alternative 2

No impact. The determination of no impact on scenic vistas under Alternative 2 would be the same as described under Alternative 1.

Cumulative Impacts

No impact. The implementation of cumulative projects, such as the development proposed as part of the DNCP and FCSP as well as the current developments that are proposed in the Fulton Mall area, may result in increases in building heights and bulk of buildings. These increases could impede the limited distant views of the Sierra Nevada Mountains that are available in the Downtown Area. The cumulative reduction of the limited views could potentially result in significant impacts. However, since the implementation of Alternative 1 or 2 would not contribute to impacts on scenic vistas, the Project would not contribute any impacts to any potential significant cumulative impacts to scenic vistas. Therefore, Alternative 1 or 2 would result in no cumulative impacts.

Scenic Resources within a State Scenic Highway

b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic building within a state scenic highway?

Project Impacts

Alternative 1

No impact. Based on a review of California Department of Transportation mapping of State Scenic Highways (http://www.caltrans.ca.gov/hq/LandArch/scenic_highways/fresno.htm), the County of Fresno does not have officially designated State Scenic Highways. Fresno County has three eligible State Scenic Highways, and the nearest eligible highways are east of the City of Fresno along Highway 180 and east of the City of Clovis along Highway 168. Since there are no officially designated scenic highways in the immediate vicinity of the proposed project, the implementation of Alternative 1 would not damage scenic resources within a state scenic highway.

Alternative 2

No impact. The determination of no impact on scenic resources within a state scenic highway under Alternative 2 would be the same as described above for Alternative 1.

Cumulative Impacts

No impact. Since the County of Fresno does not include any officially designated scenic highways, the implementation of Alternative 1 or 2 would result in no cumulative impacts on scenic resources within a state scenic highway.

Visual Character

c) Substantially degrade the existing visual character or quality of the site and its surroundings?

Trees

There are approximately 154 trees and a large number of shrubs and flowers that provide a visual relief to the urban environment within Fulton Mall. However, by appearance to a user of the Mall, most of the trees do not appear to be well-maintained due to the presence of broken or crossing limbs, misshapen trunks, and roots protruding into the concrete sidewalks. Although not an aesthetic characteristic, the mature trees do provide shade, which is much needed in the warmer months in Fresno.

Storefronts

Views to the storefronts along the public streets that are adjacent to Fulton Mall such as Inyo Street, Tulare Street, Fresno Street, and Tuolumne Street are limited or for a large majority of the store, non-existent. The limited views of storefronts on the Fulton Mall do not allow motorists or pedestrians traveling along Inyo Street, Tulare, Street, Fresno Street, and Tuolumne Street to orient themselves in relation to specific stores within the Mall that are adjacent to these streets. Opening up the Mall to vehicular traffic under Alternative 1 would allow motorist to have direct physical and visual access to the shops since the streets would allow access.

Mall Features

The Mall's pavement includes a paving pattern that resembles the contours of the natural landscape. However, the overall appearance of the Mall is that it is minimally maintained; the pavement is dirty, with numerous areas of food stains, discarded chewing gum, cigarette butts, and the pavement is cracked in many locations. At the time the trees were planted, advanced planting techniques, such as structural pavement, drip irrigation, and root barriers were not prevalent, and therefore, tree roots have cracked the pavement in numerous locations.

Additionally, many planter walls and curbs are cracked, which decrease the quality of the visual environment, and generally give the Mall a visually unattractive appearance. The sculptures and fountains provide unique elements to the Mall; however, some sculptures have been vandalized and others are not prominently displayed or identified.

Additionally, some of the 21 fountains have been vandalized, and 14 of the 21 existing fountains have not been operable for years. Plaster is cracked, and the pumps and/or lighting are inoperable and have become repositories for debris, discarded bits of food, and cigarette butts.

Because of the ground floor vacancies within the Fulton Mall, which is approximately 26 percent, many of the businesses have industrial-looking metal gates that extend across the storefront indicating that the building space is vacant and abandoned. The gates are used to deter vandalism; however, they also detract from the overall visual environment of the Mall.

In addition, there are vacant storefronts that have numerous haphazardly placed flyers, various advertisements, and other posted materials that are attached to their frontage that further degrades the visual experience of visiting the Mall. Although the 154 trees in the Mall provide a visual amenity, the presence of the inoperable fountains that are used as repositories for trash, in addition to dirty and broken sidewalks, metal security gates and numerous flyers at the vacant storefronts greatly reduce the visual quality of the Mall.

Project Impacts

Alternative 1

Potentially significant impact. Implementation of Alternative 1 will result in the alteration of the short-term and long-term visual character of Fulton Mall.

Short-term Visual Alteration

Under Alternative 1, four of the 154 existing trees within the Mall will remain after grading activities are completed. The removal of the existing trees will substantially alter the visual character of Fulton Mall. To reduce this potential visual impact, the following mitigation measures are recommended.

Mitigation Measures

MM AES-1 Trees that are removed shall be replaced with a new tree at a 1:1 ratio within the Fulton Mall right-of- way. The replacement trees shall be consistent with the

landscape palette and design approved by the Parks Director and the Public Works Director.

MM AES-2 Replacement trees to be planted shall be of varying sizes that range from 15 gallon to 36-inch box. Each replacement tree shall have root barriers to prevent sidewalk upheaval from roots.

Although Mitigation Measures AES-1 and AES-2 will be implemented with Alternative 1, the newly planted trees will not provide shade and increase visual appeal until they reach maturity, which may take many years. Because of the time it will take for newly planted trees to reach maturity, the visual alteration of the existing Mall with implementation of Alternative 1 and Mitigation Measures AES-1 and AES-2 above would remain a significant and unavoidable short-term visual impact.

Short-term visual impacts will be further discussed in the forthcoming EIR.

Long-term Visual Alteration
In addition to the removal of existing mature trees that are located throughout Fulton Mall and the replacement of the same number of trees (154 trees) throughout the Mall, Alternative 1 will result in the loss of the original patterned pavement of the Mall. Alternative 1 includes the replacement of the patterned pavement with an asphalt road in the middle of the Mall and new patterned pavement along the sidewalks. The new patterned pavement will replicate the original pavement to maintain the original design. The presence of the asphalt road will alter the long-term visual character within the Mall. This visual alteration will be positive because Alternative 1 will replace the dirty, stained, and cracked pavement that currently decreases the visual quality of the Mall.

The planters throughout the Mall area are also assumed to be removed under Alternative 1. Many of the existing planter walls and associated curbs are cracked and stained. The removal of the planters under Alternative 1 would improve the long-term visual quality of the Mall.

The existing sculptures will be temporarily removed during construction activities under Alternative 1. Some of the existing sculptures have been vandalized. Alternative 1 includes refurbishing the 20 existing sculptures, placing them within the sidewalk areas of Fulton Mall, and prominently identifying them. The refurbishment of the sculptures will improve the long-term visual quality of the Mall under Alternative 1.

Some of the existing fountains will be removed and others will remain during construction activities under Alternative 1. Fourteen of the existing 21 fountains are currently inoperable due to cracks, inoperable pumps, and/or electrical problems affecting the lighting. Many have become repositories for debris, discarded bits of food, and cigarette butts. Alternative 1 will retain the three fountains that are located on Kern Mall west of Fulton. These three fountains will be refurbished. Since many of the fountains are in disrepair, removal of them under Alternative 1 would improve the long-term visual quality of the Mall.

Under Alternative 1, long-term maintenance of the fountains will be provided by the City of Fresno. The City currently provides maintenance of the fountains; however, due to the number and age of the fountains, substantial funding has been needed. Under Alternative 1, fewer fountains will be

included in Fulton Mall, and the existing maintenance funding will be adequate to maintain the refurbished or rebuilt fountains.

There are various existing lighting fixtures throughout the Mall that are inoperable due to lack of maintenance. After dark, the Mall appears to be almost abandoned, since most of the retail stores throughout the Mall are closed in the evening due to the lack of customers and many of the stores are locked with metal gates to prevent burglaries and the lights are turned off. Therefore, in the evening, the Mall has a lack of proper lighting and the nighttime visual experience is of very low quality. Under Alternative 1, the provision of streets within the Mall as well as parking near the retail stores will indirectly increase the number of shoppers in Fulton Mall, thereby increasing revenues, decreasing vacancies, and it would be expected that increased maintenance dollars would be available for upkeep of the Mall landscaping, lighting, and storefronts. New irrigation lines would be provided for landscaping within the Mall, and new electrical wiring would be provided for the light fixtures proposed in the Mall.

A Visual Impact Assessment was prepared for Alternative 1 and is located in Appendix A. The Assessment included a quantitative visual quality evaluation of three key observation points within the Mall. The existing visual quality was compared to the visual quality with the implementation of Alternative 1 by analyzing the physical characteristics and change combined with the expected sensitivities and responses of potential viewer groups. The evaluation identified higher visual quality ratings for each key observation point with Alternative 1 compared to existing conditions. Therefore, the implementation of Alternative 1 would result in a beneficial impact on long-term visual quality. To further provide a beneficial long-term impact, the City of Fresno is recommending the implementation of the following:

Mitigation Measures

Implementation of Mitigation Measures AES-1 and AES-2.

MM AES-3 All crosswalks within the project area shall not use typical white wide hatched lines, but shall include offset color concrete strips similar to other intersections in the vicinity of Fulton Mall such as Kern Street/Van Ness Avenue, Kern Street/L Street, and Inyo Street/Van Ness Avenue.

MM AES-4 Drainage structures such as inlets within the sidewalk areas and the face of the curbs shall be designed to visibly blend-in with the color and tone of the setting.

MM AES-5 Trash receptacles shall blend in with the landscape by including an exterior color that is similar to the patterned pavement of the sidewalk.

MM AES-6 All 20 sculptures would be removed during construction activities. Prior to returning the sculptures, they shall be refurbished, and then located in prominent viewable areas within the Mall.

The implementation of the above mitigation measures will further provide beneficial long-term impacts associated with implementation of Alternative 1 and further ensure any potential impact to aesthetics is less than significant.

Alternative 2

Potentially significant impact. Implementation of Alternative 2 will result in similar alterations of the short-term and long-term visual character of Fulton Mall as Alternative 1. Following is the short-term and long-term visual impact evaluation.

Short-term Visual Alteration

Under Alternative 2, 30 of the 154 existing trees within the Mall will remain after grading activities are completed. The 30 existing trees would remain in the vignette areas. The removal of the remaining existing trees will substantially alter the visual character of Fulton Mall. To reduce this potential visual impact, the following mitigation measures are recommended.

MM AES-1 Trees that are removed shall be replaced with a new tree at a 1:1 ratio within the Fulton Mall right-of- way. The replacement trees shall be consistent with the landscape palette and design approved by the Parks Director and the Public Works Director.

MM AES-2 Replacement trees to be planted shall be of varying sizes that range from 15 gallon to 36-inch box. Each replacement tree shall have root barriers to prevent sidewalk upheaval from roots.

Although Mitigation Measures AES-1 and AES-2 will be implemented with Alternative 2, the newly planted trees will not provide shade and increase visual appeal until they reach maturity, which may take many years. Because of the time it will take for the newly planted trees to reach maturity, the visual alteration of the existing Mall with implementation of Alternative 2 and the above Mitigation Measures AES-1 and AES-2 would remain a significant and unavoidable short-term visual impact.

Short-term visual impacts will be further discussed in the forthcoming EIR.

Long-term Visual Alteration

In addition to the removal of existing mature trees that are located throughout Fulton Mall and the replacement of the same number of trees (154 trees) throughout the Mall, Alternative 2 will result in the loss of the original patterned pavement of the Mall. Alternative 2 includes the replacement of the patterned pavement with an asphalt road in the middle of the Mall, new patterned pavement along the sidewalks, and the vignette areas. Similar to Alternative 1, the new patterned pavement will replicate the original pavement to maintain the original design. The presence of the asphalt road will alter the long-term visual character within the Mall. This visual alteration will be positive because Alternative 2 will replace the dirty, stained, and cracked pavement that currently decreases the visual quality of the Mall.

The planters throughout the Mall area are also assumed to be removed under Alternative 2, and constructed within the vignette areas. Many of the existing planter walls and associated curbs are

cracked and stained. The removal of the planters under Alternative 2 as well as the inclusion of new planters within the vignette areas would improve the long-term visual quality of the Mall.

The existing sculptures will be temporarily removed during construction activities under Alternative 2. The 20 existing sculptures will be refurbished. Fourteen of the 20 sculptures would be returned to approximately the same location as they exist today. The remaining six sculptures would be returned to new locations within the Mall. Each of the sculptures would be prominently displayed and identified. The refurbishment of the sculptures will improve the visual quality of the Mall under Alternative 2.

Some of the existing fountains will be removed and others will remain during construction activities under Alternative 2. As discussed above, 14 of the existing 21 fountains are currently inoperable due to cracks, inoperable pumps, and/or electrical problems affecting the lighting. Many have become repositories for debris, discarded bits of food, and cigarette butts. Alternative 2 will retain 12 of the 21 fountains; three on Kern Mall west of Fulton and nine fountains within the vignette areas. All 12 fountains will be refurbished or rebuilt. Retaining and refurbishing/rebuilding the fountains will improve the long-term visual quality of the Mall under Alternative 2.

Under Alternative 2, long-term maintenance of the fountains will be provided by the City of Fresno. The City currently provides maintenance of the fountains; however, due to the number and age of the fountains, substantial funding has been needed. Under Alternative 2, fewer fountains will be included in Fulton Mall, and the existing maintenance funding will be adequate to maintain the refurbished or rebuilt fountains.

Similar to the discussion of lighting under Alternative 1, the implementation of Alternative 2 would provide for adequate lighting and improve the nighttime visual quality of Fulton Mall.

As described above for Alternative 1, a Visual Impact Assessment was also prepared for Alternative 2 and is also located in Appendix A. The Assessment included a quantitative visual quality evaluation of key observation points within the Mall. The existing visual quality was compared to the visual quality with the implementation of Alternative 2 by analyzing the physical characteristics and change combined with the expected sensitivities and responses of potential viewer groups. The evaluation identified higher visual quality ratings for each key observation point with Alternative 2 compared to existing conditions. Therefore, the implementation of Alternative 2 would result in a beneficial impact on long-term visual quality. To further provide a beneficial long-term impact, the City of Fresno is recommending the implementation of the following measures.

Implementation of Mitigation Measures AES-1 and AES-2, and the following mitigation measures:

MM AES-3 All crosswalks within the project area shall not use typical white wide hatched lines, but shall include offset color concrete strips similar to other intersections in the vicinity of Fulton Mall such as Kern Street/Van Ness Avenue, Kern Street/L Street, and Inyo Street/Van Ness Avenue.

MM AES-4 Drainage structures such as inlets within the sidewalk areas and the face of the curbs shall be designed to visibly blend-in with the color and tone of the setting.

MM AES-5 Trash receptacles shall blend in with the landscape by including an exterior color that is similar to the patterned pavement of the sidewalk.

MM AES-6 Subsequent to removal of all 20 sculptures during construction activities, 14 of the 20 sculptures shall be returned to their approximate current location. The six remaining sculptures shall be return to a new location within the Mall. Prior to returning the sculptures, they shall be refurbished and then located in prominent viewable areas within the Mall.

MM AES-7 The roadway pavement within the vignette areas shall include integrally colored concrete with a similar tone as the proposed sidewalk.

MM AES-8 The new location of the Clock Tower is planned in the center of the proposed roundabout at the intersection of Fulton Street and Mariposa Street. To increase the visual prominence of this feature, it is recommended that the Clock Tower be raised approximately 2 to 3 feet in height onto a base that includes a planter. The planter will require irrigation lines and maintenance of the planter base and the vegetation within the planter will be provided by the City of Fresno. To ensure safety of maintenance workers, the planter base shall be designed with a raised step around the planter. The size of the base shall be determined by the City of Fresno based on the lane width requirements of the roundabout. The material that is used for the base shall be determined by the City of Fresno and the color and tone of the material shall be consistent with the color of the patterned pavement on the sidewalk. Raising the Clock Tower feature will also reduce the potential for motorist accidentally hitting the Clock Tower.

The implementation of the above mitigation measures will further provide beneficial long-term impacts associated with implementation of Alternative 2 and further ensure any potential impact to aesthetics is less than significant.

Cumulative Impacts

Potentially significant impact.

Short-term

The implementation of cumulative development within the Downtown Fresno area could alter the existing visual characteristics. This alteration could occur through the implementation of the proposed DNCP and FCSP as well as current development projects in the Fulton Mall area. Since the implementation of Alternatives 1 and 2 will result in a short-term significant and unavoidable impact on the existing visual quality of Fulton Mall, Alternatives 1 and 2 could contribute to significant cumulative impacts on the existing visual quality of Downtown Fresno. The contribution is considered to be considerable and significant. The following mitigation measures are recommended to reduce the short-term visual quality impacts.

MM AES-1 Trees that are removed shall be replaced with a new tree at a 1:1 ratio within the Fulton Mall right-of- way. The replacement trees shall be consistent with the landscape palette and design approved by the Parks Director and the Public Works Director.

MM AES-2 Replacement trees to be planted shall be of varying sizes that range from 15 gallon to 36-inch box. Each replacement tree shall have root barriers to prevent sidewalk upheaval from roots.

Although Mitigation Measures AES-1 and AES-2 will be implemented with Alternatives 1 and 2, these alternatives would still substantially contribute to short-term visual quality impacts until the newly planted trees reach maturity. Therefore, Alternatives 1 and 2 would continue to contribute significant short-term visual quality impacts even after implementing the above mitigation measures.

Short-term cumulative visual impacts will be further discussed in the forthcoming EIR.

Long-term
The implementation of cumulative development within the Downtown Fresno area could alter the existing long-term visual characteristics. This alteration could be significant due to the substantial amount of development that is planned as part of the DNCP and FCSP that include 9,990 residential units, 5.9 million square feet (msf) of office, 1.95 msf of retail, 3.05 msf of industrial, and 64 acres of open conservation. The cumulative long-term alteration of the visual characteristics could be significant.

The implementation of the proposed Fulton Mall Reconstruction project under Alternatives 1 and 2 would result in a beneficial impact on long-term visual quality as described above. Since beneficial long-term visual quality impacts would occur, the implementation of Alternatives 1 and 2 would not contribute to the potential significant cumulative long-term visual quality impacts. Therefore, Alternatives 1 and 2 would result in no adverse cumulative long-term visual quality impacts.

Light and Glare

d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

There are various existing lighting fixtures throughout the Mall that are inoperable due to lack of maintenance. After dark, the Mall appears to be almost abandoned, since most of the retail stores throughout the Mall are closed in the evening due to the lack of customers and many of the stores are locked with metal gates to prevent burglaries and the lights are turned off. Therefore, in the evening, the Mall has a lack of proper lighting.

Project Impacts

Alternative 1

No impact. Under Alternative 1, new lighting fixtures and new electrical wiring will be provided along the proposed streets within the Mall. The increase in lighting from the light fixtures as well as lighting from nighttime motorist activity will provide a beneficial lighting impact in the Mall. This

beneficial impact would occur because the provision of streets within the Mall as well as parking near the retail stores will indirectly increase the number of shoppers in Fulton Mall, thereby increasing revenues, decreasing vacancies. The increase in lighting in Fulton Mall will provide a safer shopping experience and result in a beneficial lighting impact. There are no existing residences that are located along the ground floors of Fulton Mall. The nearest existing residents are located in the upper floors (above the 10th floor) of the Pacific Southwest Building. These residents will not be impacted by lighting within Fulton Mall. Therefore, implementation of Alternative 1 would result in no adverse impact.

Alternative 2

No impact. The determination of no adverse lighting impact under Alternative 1 would be the same as described above for Alternative 2.

Cumulative Impacts

No impact. The implementation of cumulative development within the Downtown Fresno area could increase the amount of lighting. Increases in some areas of Downtown Fresno that currently have a deficient amount of lighting could result in a beneficial impact. There could be other areas in Downtown Fresno that currently has adequate amount of lighting and additional development may increase the amount of lighting and could cause adverse impacts on light sensitive land uses such as residences. Overall, cumulative development has the potential to result in significant cumulative lighting impacts. As discussed above, the implementation of Alternatives 1 and 2 will provide lighting in an area of Downtown Fresno that currently has deficient lighting. Alternatives 1 and 2 will result in beneficial lighting impacts and will not contribute to cumulative significant adverse lighting impacts. Therefore, Alternatives 1 and 2 would result in no cumulative adverse lighting impacts.

3.2 - Agriculture and Forestry Resources

Convert Farmland to Non-Agricultural Use

a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?

Based on a review of the California Important Farmland Finder provided by the California Department of Conservation at website: http://maps.conservation.ca.gov/ciff/ciff.html, the Fulton Mall site is classified as Urban and Built-Up Land, which is not considered a sensitive soils for farmland.

Project Impacts

Alternative 1

No impact. Since the Fulton Mall site is not located in an area with land designated as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, the implementation of Alternative 1 would not convert these sensitive farmland areas, therefore, Alternative 1 would not impact these sensitive farmland areas.

Alternative 2

No impact. The determination of no impact to land designated as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance as described for Alternative 1 above would be the same for Alternative 2.

Cumulative Impacts

No impact. Based on a review of the California Important Farmland Finder provided by the California Department of Conservation at website: http://maps.conservation.ca.gov/ciff/ciff.html, the portion of the City of Fresno that is located within Downtown Fresno, such as within the DNCP and FCSP, does not have land that is designated as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance. Therefore, cumulative development within Downtown Fresno would not result in the conversion of land classified as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance. Since Downtown Fresno as well as the project site does not have sensitive farmland areas, the implementation of Alternative 1 or 2 would result in no cumulative impact on sensitive farmland.

Conflict with Existing Zoning or Williamson Act Contract

b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?

Based on a review of the City of Fresno Zoning Map as provided as a download on the City's website: http://www.fresno.gov/Government/DepartmentDirectory/InformationServices/GIS/Layers.htm, the Fulton Mall is located in an area designated as C-4, Central Trading. The Fulton Mall is not zoned for agricultural use, nor is the project site under a Williamson Act contract as shown in the City of Fresno General Plan Map Atlas (Williamson Act Property in the Fresno area) on page 30 on the City's website at http://www.fresno.gov/NR/rdonlyres/243E6033-9A3A-46A5-971B-E5FC7A2775EA/0/MapAtlasFinalVersionSept12011.pdf.

Project Impacts

Alternative 1

No impact. Based on a review of the City's Zoning Map as well as the Williamson Act Property map as described above, there are no lands within Downtown Fresno that includes the DNCP and FCSP that are currently zone for agriculture or currently under a Williamson Act contract. Therefore, implementation of Alternative 1 would not conflict with an existing agricultural use or conflict with a Williamson Act contract. Therefore, Alternative 1 would not impact existing agricultural zoning or a Williamson contract.

Alternative 2

No impact. The determination of no impact regarding a conflict with existing zoning for agricultural use, or Williamson Act contract as described above for Alternative 1 would be the same for Alternative 2.

Cumulative Impacts

No impact. Based on a review of the City of Fresno Zoning Map and the City's Williamson Act lands for Downtown Fresno including the DNCP and FCSP, there are no lands that are zoned for an agricultural use or contain a Williamson Act contract. Therefore, cumulative development within Downtown Fresno would not result in a conflict with an existing agricultural use or conflict with a Williamson Act contract. Since Downtown Fresno as well as the project site does not have lands that are zoned for agriculture or are under a Williamson Act, the implementation of Alternative 1 or 2 would result in no cumulative impact on agricultural zoned land or Williamson Act land.

Conflict with Zoning or Rezoning of Forest Land or Timberland

c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?

The PRC section 12220(g) defines forest land as ". . .land that can support 10 percent native tree cover of any species, including hardwoods, under natural conditions, and that allows for management of one or more forest resources, including timber, aesthetics, fish and wildlife, biodiversity, water quality, recreation, and other public benefits"; additionally, timberland is defined by PRC 4526 as land ". . .which is available for, and capable of, growing a crop of trees of any commercial species used to produce lumber and other forest products." Based on a review of the City of Fresno Zoning Map as provided as a download on the City's website: http://www.fresno.gov/Government/DepartmentDirectory/InformationServices/GIS/Layers.htm, the Fulton Mall is located in an area designated as C-4, Central Trading, which does not allow for forest land or timberland.

Project Impacts

Alternative 1

No impact. Based on the City of Fresno's current zoning of the Fulton Mall area as C-4, Central Trading, the implementation of Alternative 1 would not conflict with forest land or timberland. Therefore, Alternative 1 would result in no impacts on forest land or timberland.

Alternative 2

No impact. The determination of no impact on forest land or timberland as described above for Alternative 1 would be the same for Alternative 2.

Cumulative Impacts

No impact. Based on a review of the City of Fresno Zoning Map for Downtown Fresno including the DNCP and FCSP, there are no lands that are zoned for forest land or timberland. Therefore, cumulative development within Downtown Fresno would not result in a conflict with an area currently zoned for forest land or timberland. Since Downtown Fresno as well as the project site does not have lands that are zoned for forest land or timberland, the implementation of Alternative 1 or 2 would result in no cumulative impact on lands that are zoned for forest land or timberland.

Loss or Conversion of Forest Land

d) Result in the loss of forest land or conversion of forest land to non-forest use?

Refer to Impact 3.2 c) above for a discussion of forest land.

Project Impacts

Alternative 1

No impact. As described in CEQA Checklist Question 3.2 c) above, the project site is not currently zoned for forest land and based on a site visit on April 3, 2013, there are no forest land or timberland that exist on the project site. Therefore, implementation of Alternative 1 would result in no impacts to forest land.

Alternative 2

No impact. The determination of no impacts to forest land as described above for Alternative 1 would be the same for Alternative 2.

Cumulative Impacts

No impact. As described in CEQA Checklist Question 3.2 c) above for cumulative impacts, cumulative development within Downtown Fresno would not impact forest land. Since forest land would not be impacted by cumulative development as well as Alternative 1 or 2, the implementation of Alternatives 1 or 2 would result in no cumulative impact on forest land.

Conversion to Non-Agricultural or Non-Forest Use

e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?

Based on a site visit on April 3, 2013, the Fulton Mall does not contain existing farmland or forest land. Furthermore, there are no farmlands or forest land in the vicinity of Fulton Mall.

Project Impacts

Alternative 1

No impact. Since there are no existing farmlands or forest land within or in the vicinity of Fulton Mall, the implementation of Alternative 1 would not involve changes to existing farmland or forest land. Therefore, Alternative 1 would not impact existing farmland or forest land.

Alternative 2

No impact. The determination of no impact on existing farmland or forest land as described above for Alternative 1 would be the same for Alternative 2.

Cumulative Impacts

No impact. The implementation of Alternatives 1 or 2 would not contribute to any conversion of agricultural land or forest land. Therefore, the implementation of Alternatives 1 or 2 would result in no cumulative impacts on agricultural land or forest land.

3.3 - Air Quality

An Air Quality Study was prepared by FirstCarbon Solutions for the proposed project. The following discussion is based on the Air Quality Study, which is provided in Appendix B of this Initial Study.

Physical Setting

The Project is located in the City of Fresno, in Fresno County, in the San Joaquin Valley Air Basin (Air Basin). The Air Basin consists of Kings Madera, San Joaquin, Merced, Stanislaus, and Fresno counties; as well as a portion of Kern County. The local agency with jurisdiction over air quality in the Basin is the San Joaquin Valley Air Pollution Control District (SJVAPCD). Regional and local air quality is impacted by topography, dominant airflows, atmospheric inversions, location, and season.

Regional Air Quality

The information in this section is primarily from the SJVAPCD's Guide for Assessing and Mitigating Air Quality Impacts and the accompanying Technical Document (San Joaquin Valley Air Pollution Control District 2002).

The Air Basin has an "inland Mediterranean" climate and is characterized by long, hot, dry summers and short, foggy winters. Sunlight can be a catalyst in the formation of some air pollutants (such as ozone); the Air Basin averages over 260 sunny days per year.

The Air Basin is generally shaped like a bowl. It is open in the north and is surrounded by mountain ranges on all other sides. The Sierra Nevada mountains are along the eastern boundary (8,000 to 14,000 feet in elevation), the Coast Ranges are along the western boundary (3,000 feet in elevation), and the Tehachapi Mountains are along the southern boundary (6,000 to 8,000 feet in elevation).

Dominant Airflow

Dominant airflows provide the driving mechanism for transport and dispersion of air pollution. The mountains surrounding the Air Basin form natural horizontal barriers to the dispersion of air contaminants. The wind generally flows south-southeast through the valley, through the Tehachapi Pass and into the Southeast Desert Air Basin portion of Kern County. As the wind moves through the Air Basin, it mixes with the air pollution generated locally, generally transporting air pollutants from the north to the south in the summer and in a reverse flow in the winter.

Inversions

Generally, the temperature of air decreases with height, creating a gradient from warmer air near the ground to cooler air at elevation. This gradient of cooler air over warm air is known as the environmental lapse rate. Inversions occur when warm air sits over cooler air, trapping the cooler air

near the ground. These inversions trap pollutants from dispersing vertically, and the mountains surrounding the San Joaquin Valley trap the pollutants from dispersing horizontally. Strong temperature inversions occur throughout the Air Basin in the summer, fall, and winter. Daytime temperature inversions occur at elevations of 2,000 to 2,500 feet above the San Joaquin Valley floor during the summer and at 500 to 1,000 feet during the winter.

The result is a relatively high concentration of air pollution in the valley during inversion episodes. These inversions cause haziness, which in addition to moisture may include suspended dust, a variety of chemical aerosols emitted from vehicles, particulates from wood stoves, and other pollutants. In the winter, these conditions can lead to CO "hot-spots" along heavily traveled roads and at busy intersections. During summer's longer daylight hours, stagnant air, high temperatures, and plentiful sunshine provide the conditions and energy for the photochemical reaction between ROG and NO_x, which results in the formation of ozone.

Location and Season

Because of the prevailing daytime winds and time-delayed nature of ozone, concentrations are highest in the southern portion of the Air Basin, such as around Bakersfield. Summers are often periods of hazy visibility and occasionally unhealthful air, while winter air quality impacts tend to be localized and can consist of (but are not exclusive to) odors from agricultural operations; soot or smoke around residential, agricultural, and hazard-reduction wood burning; or dust near mineral resource recovery operations.

Emissions Inventory

Background

An emissions inventory is an account of the amount of air pollution generated by various emissions sources. To estimate the sources and quantities of pollution, ARB, in cooperation with local air districts, other government agencies, and industry, maintains an inventory of California emission sources. Sources are subdivided into the four major emission categories: mobile, stationary, area-wide, and natural sources.

Mobile sources include on-road sources and off-road mobile sources. The on-road emissions inventory, which includes automobiles, motorcycles, and trucks, is based on an estimation of population, activity, and emissions of the on-road motor vehicles used in California. The off-road emissions inventory is based on an estimate of the population, activity, and emissions of various off-road equipment, including recreational vehicles, farm and construction equipment, lawn and garden equipment, forklifts, locomotives, commercial marine ships, and marine pleasure craft.

Stationary sources are large, fixed sources of air pollution, such as power plants, refineries, and manufacturing facilities. Stationary sources also include aggregated point sources. These include many small point sources, or facilities, that are not inventoried individually but are estimated as a group and reported as a single-source category. Examples include gas stations and dry cleaners. Each of the local air districts estimates the emissions for the majority of stationary sources within its jurisdiction. Stationary source emissions are based on estimates made by facility operators and local air districts. Emissions from specific facilities can be identified by name and location.

Area-wide sources include source categories associated with human activity that take place over a wide geographic area. Emissions from area-wide sources may be either from small, individual sources, such as residential fireplaces, or from widely distributed sources that cannot be tied to a single location, such as consumer products, and dust from unpaved roads or farming operations (such as tilling).

Natural, or non-anthropogenic, sources include source categories with naturally occurring emissions such as geogenic (e.g., petroleum seeps), wildfires, and biogenic emissions from plants.

Emissions Inventory

The 2008 emissions inventory for the Fresno County portion of the Air Basin is available in ARB's 2009 Almanac Emission Projection Data. In the Project area, mobile emissions are the primary source of local pollution, accounting for approximately 63 percent of CO, 79 percent of oxides of nitrogen (NO_x), and 21 percent of reactive organic gases (ROG). For PM_{10} and $PM_{2.5}$, the majority of emissions are generated by area sources. Table 3 summarizes the estimated 2008 emissions for the main pollutants of concern in the area.

Table 3: 2008 Inventory Fresno County

Emission Category	Tons per Day				
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$
Stationary Sources	16.7	8.9	16.6	4.2	2.9
Area-wide Sources	36.3	110.3	6.9	72.0	21.7
Mobile Sources	30.6	232.0	88.9	4.4	3.7
Natural Sources	63.9	14.6	0.5	1.5	1.3
Total	147.4	365.9	112.9	82.1	29.5
Source: ARB 2013.					

Local Air Quality

Climate and Meteorology

The Fresno meteorological station is located in the Project vicinity. Weather data from this station shows an annual average temperatures in the area from an average monthly high of 98.3 degrees Fahrenheit (ºF) in June to an average monthly low of 37.3 ºF in December and January. The average annual rainfall in the Project area, as recorded between 1948 and 2013, is 10.89 inches (WRCC 2013).

Air Quality

The local air quality can be evaluated by reviewing relevant air pollution concentrations near the Project area. The SJVAPCD operates an air monitoring station on Drummond Street, located south of East Jenson Avenue Bypass between Maple Avenue and Chestnut Avenue, approximately 3.2 miles southeast of the Project. The Drummond Street ambient air monitoring station (Drummond Station) measures 1 hour and 8-hour ozone, daily PM_{10}, 8-hour CO, and 1-hour NO_2. As CO is a highly

localized pollutant, the data from the Drummond station would not be applicable to the Project area. The North 1st Street and Garland Avenue monitoring stations measure PM2.5 and are located approximately 3.5 miles northeast of the project site. The North 1st Street monitoring station was recently closed and replaced by the Garland Avenue monitoring station. Table 4 summarizes 2010 through 2010 published monitoring data from ARB's Aerometric Data Analysis and Management System (iADAM) for the Drummond Station, North 1st Station, and Garland Avenue Station. The PM2.5 measurements for 2010 and 2011 are from the North 1st Station, and the 2012 measurement is from the Garland Station.

Table 4: Air Quality Monitoring Summary

Air Pollutant	Averaging Time	Metric	Year		
			2010	2011	2012
Ozone	1 Hour	Max 1 Hour (ppm)	0.108	0.129	0.127
		Days > CAAQS (0.09 ppm)	5	27	9
	8 Hour	Max 8 Hour (ppm)[1]	0.092	0.105	0.108
		Days > CAAQS (0.07 ppm)	24	73	75
		Days > NAAQS (0.075 ppm)	13	52	46
Particulate matter (PM_{10})	24 Hour	Federal Annual Average (µg/m^3)	26.9	31.4	42.9
		Max 24 Hour (µg/m^3)	66.5	91.3	114.3
		Est. Days > CAAQS (50 µg/m^3)	*	72.0	*
		Est. Days > NAAQS (150 µg/m^3)	*	0.0	*
Fine particulate matter ($PM_{2.5}$)	Annual	Annual Average (µg/m^3)	13.0	15.4	14.0
	24 Hour	Max 24 Hour (µg/m^3)[2]	62.0	78.5	88.8
		Est. Days > National Standard (35 µg/m^3)	21.7	39.0	29.4
Carbon monoxide (CO)	8 Hour	Max 8 Hour (ppm)	1.45	1.73	*
		Days > State Standard (9.0 ppm)	0	0	0
		Days > National Standard (9 ppm)	0	0	0
Nitrogen dioxide (NO_2)	Annual	Annual Average (ppm)	*	0.013	*
	1 Hour	Max 1 Hour (ppm)	0.062	0.069	*
		Days > State Standard (0.18 ppm)	0	0	0

Abbreviations:
> = exceed ppm = parts per million µg/m^3 = micrograms per cubic meter
* = Insufficient/No Data Max = maximum Est. = Estimated
CAAQS = California ambient air quality standards
NAAQS = National ambient air quality standards
[1] From the California Measurement
[2] Federal Annual Average
Source: ARB 2013.

Local Sources of Air Pollution
The adjacent land uses are dominated by commercial, retail development, and government facilities, which generate mobile and area source emissions. State Route 99 is located approximately 0.4 mile west of the Project's western terminus. State Route 41 is located approximately 0.3 mile south and southeast of the project's southern terminus.

Sensitive Receptors
Those individuals who are sensitive to air pollution include children, the elderly, and persons with pre-existing respiratory or cardiovascular illness. The SJVAPCD considers a sensitive receptor to be a location that houses or attracts children, the elderly, people with illnesses, or others who are especially sensitive to the effects of air pollutants. Examples of sensitive receptors include hospitals, residences, convalescent facilities, and schools. There are three apartment buildings in the vicinity of the project. The residential locations the Masten Towers, Hotel Californian, and the Pacific Southwest Building.

- **Masten Towers** is located at the northeast corner of Fresno Street and Broadway Street includes 200 units with one bedroom and studio apartments. Ten percent of the apartments (20 units) accommodate persons with physical disabilities (Masten Towers 2013).
- The **Hotel Californian** is at the southwest corner of Kern Street and Van Ness Avenue has 217 rooms. Currently, the building provides housing for low-income seniors (Balch 2013).
- The **Pacific Southwest Building** is located at the southeast corner of Mariposa Mall and Fulton Mall accommodates approximately 12 people in 8 units. Currently, the housing is provided to above moderate income persons. Residential units are located on the 10th floor and greater (Balch 2013).

Air Quality Plan

a) Conflict with or obstruct implementation of the applicable air quality plan?

Air pollutants are regulated at the national, State, and air basin level; each agency has a different degree of control. The United States Environmental Protection Agency (EPA) regulates at the national level. The California Air Resources Board (ARB) regulates at the state level. The San Joaquin Valley Air Pollution Control District (SJVAPCD) regulates at the regional level.

Criteria Pollutants

Federal and State
The EPA is responsible for global, international, national, and interstate air pollution issues and policies. The EPA sets national vehicle and stationary source emission standards, oversees approval of all State Implementation Plans (SIP), provides research and guidance for air pollution programs, and sets National Ambient Air Quality Standards (NAAQS), also known as federal standards. There are NAAQS for six common air pollutants, called criteria air pollutants, which were identified from provisions of the Clean Air Act (CAA) of 1970. The criteria pollutants are:

- Ozone
- Particulate matter (PM_{10} and $PM_{2.5}$)
- Nitrogen dioxide
- Carbon monoxide (CO)
- Lead
- Sulfur dioxide

The NAAQS were set to protect public health, including that of sensitive individuals; thus, the standards continue to change as more medical research is available regarding the health effects of the criteria pollutants.

The SIP for the State of California is administered by ARB, which has overall responsibility for statewide air quality maintenance and air pollution prevention. A SIP is prepared by each state describing existing air quality conditions and measures that will be followed to attain and maintain NAAQS. The SIP incorporates individual federal attainment plans for regional air districts. Federal attainment plans prepared by each air district are sent to ARB to be approved and incorporated into the California SIP. Federal attainment plans include the technical foundation for understanding air quality (e.g., emission inventories and air quality monitoring), control measures and strategies, and enforcement mechanisms.

ARB also administers California Ambient Air Quality Standards (CAAQS) for the ten air pollutants designated in the California Clean Air Act (CCAA). The ten state air pollutants are the six criteria pollutants listed above as well as visibility reducing particulates, hydrogen sulfide, sulfates, and vinyl chloride. The national and state ambient air quality standards are summarized in Table 5.

Table 5: National and California Ambient Air Quality Standards

Air Pollutant	Averaging Time	California Standard	National Standard
Ozone	1-hour	0.09 ppm	—
	8-hour	0.070 ppm	0.075 ppm
Particulate matter (PM_{10})	24-hour	50 µg/m^3	150 µg/m^3
	Mean	20 µg/m^3	—
Particulate matter ($PM_{2.5}$)	24-hour	—	35 µg/m^3
	Mean	12 µg/m^3	15.0 µg/m^3
Carbon monoxide (CO)	1-hour	20 ppm	35 ppm
	8-hour	9.0 ppm	9 ppm
Nitrogen dioxide (NO_2)	1-hour	0.18 ppm	0.100 ppm
	Mean	0.030 ppm	0.053 ppm
Sulfur dioxide (SO_2)	1-hour	0.25 ppm	0.075 ppm
	24-hour	0.04 ppm	—
	3-hour		0.5 ppm

Table 5 (cont.): National and California Ambient Air Quality Standards

Air Pollutant	Averaging Time	California Standard	National Standard
Lead	30-day	1.5 µg/m^3	—
	Quarter	—	1.5 µg/m^3
	Rolling 3-month average	—	0.15 µg/m^3
Hydrogen sulfide	1-hour	0.03 ppm	—
Sulfates	24-hour	25 µg/m^3	—
Vinyl chloride[1]	24-hour	0.010 ppm	—

Notes:
[1] The ARB has identified vinyl chloride as toxic air contaminant (TAC) with no threshold level of exposure for adverse health effects. Therefore, the vinyl chloride the standard is not a threshold but is the minimum detectable limit. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.
Abbreviations:
ppm = parts per million (concentration) µg/m^3 = micrograms per cubic meter
Mean = Annual Arithmetic Mean 30-day = 30-day average Quarter = Calendar year quarter
Source: SJVAPCD, 2013.

The EPA and the ARB designate air basins where ambient air quality standards are exceeded as "nonattainment" areas. If standards are met, the area is designated as an "attainment" area. If there is inadequate or inconclusive data to make a definitive attainment designation, they are considered "unclassified." Each standard has a different definition, or 'form' of what constitutes attainment, based on specific air quality statistics. For example, the Federal 8-hour CO standard is not to be exceeded more than once per year; therefore, an area is in attainment of the CO standard if no more than one 8-hour ambient air monitoring values exceeds the threshold per year. In contrast, the Federal annual $PM_{2.5}$ standard is met if the three-year average of the annual average $PM_{2.5}$ concentration is less than or equal to the standard.

In addition to attainment designations, the EPA and ARB further classify ozone and PM nonattainment areas based on the severity of the air pollution monitoring, based on the deviation from the respective standard. Federal ozone nonattainment areas are further designated as marginal, moderate, serious, severe, or extreme as a function of deviation from standards. Federal PM_{10} areas are further classified as serious or moderate. ARB classifies 1-hour ozone nonattainment areas as marginal, moderate, serious, severe, or extreme.

California Regulations and Guidance

Caltrans

The California Department of Transportation (Caltrans) has prepared multiple guidance documents to assist in air quality and transportation conformity analyses. A primary source of guidance is the Standard Environmental Reference (SER), which is an on-line guidance document to assist state and location agency staff to plan, prepare, submit and evaluate environmental documents for

transportation projects. SER Chapter 11 contains specific guidance for air quality analysis, as well as references to state and federal analysis requirements and links to other resource documents.

Toxic Air Contaminant Regulations

ARB's Toxic Air Contaminant (TAC) program traces its beginning to the criteria pollutant program in the 1960s. For many years, the criteria pollutant control program has been effective at reducing TACs, since many volatile organic compounds and PM constituents are also TACs. During the 1980s, the public's concern over toxic chemicals heightened. As a result, citizens demanded protection and control over the release of toxic chemicals into the air. In response to public concerns, the California legislature enacted the Toxic Air Contaminant Identification and Control Act governing the release of TACs into the air. This law charges ARB with the responsibility for identifying substances as TACs, setting priorities for control, adopting control strategies, and promoting alternative processes. ARB has designated almost 200 compounds as TACs. Additionally, ARB has implemented control strategies for a number of compounds that pose high health risk and show potential for effective control.

In July 2001, ARB approved an Air Toxic Control Measure for construction, grading, quarrying and surface mining operations to minimize NOA emissions. The regulation requires application of best management practices to control fugitive dust in areas known to have NOA, as well as requiring notification to the local air district prior to commencement of ground-disturbing activities.

ARB approved a regulatory measure to reduce emissions of toxics and criteria pollutants by limiting idling of heavy-duty diesel vehicles. The driver of any vehicle subject to this section (1) shall not idle the vehicle's primary diesel engine for greater than 5 minutes at any location and (2) shall not idle a diesel-fueled auxiliary power system for more than 5 minutes to power a heater, air conditioner, or any ancillary equipment on the vehicle if it has a sleeper berth and the truck is located within 100 feet of a restricted area (homes and schools).

ARB's Land Use Handbook

ARB adopted the Air Quality and Land Use Handbook: A Community Health Perspective (Land Use Handbook) in 2005. The Land Use Handbook provides information and guidance on siting sensitive receptors in relation to sources of TACs. The sources of TACs identified in the Land Use Handbook are high-traffic freeways and roads, distribution centers, rail yards, ports, refineries, chrome plating facilities, dry cleaners, and large gasoline dispensing facilities. If a project involves siting a sensitive receptor or source of TAC discussed in the Land Use Handbook, siting mitigation may be added to avoid potential land use conflicts, thereby reducing the potential for health impacts to the sensitive receptors (ARB 2005). The Project would not construct a source of TACs or a location of sensitive receptors.

San Joaquin Valley Air Pollution Control District

The Project is within the San Joaquin Valley Air Basin, which is under the jurisdiction of the San Joaquin Valley Air District (SJVAPCD). The SJVAPCD is responsible for controlling emissions, primarily from stationary sources. The SJVAPCD maintains an air quality monitoring stations throughout Fresno County. The SJVAPCD, in coordination with the Council of Governments and Association of Governments (including Fresno COG), is also responsible for developing, updating, and

implementing the Air Quality Attainment Plan for the area. In 2002, the SJVAPCD adopted the Guide for Assessing and Mitigating Air Quality Impacts, which details the recommended environmental setting, impacts discussions, and significance thresholds to be applied to projects in the SJVAB.

Attainment Status
The current attainment designations for the SJVAB are shown in Table 6. The area is designated as nonattainment for the California and federal ozone standards, and the California PM_{10} standard.

Table 6: San Joaquin Valley Air Basin Attainment Status

Pollutant	California Status	Federal Status
Ozone	Nonattainment	Nonattainment
PM_{10}	Nonattainment	Attainment/Maintenance
$PM_{2.5}$	Nonattainment	Nonattainment
Carbon Monoxide	Attainment/Unclassified	Attainment/Attainment/Maintenance
Nitrogen Dioxide	Attainment/Unclassified	Attainment/Unclassified
Sulfur Dioxide	Attainment/Unclassified	Attainment/Unclassified
Source: SJVAPCD 2013		

Air Quality Attainment Plans
Ozone Plans
As an extreme nonattainment area for the 1-hour ozone national standard, the SJVAPCD adopted the Extreme Ozone Attainment Demonstration Plan in 2004. On March 8, 2010, the EPA approved the Extreme Ozone Attainment Demonstration Plan for 1-hour ozone. Although effective June 15, 2005, the EPA revoked the 1-hour standard, the control requirements remain in effect to ensure progress toward meeting the new, more stringent 8-hour ozone standard that has replaced the 1-hour standard. The Plan contains commitments to reduce a precursor of ozone, NO_x, including NO_x reductions from indirect sources.

The 2007 Ozone Plan contains measures to reduce ozone and particulate matter precursor emissions to bring the Basin into attainment with the federal 8-hour ozone standard. The 2007 Ozone Plan calls for a 75-percent reduction of NO_x and a 25-percent reduction of ROG. The plan, with a “dual path” strategy, demonstrates attainment of the federal 8-hour ozone standard. The SJVAPCD Governing Board adopted the 2007 Ozone Plan on April 30, 2007. The ARB approved the plan on June 14, 2007.

Particulate Matter Plans
The SJVAPCD adopted the 2007 PM_{10} Maintenance Plan in September 2007 to assure the San Joaquin Valley’s continued attainment of the EPA’s PM_{10} standard. The EPA designated the valley as an attainment/maintenance area for PM_{10}.

The 2008 $PM_{2.5}$ Plan builds upon the strategy adopted in the 2007 Ozone Plan to bring the Basin into attainment of the 1997 national standards for $PM_{2.5}$. The EPA has identified NO_x and sulfur dioxide as precursors that must be addressed in air quality plans for the 1997 $PM_{2.5}$ standards. The 2008 $PM_{2.5}$ Plan is a continuation of the SJVAPCD's strategy to improve the air quality in the Basin. The SJVAPCD adopted the 2012 $PM_{2.5}$ Plan in December 2012. This plan addresses EPA's most recent 24-hour $PM_{2.5}$ standard of 35 µg/m³.

Rules and Regulations

The SJVAPCD administers rules and regulations to obtain and maintain attainment of the State and federal air quality standards. The rules and regulations that apply to this Project include, but are not limited to, the following:

- Rule 4002 - National Emission Standards for Hazardous Air Pollutants.
- Rule 4102 - Nuisance. The purpose of this rule is to protect the health and safety of the public, and applies to any source operation that emits or may emit air contaminants or other materials.
- Rule 4641 - Cutback, Slow Cure, and Emulsified Asphalt, Paving and Maintenance Operations. The purpose of this rule is to limit ROG emissions from asphalt paving and maintenance operations. If asphalt paving will be used, then the paving operations will be subject to Rule 4641.
- Regulation VIII - Fugitive PM_{10} Prohibitions. Rules 8011-8081 are designed to reduce PM_{10} emissions (predominantly dust/dirt) generated by human activity, including construction and demolition activities, road construction, bulk materials storage, paved and unpaved roads, carryout and trackout, etc.
- Rule 9120 Transportation Conformity. This rule incorporates the requirements of the federal Transportation Conformity Rule into the SJVAPCD's rulebook.

Rule 9510 (ISR)

Rule 9510 - Indirect Source Review (ISR) reduces the impact of oxides of nitrogen (NO_x) and PM_{10} emissions from growth in the Air Basin. A master Air Impact Assessment application must be submitted to begin rule compliance.

Compliance with Rule 9510 reduces the emissions impact of the project land uses through incorporation of onsite measures as well as payment of an offsite fee that funds emission reduction projects in the Air Basin. The emissions analysis for Rule 9510 is highly detailed and is dependent on the exact use design that is expected to be constructed or installed. The required amounts of emission reductions required by Rule 9510 for transportation projects that exceed 2 tons per year of NO_X or PM_{10} emissions during construction are as follows:

Construction Exhaust: 20 percent of the total NO_x emissions, and
45 percent of the total PM_{10} emissions.

Fresno Council of Governments

Fresno Council of Governments (Fresno COG) is the Metropolitan Planning Organization (MPO) for Fresno County, and is a voluntary association of local governments consisting of:

- City of Clovis
- City of Coalinga
- City of Firebaugh
- City of Fowler
- City of Fresno
- City of Huron
- City of Kerman
- City of Kingsburg
- City of Mendota
- City of Orange Cove
- City of Parlier
- City of Reedley
- City of San Joaquin
- City of Sanger
- City of Selma
- County of Fresno

As the designated MPO, Fresno COG is mandated by the federal government to research and draw up plans for transportation, growth management, hazardous waste management, and air quality. Additional mandates exist at the state level.

Regional Transportation Plan (RTP)

Transportation control measures provided by Fresno COG include those contained in the Regional Transportation Plans (RTP), the most current version of which is the 2011 RTP. The 2011 RTP has control measures to reduce emissions from on-road sources by incorporating strategies such as high occupancy vehicle interventions, transit, and information-based technology interventions. The measures implemented by ARB and Fresno COG affect the Project indirectly by regulating the vehicles that the residents may use and regulating public transportation.

The project is included in the 2011 RTP through 2011 RTP Amendment #2 as Project ID FRE500768. Excerpts from the 2011 RTP Amendment #2 with the project information is provided in Appendix A.

Fresno COG is currently circulating the 2014 RTP for informal and early public review and comment. The 2014 RTP, also called the Regional Transportation Plan 2040, charts a 25-year course to the year 2040. The 2014 RTP addresses greenhouse gas emission reductions and other air emissions with a goal of sustainable planning.

Federal Transportation Improvement Plan

The FTIP is a compilation of project lists from the State Transportation Improvement Program (STIP), urbanized and non-urbanized areas, and other programs using federal funding. The 2013 FTIP is composed of two parts. The first is a priority list of projects and project segments to be carried out in a four-year period. The second is a financial plan that demonstrates how the TIP can be implemented. The project was included in the 2013 FTIP Appendix F, Regional Transportation Plan Project Listing 2011 through 2035, as RTP ID FRE500768. The project was also included in 2013 FTIP Amendment #1, dated August 2012, as Project ID FRE130069. Excerpts from the 2013 FTIP and 2013 FTIP Amendment #1 with the project information is provided in Appendix A.

Federal Statewide Transportation Improvement Plan
The Federal Statewide Transportation Improvements Plan (FSTIP) covers a four-year period from 2012/2013 through 2015/2016, which includes the listings of proposed transportation projects in the rural non MPO areas of the sate, and incorporates by reference projects listed in the MPO's 2013 FTIPs. Fresno COG submitted their board-approved 2013 FTIP to Caltrans, including 2013 FTIP Amendment #1 made August 2012. The FSTIP was transmitted from Caltrans to FHWA on November 5, 2012.

Transportation Conformity
The FHWA and FTA completed review of the conformity determination for the 2011 RTP and found that the document conforms to the applicable state implementation plan in accordance with the provisions of 40 CFR Parts 51 and 93. The FHWA and FTA issued the determination on December 14, 2010. The FHWA and FTA issued a determination of conformity for the 2011 RTP Amendment #2 on December 14, 2012. The transportation conformity determinations are provided in Appendix A.

The FHWA and FTA completed review of California's 2013 FSTIP, and approved the document as proposed. The FHWA and FTA determined the 2013 FSTIP conforms to the SIP on December 14, 2012. The 2013 FSTIP incorporated by reference those projects included in the 2012/2013 Federal Transportation Improvement Programs (FTIP) adopted by the MPOs in California. This conformity determination includes Fresno COG 2013 FTIP Amendment #1, which lists the project

Pollutants of Concern
As described above, the Project area is designated nonattainment for the federal and State ozone and $PM_{2.5}$ standards. Because the area exceeds these health-based ambient air quality standards, ozone is the main criteria pollutants of concern for the Project area. The Project area is in attainment/maintenance of the federal PM_{10} standards, but is nonattainment for the state's PM_{10} standard. In addition, asbestos and MSAT are generally a concern for construction projects. Other pollutants of concern are TACs and greenhouse gases.

The Project, as a 0.74-mile road reconstruction project, is not considered a source of potentially significant quantities of nitrogen dioxide, sulfur dioxide, lead, hydrogen sulfide, sulfates, or vinyl chloride; therefore, those pollutants are not included as "pollutants of concern" for the Project and are not included in the impact analysis.

The emissions sources and potential health effects of the pollutants of concern are described below. The discussions of properties and health effects below are based on sources including the Environmental Protection Agency and the California Air Resources Board.

Ozone
Ozone is not emitted directly into the air, but is a regional pollutant formed by a photochemical reaction in the atmosphere. Ozone precursors, which include reactive organic gases (ROG) and NO_X, react in the atmosphere in the presence of sunlight to form ozone. Because photochemical reaction rates depend on the intensity of ultraviolet light and air temperature, ozone is primarily a summer air pollution problem. Often, the effects of emitted ROG and NO_X are felt a distance downwind of the emission sources. Ozone is subsequently considered a regional pollutant. Ground-level ozone is

a respiratory irritant and an oxidant that increases susceptibility to respiratory infections and can cause substantial damage to vegetation and other materials.

Ozone can irritate lung airways and cause inflammation much like sunburn. Other symptoms include wheezing, coughing, pain when taking a deep breath, and breathing difficulties during exercise or outdoor activities. People with respiratory problems are most vulnerable, but even healthy people who are active outdoors can be affected when ozone levels are high. Chronic ozone exposure can induce morphological (tissue) changes throughout the respiratory tract, particularly at the junction of the conducting airways and the gas exchange zone in the deep lung. Anyone who spends time outdoors in the summer is at risk, particularly children and other people who are more active outdoors. Even at very low levels, ground-level ozone triggers a variety of health problems, including aggravated asthma, reduced lung capacity, and increased susceptibility to such respiratory illnesses as pneumonia and bronchitis.

Ozone also damages vegetation and ecosystems. It leads to reduced agricultural crop and commercial forest yields; reduced growth and survivability of tree seedlings; and increased susceptibility to diseases, pests, and other stresses such as harsh weather. In addition, ozone causes damage to buildings, rubber, and some plastics.

Nitrogen Oxides
During combustion of fossil fuels, oxygen reacts with nitrogen to produce nitrogen oxides or NO_X. This occurs primarily in motor vehicle internal combustion engines and fossil fuel-fired electric utility facilities and industrial boilers. The pollutant NO_X is a concern because it is an ozone precursor, which means that it helps form ozone. When NO_X and ROG are released in the atmosphere, they can chemically react with one another in the presence of sunlight and heat to form ozone. NO_X can also be a precursor to PM_{10} and $PM_{2.5}$.

Because NO_X and ROG are ozone precursors, the health effects associated with ozone (as discussed above) are also indirect health effects associated with significant levels of NO_X and ROG emissions.

Reactive Organic Gases and Volatile Organic Compounds
ROG, also known as volatile organic compounds (VOC) are defined as any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, which participate in atmospheric photochemical reactions. ROG consist of nonmethane hydrocarbons and oxygenated hydrocarbons. Hydrocarbons are organic compounds that contain only hydrogen and carbon atoms. Nonmethane hydrocarbons are hydrocarbons that do not contain the unreactive hydrocarbon methane. Oxygenated hydrocarbons are hydrocarbons with oxygenated functional groups attached.

There are no state or national ambient air quality standards for ROG because they are not classified as criteria pollutants. They are regulated, however, because a reduction in ROG emissions reduces certain chemical reactions that contribute to the formulation of ozone. ROG also are transformed into organic aerosols in the atmosphere, which contribute to higher PM_{10} levels and lower visibility.

Particulate Matter (PM_{10} and $PM_{2.5}$)
PM is the term for a mixture of solid particles and liquid droplets found in the air. Some particles, such as dust, dirt, soot, or smoke, are large or dark enough to be seen with the naked eye. Others are so small they can only be detected using an electron microscope.

Particle pollution includes "inhalable coarse particles," with diameters larger than 2.5 micrometers and smaller than 10 micrometers and "fine particles," with diameters that are 2.5 micrometers and smaller. For reference, $PM_{2.5}$ is approximately one-thirtieth the size of the average human hair.

These particles come in many sizes and shapes and can be made up of hundreds of different chemicals. Some particles, known as primary particles, are emitted directly from a source, such as construction sites, unpaved roads, fields, smokestacks, or fires. Others form in complicated reactions in the atmosphere from chemicals such as sulfur dioxides and nitrogen oxides that are emitted from power plants, industrial activity, and automobiles. These particles, known as secondary particles, make up most of the fine particle pollution in the United States.

Particle exposure can lead to a variety of health effects. For example, numerous studies link particle levels to increased hospital admissions and emergency room visits—and even to death from heart or lung diseases. Both long- and short-term particle exposures have been linked to health problems. Long-term exposures, such as those experienced by people living for many years in areas with high particle levels, have been associated with problems such as reduced lung function, the development of chronic bronchitis, and even premature death. Short-term exposures to particles (hours or days) can aggravate lung disease, causing asthma attacks and acute bronchitis, and may increase susceptibility to respiratory infections. In people with heart disease, short-term exposures have been linked to heart attacks and arrhythmias. Healthy children and adults have not been reported to suffer serious effects from short-term exposures, although they may experience temporary minor irritation when particle levels are elevated.

Carbon Monoxide
CO is a colorless, odorless gas that is formed when carbon in fuel is not burned completely. It is a component of motor vehicle exhaust, which contributes about 56 percent of all CO emissions nationwide. Higher levels of CO generally occur in areas with heavy traffic congestion.

CO is a public health concern because it combines readily with hemoglobin, reducing the amount of oxygen transported in the bloodstream. High levels of CO can affect even healthy people. At extremely high levels, CO is poisonous and can cause death.

Motor vehicles are the dominant source of CO emissions in most areas. CO is described as having only a local influence because it dissipates quickly. High CO levels develop primarily during winter, when periods of light winds combine with the formation of ground-level temperature inversions (typically from the evening through early morning). These conditions result in reduced dispersion of vehicle emissions. Because CO is a product of incomplete combustion, motor vehicles exhibit increased CO emission rates at low air temperatures. High CO concentrations occur in areas of limited geographic size, sometimes referred to as hot spots.

Toxic Air Contaminants
In addition to the above-listed criteria pollutants, toxic air contaminants (TACs), also known as hazardous air pollutants, are another group of pollutants of concern. A TAC is defined as an air pollutant that may cause or contribute to an increase in mortality or serious illness, or that may pose a hazard to human health. TACs are usually present in minute quantities in the ambient air; however, their high toxicity or health risk may pose a threat to public health even at low concentrations. In general, for those TACs that may cause cancer, there is no concentration that does not present some risk. In other words, there is no threshold level below which adverse health impacts are not expected to occur. This contrasts with the criteria pollutants for which acceptable levels of exposure can be determined and for which the state and federal governments have set ambient air quality standards.

According to the California Almanac of Emissions and Air Quality, the majority of the estimated health risk from TACs can be attributed to relatively few compounds, the most important being diesel particulate matter (DPM) from diesel-fueled engines (ARB 2009). Asbestos is a concern for construction projects. However, City of Fresno does not contain known potential for naturally occurring asbestos (NOA). Therefore, NOA is not a concern for the Project, and is not discussed in this section.

Mobile Source Air Toxics
MSAT are a subset of the 188 air toxics defined by the CAA. The MSATs are compounds emitted from highway vehicles and non-road equipment. Of the 21 identified MSAT compounds, the EPA has listed seven as "priority" MSATs: benzene, formaldehyde, DPM/diesel exhaust organic gases, acrolein, 1,3-butadiene, naphthalene, and polycyclic organic matter.

Diesel Particulate Matter
The ARB identified the PM emissions from diesel-fueled engines as a TAC in August 1998 under California's TAC program. The State of California, after a 10-year research program, determined in 1998 that DPM from diesel-fueled engines is a human carcinogen and that chronic (long-term) inhalation exposure to DPM poses a chronic (long-term) health risk. The California Office of Environmental Health Hazard Assessment recommends using a 70-year exposure duration for determining residential cancer risks. DPM is emitted from both mobile and stationary sources. In California, on-road diesel-fueled vehicles contribute approximately 40 percent of the statewide total, with an additional 57 percent attributed to other mobile sources such as construction and mining equipment, agricultural equipment, and transport refrigeration units.

Project Impacts

Alternative 1
Less than significant impact. The SJVAPCD specifies that a project is conforming to the applicable attainment or maintenance plan if it:

1. Complies with all applicable SJVAPCD rules and regulations,
2. Complies with all applicable control measures from the applicable plans, and
3. Is consistent with the growth forecast in the applicable plans.

Following is a discussion of each of the three criteria.

Under the first criterion, a project needs to comply with all applicable SJAPCD rules and regulations. Compliance with adopted SJVAPCD rules and regulations is a requirement under the law, and therefore, the implementation of Alternative 1 will comply with all adopted SJVAPCD rules and regulations. The applicable rules and regulations are described above. Alternative 1 would comply with the first criterion.

The second criterion states that a project must comply with all applicable control measures from the applicable SJVAPCD attainment plans. These attainment plans include the 2004 Extreme Ozone Attainment Demonstration Plan, 2007 Ozone Plan, 2007 PM_{10} Maintenance Plan, and 2008 $PM_{2.5}$ Plan, and 2012 $PM_{2.5}$ Plan. A discussion of each plan is provided below.

The 2004 Extreme Ozone Attainment Demonstration Plan includes control measures to reduce a precursor of ozone, NOx, including NOx reductions from indirect sources.

The 2007 Ozone Plan contains measures to reduce ozone and particulate matter precursor emissions to bring the Air Basin into attainment wit the federal 8-hour ozone standard.

The 2007 PM_{10} Maintenance Plan ensures the San Joaquin Valley's will continue to attain the EPA's PM_{10} standard.

The 2008 $PM_{2.5}$ Plan builds upon the strategy adopted in the 2007 Ozone Plan to bring the Air Basin into attainment of the 1997 national standards for $PM_{2.5}$. This Plan is a continuation of the SJVAPCD's strategy to improve the air quality in the Air Basin.

The 2012 $PM_{2.5}$ Plan addresses EPA's most recent 24-hour standard of 35 ug/m^3.

The applicable control measures have been adopted as SJVAPCD rules and regulations. Therefore, implementation of Alternative 1 will comply with all adopted SJVAPCD rules and regulations and thus will the applicable control measures. Alternative 1 would comply with the second criterion.

Finally, the Project is consistent with the growth forecast in the San Joaquin Valley Air Quality Attainment Plan. The proposal for Fulton Mall to reintroduce two-way, two-lane street within Fulton Mall and designate the streets as collector streets has been included in the approved 2011 RTP Amendment #2 as Project ID FRE500768. The 2011 RTP has control measures to reduce emissions from on-road sources by incorporating strategies such as high occupancy vehicle interventions, transit, and information-based technology interventions. These measures that have been implemented by the California Air Resources Board and Fresno COG affect Alternative 1 indirectly by regulating the vehicles that the residents and patrons may use and regulating public transportation. The control measures would not directly apply to the construction and operation of Alternative 1. Since the Reconstruction of Fulton Mall, including Alternative 1, is included in the approved RTP, Alternative 1 is consistent with the growth forecast for the region. Furthermore, the implementation of Alternative 1 would not propose any additional traffic generating land uses. Alternative 1 would result in the re-distribution of existing traffic volumes in the vicinity of Fulton Mall, but the project will not directly increase traffic volumes. Alternative 1 would comply with the third criterion.

Alternative 2

Less than significant impact. The determination of less than significant impact on conflicting with the applicable air quality plan as described above for Alternative 1 would be the same for Alternative 2.

Cumulative Impacts

Less than significant impact. As identified above, the SJVAPCD prepared attainment and maintenance plans to bring the Air Basin into attainment with the ambient air quality standards. As cumulative development occurs throughout Downtown Fresno, each development will be required to comply with the SJVAPCD rules and regulations. Furthermore, each development will be required to be consistent with the growth forecasted and accounted for in the SJVAPCD attainment and maintenance plans. As stated above, the implementation of Alternatives 1 or 2 will conform to the applicable attainment and maintenance plans. Cumulatively, Alternatives 1 or 2 in conjunction with cumulative development within Downtown Fresno is expected to result in less than significant cumulative impacts on the applicable air quality plan. Furthermore, development of Alternative 1 or 2 would contribute less than cumulatively significant impacts on the applicable air quality plan.

Air Quality Standards/Violations

b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?

Project Impacts

Alternative 1

Less than significant impact. Since criteria pollutants are pollutants with ambient air quality standards, analysis within this section is related to construction and operational criteria pollutant impacts.

Construction Pollutants

Thresholds

The San Joaquin Valley Air Pollution Control (SJVAPCD) provides recommended significance thresholds in their Guide for Assessing and Mitigating Air Quality Impacts (GAMAQI). The SJVAPCD's thresholds are provided in Table 7. The SJVAPCD's thresholds are utilized for the majority of CEQA impact analysis, as requested by the CEQA Lead Agency.

Table 7: Significant Emissions Thresholds

Pollutant	Annual Threshold (tons)
Oxides of nitrogen (NO_x)	10
Reactive organic gases (ROG)	10
Particulate matter (PM_{10})	15
Particulate matter ($PM_{2.5}$)	15
Source: SJVAPCD 2002	

Construction Emissions

Construction emissions can vary substantially from day to day, depending on the level of activity, the specific type of activity, and the prevailing weather conditions. The methodology developed for the purposes of this quantitative air quality analysis was based on information available at the time of analysis; actual equipment and activity intensity at the time of construction may vary from those analyzed in this document. However, it is anticipated that the level of activity analyzed is representative of activities that will occur during construction. The main sources of air pollutants associated with the Project include off-road construction equipment exhaust, worker trips, and fugitive PM_{10} and $PM_{2.5}$ emissions. The annual emissions for project demolition activity were estimated using CalEEMod. The annual emissions for project construction were estimated using the Roadway Construction Emissions Model, version 7, developed by Sacramento Metropolitan Air Quality Management District. The assumed construction phase durations are shown in Table 8 and Table 9.

Table 8: Construction Duration - Fulton Mall

Phase	Duration		
	Weeks	Working Days	Months
Demolition	3 weeks	15 days	0.75 months
Soil Excavation and Export	6 weeks	30 days	1.5 months
Storm Drain Replacement	12 weeks	60 days	3 months
Curb and Gutter	6 weeks	30 days	1.5 months
Asphalt and Rock	6 weeks	30 days	1.5 months
Sidewalk	12 weeks	60 days	3 months

Table 9: Construction Duration - Cross Malls

Phase	Duration		
	Weeks	Working Days	Months
Demolition	2 weeks	10 days	0.5 months
Soil Excavation and Export	3.75 weeks	19 days	0.94 months
Storm Drain Replacement	6 weeks	30 days	1.5 months
Curb and Gutter	3 weeks	15 days	0.75 months
Asphalt and Rock	3 weeks	15 days	0.75 months
Sidewalk	5 weeks	25 days	1.25 months

Based on the following roadway widths and lengths to be improved and the Project layout, the emissions analysis assumed the following construction activity:

Fulton Street

- Approximately 2,747 feet of length (0.52 mile) would be paved,
- Approximately 5.0 acres would be disturbed during the course of the Fulton Street construction,
- A maximum of 0.1 acre would be disturbed on any one day,
- Project construction would begin in 2014,
- Demolition would result in 6,867 tons of material removed; 18 tons per truck, 382 one-way trips for materials hauling; average 8-miles per one-way trip for a total of 6,112 truck trip miles
- Soils Excavation
  - Option 1 soils excavation would result in 4,477 cubic yards (cyd) of materials; 16 cyd per truck at 8 miles per one-way trip for a total of 4,480 soils hauling truck miles.
  - Option 2 soils excavation would result in 4,070 cyd of materials; 16 cyd per truck at 8 miles per one-way trip for a total of 4,070 soils hauling truck miles.
- Storm Drain replacement would result in 2,440 cyd of onsite materials movement with no export or import,
- Curb and Gutter would result in 286 cyd of soils removal, at 8 cyd per truck and 8 miles per one-way trip for a total of 288 on-road hauling miles,
- Asphalt and Rock
- Rock
  - Option 1 asphalt and rock would result in emplacement of 3,000 cyd (5,264 tons) of rock; 20 tons per truck at 8 miles per one-way trip for 4,208 miles of rock hauling trips.
  - Option 2 asphalt and rock would result in emplacement of 2,727 cyd (4,785 tons) of rock; 20 tons per truck at 8 miles per one-way trip for 3,840 miles of rock hauling trips.
- Asphalt
  - Option 1 asphalt and rock would result in emplacement of 1,522 cyd (2,979 tons) of asphalt; 22 tons per truck at 8 miles per one-way trip for 2,160 miles of asphalt hauling trips.
  - Option 2 asphalt and rock would result in emplacement of 1,384 cyd (2,708 tons) of asphalt; 22 tons per truck at 8 miles per one-way trip for 1,968 miles of asphalt hauling trips.
- Sidewalks
  - Option 1 sidewalks would result in 1,394 cyd of concrete emplacement; 8 cyd per truck at 8 miles per one-way trip for a total of 2,784 concrete hauling truck miles.
  - Option 2 sidewalks would result in 1,549 cyd of concrete emplacement; 8 cyd per truck at 8 miles per one-way trip for a total of 3,104 concrete hauling truck miles.
  - Cross Malls
- Approximately 1,410 feet of length (0.27 mile) would be paved,

- Approximately 2.6 acres would be disturbed during the course of the Cross Malls street construction,
- A maximum of 0.1 acre would be disturbed on any one day,
- Project construction would begin in 2014,
- Demolition
  - Mariposa Mall demolition would result in 25,335 cubic yards (1,900 tons) of materials removed; 18 tons per truck at 8 miles per one-way trip for a total of 1,696 materials hauling truck miles.
  - Kern and Merced Malls demolition would result in 47,004cubic yards (3,525 tons) of materials removed; 18 tons per truck at 8 miles per one-way trip for a total of 3,136 materials hauling truck miles.
- Soils Excavation
  - Mariposa Mall soils excavation would result in 1,239 cubic yards (cyd) of materials; 16 cyd per truck at 8 miles per one-way trip for a total of 1,232 soils hauling truck miles.
  - Kern and Merced Streets soils excavation would result in 991 cubic yards (cyd) of materials; 16 cyd per truck at 8 miles per one-way trip for a total of 992 soils hauling truck miles.
- Storm Drain replacement would result in 1,253 cyd of onsite materials movement with no export or import,
- Curb and Gutter would result in 141 cyd of soils removal, at 8 cyd per truck and 8 miles per one-way trip for a total of 144 on-road hauling miles,
- Asphalt and Rock
- Rock
  - Mariposa Mall asphalt and rock would result in emplacement of 830 cyd (1,456 tons) of rock; 20 tons per truck at 8 miles per one-way trip for 1,168 miles of rock hauling trips.
  - Kern and Merced Streets asphalt and rock would result in emplacement of 664 cyd (1,166) of rock; 20 tons per truck at 8 miles per one-way trip for 944 miles of rock hauling trips.
- Asphalt
  - Mariposa Mall asphalt and rock would result in emplacement of 421 cyd (824 tons) of asphalt; 22 tons per truck at 8 miles per one-way trip for 592 miles of asphalt hauling trips.
  - Kern and Merced Streets asphalt and rock would result in emplacement of 337 cyd (660 tons) of asphalt; 22 tons per truck at 8 miles per one-way trip for 480 miles of asphalt hauling trips.
- Sidewalks would result in 918 cyd of concrete emplacement; 8 cyd per truck at 8 miles per one-way trip for a total of 1,840 concrete hauling truck miles.

Demolition activity was estimated using CalEEMod. For the purposes of modeling the on-road hauling emission for soils export, rock import, asphalt import, and concrete export, for the non-demolition phases in the Roadway Construction Emissions Model, a summary of hauling miles was

prepared. Summaries of hauling miles for Fulton Mall Alternative 1 and the Cross Malls construction are provided in Table 10 and Table 11, respectively. The CalEEMod and Roadway Construction Emissions Model output is provided in Appendix B.

Table 10: Hauling Miles- Fulton Mall Alternative

Phase	Hauling Parameter		
	Round Trip Length (Miles)	Total Round Trips	Total Miles
Soil Excavation and Export	16	280	4,480
Curb and Gutter	16	18	288
Rock	16	263	4,208
Asphalt	16	135	2,160
Sidewalk	16	174	2,784
Total	—	870	13,920

Table 11: Hauling Miles - Cross Malls

Phase	Hauling Parameter		
	Round Trip Length (Miles)	Total Round Trips	Total Miles
Soil Excavation and Export - Mariposa	16	77	1,232
Soil Excavation and Export - Kern and Merced	16	62	992
Curb and Gutter	16	9	144
Rock - Mariposa	16	73	1,168
Rock - Kern and Merced	16	59	944
Asphalt - Mariposa	16	37	592
Asphalt - Kern and Merced	16	30	480
Sidewalks	16	155	1,840
Total	—	462	7,392

Results

The Project's construction emissions (equipment exhaust and dust generation) during construction are compared with the SJVAPCD's significance thresholds and are summarized in Table 12. As shown in Table 12, unmitigated emissions during construction do not exceed the daily or annual significance thresholds.

Table 12: Annual Construction Emissions (Alternative 1)

Activity	Emissions (tons per day)			
	ROG	NO_X	PM_{10}	$PM_{2.5}$
Fulton Mall Demolition	0.07	0.57	0.15	0.04
Fulton Mall Soils Excavation, Storm Drain Replacement Curb and Gutter, Rock and Asphalt, Sidewalks	0.60	5.30	0.40	0.30
Subtotal Fulton Mall	0.67	5.87	0.55	0.34
Cross Malls Demolition	0.05	0.39	0.10	0.03
Cross Malls Soils Excavation, Storm Drain Replacement Curb and Gutter, Rock and Asphalt, Sidewalks	0.30	2.70	0.20	0.10
Subtotal Cross Mall	0.35	3.09	0.30	0.13
Total Project Construction	1.02	8.96	0.85	0.47
SJVAPCD Threshold	10	10	10	15
Exceed Threshold?	No	No	No	No
Source: MBA 2013, Appendix DE				

Operational Pollutants

Operational Carbon Monoxide Hotspots

Alternative 1 may be considered significant if a CO hot spot intersection analysis determines that CO concentrations generated either directly or indirectly by the project cause a localized violation of the State CO 1-hour standard of 20 ppm, State CO 8-hour standard of 9 ppm, federal CO 1-hour standard of 35 ppm, or federal CO 8-hour standard of 9 ppm.

Localized high levels of carbon monoxide (CO hot spot) are associated with traffic congestion and idling or slow moving vehicles. To provide a worst-case scenario, CO concentrations are estimated at project-impacted intersections, where the concentrations would be the greatest.

Using the CALINE4 model, potential CO hot spots were analyzed at the intersections provided in Table 13. The intersections were chosen because they projected to operate at LOS E or worse prior to any potential mitigation. There are several inputs to the CALINE4 model. One input is the traffic volumes, which is from the project-specific traffic report. The traffic volumes with the project, which includes Alternative 1, were used for the buildout scenario as well as emission factors generated using the EMFAC2007 model for the year 2015 and 2035.

As shown in Table 13, the estimated 1-hour and 8-hour average CO concentrations at intersections that would operate at LOS E or F under Baseline Plus Project and Cumulative Plus Project Conditions in combination with background concentrations are below the state and federal standards. Therefore, there are no CO hot spots anticipated from the reassigned project and cumulative traffic emissions.

Table 13: Localized Carbon Monoxide Concentrations

Intersection	Peak Hour	Estimated CO Concentration (ppm)		Significant Impact?
		1 Hour	8 Hour	
9) Fresno Street/Van Ness Avenue, Baseline Plus Project Conditions	PM	3.0	2.1	No
16) Ventura Avenue /H Street, Cumulative Plus Project Conditions	PM	2.8	1.9	No

Notes:
The 1-hour concentration is the CALINE4 output (see Appendix C D for model output) plus the 1-hour background concentration of 2.47 ppm (Calculated by dividing the 8-hour measurement from Table 3 by the persistence factor of 0.7).
The 8 hour project increment was calculated by multiplying the 1 hour CALINE4 output by 0.7 (persistence factor), then adding the 8 hour background concentration of 1.73 ppm (from Table 3).
A significant impact would occur if the estimated CO concentration is over the 1-hour state standard of 20 ppm or the 8-hour state/federal standard of 9 ppm.

Operational conditions under Alternative 1 would result in less than significant concentrations of carbon monoxide.

Mitigation Measures

Construction and operational emissions associated with the implementation of Alternative 1 would result in less than significant impacts to air quality in relation to criteria pollutants. The following mitigation measures are recommended to ensure air emissions are minimized.

Construction Fugitive Dust

MM AIR-1 During construction, in addition to San Joaquin Valley Air Pollution Control District Regulation VIII requirements for dust control, the project shall also implement the following additional dust control measures:

- Limit traffic speeds on unpaved roads to 15 mph;
- Install sandbags or other erosion control measures to prevent silt runoff to public roadways from sites with a slope greater than one percent.
- Install wheel washers for all exciting trucks, or wash off all trucks and equipment leaving the site;
- Install wind breaks at windward sides(s) of construction areas; and
- Suspend excavation and grading activity when winds exceed 20 mph. Regardless of wind speed, an owner/operator must comply with Regulation VIII's 20 percent opacity limitation.

- Post a publicly visible sign with the telephone number and person to contact at the lead agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The San Joaquin Valley Air Pollution Control District's phone number shall also be visible to ensure compliance with applicable regulations.

Construction Equipment Exhaust

MM AIR-2 During construction, the project shall also implement the following additional construction equipment exhaust control measures:

- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.
- All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified visible emissions evaluator.
  - The project shall develop a plan demonstrating that the off-road equipment (more than 50 horsepower) to be used in the construction project (i.e., owned, leased, and subcontractor vehicles) would achieve a project wide fleet-average 20 percent NO_X reduction and 45 percent PM_{10} reduction compared to the most recent ARB fleet average. Acceptable options for reducing emissions include the use of late model engines, low-emission diesel products, alternative fuels, engine retrofit technology, after-treatment products, add-on devices such as particulate filters, and/or other options as such become available.

Alternative 2

Less than significant impact. The determination of less than significant impact to air quality in relation to criteria pollutants as described above for Alternative 1 would be the same for Alternative 2. Following is an analysis of the construction emissions associated with Alternative 2. Operational emissions for Alternative 2 would be the same as Alternative 1.

Demolition activity for Alternative 2 was estimated using CalEEMod. For the purposes of modeling the on-road hauling emission for soils export, rock import, asphalt import, and concrete export, for the non-demolition phases in the Roadway Construction Emissions Model, a summary of hauling miles was prepared. A summary of hauling miles for Fulton Mall Alternative 2 is provided in Table 14. Hauling parameters for the Cross Malls under Alternative 2 would be the same as identified for Alternative 1, above. The CalEEMod and Roadway Construction Emissions Model output is provided in Appendix B.

Table 14: Hauling Miles- Fulton Mall Alternative 2

Phase	Hauling Parameter		
	Round Trip Length (Miles)	Total Round Trips	Total Miles
Soil Excavation and Export	16	254	4,070
Curb and Gutter	16	18	288
Rock	16	240	3,840
Asphalt	16	123	1,968
Sidewalk	16	196	3,140
Total	—	832	13,306

Results
The Project's construction emissions (equipment exhaust and dust generation) during construction are compared with the SJVAPCD's significance thresholds and are summarized in Table 15. As shown in Table 15, unmitigated emissions during construction do not exceed the daily or annual significance thresholds.

Table 15: Annual Construction Emissions (Alternative 2)

Activity	Emissions (tons per day)			
	ROG	NO_X	PM_{10}	$PM_{2.5}$
Fulton Mall Demolition	0.07	0.57	0.15	0.04
Fulton Mall Soils Excavation, Storm Drain Replacement Curb and Gutter, Rock and Asphalt, Sidewalks	0.60	5.30	0.40	0.30
Subtotal Fulton Mall	0.67	5.87	0.55	0.34
Cross Malls Demolition	0.05	0.39	0.10	0.03
Cross Malls Soils Excavation, Storm Drain Replacement Curb and Gutter, Rock and Asphalt, Sidewalks	0.30	2.70	0.20	0.10
Subtotal Cross Mall	0.35	3.09	0.30	0.13
Total Project Construction	1.02	8.96	0.85	0.47
SJVAPCD Threshold	10	10	10	15
Exceed Threshold?	No	No	No	No
Source: MBA 2013, Appendix DE				

Alternative 2 would not exceed the SJVAPCD's annual thresholds for ROG, NO_X, PM_{10} or $PM_{2.5}$ during the construction duration of 14 months. Therefore, the project would result in less than significant impacts to an air quality standard.

Mitigation Measures

Construction and operational emissions associated with the implementation of Alternative 2 would result in less than significant impacts to air quality in relation to criteria pollutants. The following mitigation measures are recommended to ensure air emissions are minimized.

- Implementation of mitigation measure AIR-1 is recommended.
- Implementation of mitigation measure AIR-2 is recommended.

Cumulative Impacts

Less than significant impact. Construction emissions associated with Alternative 1 or 2 could cumulatively combine with other emissions in the Air Basin. However, the SJVAPCD has determined that a project-level exceedance of any of the criteria pollutant thresholds would have a significant cumulative impact on the air quality in the Air Basin by jeopardizing the Air Basin's attainment of state and federal standards. If a project does not result in a project-level exceedance of any criteria pollutant threshold, the project would not result in a cumulatively considerable contribution to cumulative emissions within the Basin, and therefore, would have a less than significant cumulative impact. Since Alternatives 1 or 2 would not generate construction emissions that would exceed criteria pollutant thresholds, Alternative 1 or 2 would result in a contribution of air emissions that are considered less than cumulatively considerable.

In addition, as described under Alternative 1, operational CO concentrations at the Ventura Street and H Street intersection, which is considered an intersection representing potential worst-case CO concentrations under the Cumulative Plus Project Condition, would not exceed the state or federal CO standard. Therefore, the implementation of Alternative 1 or 2 would result in less than significant cumulative impacts associated with CO concentrations.

Overall, Alternative 1 or 2 would result in a less than significant cumulative air quality impact related to violating air quality standards or contributing substantially to an existing or projected air quality violation.

Criteria Pollutant

c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions, which exceed quantitative thresholds for ozone precursors)?

Project Impacts

Alternative 1

Less than significant impact. The evaluation of potential cumulatively considerable net increase of any criteria pollutant is addressed in CEQA Checklist Question 3.3 b) above. The evaluation in 3.3 b)

above determined that Alternative 1 would result in a less than significant cumulative impact on criteria pollutants. Therefore, the determination for this CEQA Checklist Question 3.3 c) is less than significant cumulative impact on criteria pollutants.

Alternative 2

Less than significant impact. As described above, the determination of less than significant cumulative impacts on criteria pollutants under Alternative 2 is provided above in CEQA Checklist Question 3.3 b).

Cumulative Impacts

Less than significant impact. As described above, the determination of less than significant cumulative impacts on criteria pollutants is provided above in CEQA Checklist Question 3.3 b).

Sensitive Receptors

d) Expose sensitive receptors to substantial pollutant concentrations?

Those who are sensitive to air pollution include children, the elderly, and persons with preexisting respiratory or cardiovascular illness. A sensitive receptor is considered to be a location where a sensitive individual could remain for 24 hours, such as residences, hospitals, or convalescent facilities. Commercial and industrial facilities are not included in the definition because employees do not typically remain onsite for 24 hours. However, when assessing the impact of pollutants with 1-hour and 8-hour standards (such as carbon monoxide), commercial and/or industrial facilities would be considered sensitive receptors for those purposes.

The nearest sensitive receptors are the existing residences that are located in the Hotel Californian, Pacific Southwest Building, and Masten Towers.

There are three toxic air contaminants/hazardous air pollutants that are considered applicable to the Reconstruction of Fulton Mall. These pollutants include Mobile Source Air Toxics (MSAT), Naturally Occurring Asbestos (NOA), and Diesel Particulate Matter (DPM).

Project Impacts

Alternative 1

Less than significant impact. Implementation of Alternative 1 would not expose sensitive receptors to substantial concentrations of MSAT, NOA, or DPM, as discussed below.

Mobile Source Air Toxics

The 2009 Interim Guidance Update on Mobile Source Air Toxic Analysis (2009 Interim MSAT Guidance), published by the Federal Highway Administration (FHWA), was utilized to determine the project's potential for MSAT impacts. The FHWA has developed a tiered approach for analyzing MSAT, which are based on three levels of analysis:

1. No analysis for projects with no potential for meaningful MSAT effects;
2. Qualitative analysis for projects with low potential MSAT effects; or

3. Quantitative analysis to differentiate alternatives for projects with higher potential for MSAT effects.

Under the first level, projects with no potential for meaningful MSAT effects, the types of projects included are:

- Projects qualifying as a categorical exclusion under 23 CFR 771.117(c)
- Projects except under the Clean Air Act conformity rule under 40 CFR 93.126; or
- Other projects with no meaningful impacts on traffic volumes or vehicle mix.

Analysis shows that the implementation of Alternative 1 would have no meaningful impacts on traffic volumes or vehicle mix for the project area, as detailed below. However, Alternative 1 would reassign existing trips in the project area. Alternative 1 does not propose any additional traffic generating land uses. Since Alternative 1 includes two-way vehicular streets, it is anticipated that the reintroduced roadways associated with this alternative would serve existing traffic by providing access to existing businesses within Fulton Mall, but would not induce additional travel upon opening as described in the project traffic report (see Appendix J1). Based on a review of the project traffic report, except for Fulton Street, Alternative 1 would slightly increase average daily traffic on seven of the 15 roadway segments that were evaluated. The maximum increase would be 72 average daily trips (ADT) compared to the baseline conditions and 410 ADT under cumulative plus project conditions compared to cumulative no project conditions. Fulton Street between Inyo Street and Tuolumne Street would experience 210 average daily trips under baseline plus project conditions and 2,310 ADT under cumulative plus project conditions.

The apparent increase is not a trip increase from Alternative 1, but is a result of reassignment of existing trips through the project area. All trips would be existing in the project area under Alternative 1. Existing trips within the project area would be rerouted from existing travel paths through the project segments.

Alternative 1 would not increase the number of trips on the project area roadways compared to baseline conditions. However, Alternative 1 would reassign existing trips to a new location, the Fulton Mall. The relocation of existing trips may have a low potential for MSAT emissions.

A qualitative analysis provides a basis for identifying MSAT emissions. The qualitative assessment presented below is derived in part from a study conducted by the FHWA entitled *A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives*, found at: www.fhwa.dot.go/environment/air_quality/air_toxics/research_and_analysis/methodology/methodology00.cfm.

The 2009 Interim MSAT Guidance provides examples of qualitative MSAT analyses for different types of projects. Each project is different, and some projects may contain elements covered in more than one of the examples below. Analysts can use the example language as a starting point, but should tailor it to reflect the unique circumstances of the project being considered. The types of example projects include minor widening projects; new interchanges, replacing a signalized intersection on a surface street; or projects where design year traffic is projected to be less than 140,000 to 150,000

annual average daily traffic (AADT). As identified above, Alternative 1 is estimated to facilitate 210 existing AADT under a baseline condition (2015), and 2,310 AADT under a cumulative condition (2035).

The amount of MSAT emitted under Alternative 1 would be proportional to the vehicle miles traveled, or VMT. The VMT estimated for Alternative 1 is the same as for the baseline condition and the cumulative no project condition, however, Alternative 1 increases the efficiency of the roadway and attracts rerouted trips from elsewhere in the transportation network. This relocation of VMT would lead to higher MSAT emissions for Alternative 1 along the project alignment, along with a corresponding decrease in MSAT emissions along the parallel routes. The emissions increase is offset somewhat by lower MSAT emission rates due to increased speeds; according to EPA's MOVES2010b model, emissions of all of the priority MSAT decrease as speed increases. Emissions will likely be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce annual MSAT emissions by over 80 percent between 2010 and 2050. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in nearly all cases.

The reintroduced travel lanes contemplated as part of Alternative 1 will have the effect of moving some traffic closer to nearby residences; therefore, there may be localized areas where ambient concentrations of MSAT could be higher compared to the no build conditions. The localized increases in MSAT concentrations would likely be most pronounced along the expanded roadway sections that would be built at Fulton Mall. However, the magnitude and the duration of these potential increases compared to the baseline or cumulative no project conditions cannot be reliably quantified due to incomplete or unavailable information in forecasting project-specific MSAT health impacts. In sum, when a roadway is reintroduced, the localized level of MSAT emissions for Alternative 1 could be higher relative to the no build condition, but this could be offset due to increases in speeds and reductions in congestion in the project area (which are associated with lower MSAT emissions). Also, MSAT will be lower in other locations when traffic shifts away from them. However, on a regional basis, EPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause region-wide MSAT levels to be significantly lower than today.

Furthermore, analysis shows Alternative 1 would generate minimal air quality impacts for the Clean Air Act criteria pollutants, as described in CEQA Checklist Question 3.3 b) and has not been linked with any special MSAT concerns.

Moreover, EPA regulations for the vehicle engines and fuels will cause overall MSAT emissions to decline significantly over the next several decades. Based on regulations now in effect, an analysis of national trends with EPA’s MOBILE6.2 model forecasts a combined reduction of 72 percent in the total annual emission rate for the priority MSAT from 1999 to 2050 while vehicle miles of travel are projected to increase by 145 percent. This will both reduce the background levels of MSAT as well as the possibility of even minor MSAT emissions from this project.

Overall, the implementation of Alternative 1 would create less than significant impacts related to MSAT emissions.

Naturally Occurring Asbestos
During construction in areas that contain naturally occurring asbestos (NOA)-containing rock formations, asbestos can be released into the air and pose a health hazard. The Department of Conservation, Division of Mines and Geology (DMG) has a published guide for generally identifying areas that are likely to contain NOA (DMG 2000). A review of DMG's map showing areas more likely to have rock formations containing NOA indicates that the Fulton Mall site is not in an area that is likely to contain NOA. In addition, the DMG map indicates that there are no areas within City of Fresno are likely to contain NOA. Therefore, disturbance of NOA is not a concern for the implementation of Alternative 1.

Diesel Particulate Matter
Construction activities would also involve the use of diesel-powered construction equipment, which emit DPM. Risk assessments for residential areas exposed to toxic air contaminants (TACs) such as DPM are generally based on a 70-year period of exposure. Construction emissions would occur in 2014 and 2015, and construction is anticipated to be completed within 12 months. Since the use of construction equipment would be temporary and would not be close to the 70-year timeframe, exposure of sensitive receptors to TACs would not be substantial. Emissions of DPM would not be substantial enough to be considered a health risk.

Alternative 2
Less than significant impact. The determination of less than significant impacts on sensitive receptors as described above for Alternative 1 would be the same for Alternative 2.

Cumulative Impacts

Less than significant impact. The implementation of Alternative 1 or 2, which proposed the addition of roadway segments, will redistribute average daily trips. This redistribution will result in a minor increase in traffic volumes along certain roadway segments and decreases along other roadway segments. As described above for Alternative 1, which is also applicable for Alternative 2, the Fulton Mall Reconstruction would result in less than significant impacts on sensitive receptors. In addition, the project's contribution to potential cumulative impacts would be less than cumulatively considerable. Therefore, the implementation of Alternative 1 or 2 would result in a less than significant cumulative impact.

Odors

e) Create objectionable odors affecting a substantial number of people?

Odor impacts on residential areas and other sensitive receptors, such as hospitals, day-care centers, schools, etc., warrant the closest scrutiny, but consideration could also be given to other land uses where people may congregate, such as recreational facilities, worksites, and commercial areas. For the proposed project, the sensitive receptors are residential, recreational facilities, worksites, and commercial areas.

Two situations create a potential for odor impact. The first occurs when a new odor source is located near an existing sensitive receptor. The second occurs when a new sensitive receptor locates near an existing source of odor. The District has determined the common land use types that are known to produce odors in the Basin. These types are shown in Table 16.

Table 16: Screening Levels for Potential Odor Sources

Odor Generator	Distance
Wastewater Treatment Facilities	2 miles
Sanitary Landfill	1 mile
Transfer Station	1 mile
Compositing Facility	1 mile
Petroleum Refinery	2 miles
Asphalt Batch Plant	1 mile
Chemical Manufacturing	1 mile
Fiberglass Manufacturing	1 mile
Painting/Coating Operations (e.g., auto body shop)	1 mile
Food Processing Facility	1 mile
Feed Lot/Dairy	1 mile
Rendering Plant	1 mile
Wastewater Treatment Facilities	2 miles
Source: San Joaquin Valley Air Pollution Control District, 2002.	

According to the Guide for Assessing and Mitigating Air Quality Impacts, analysis of potential odor impacts should be conducted for the following two situations:

- **Generators** - projects that would potentially generate odorous emissions proposed to locate near existing sensitive receptors or other land uses where people may congregate, and
- **Receivers** - residential or other sensitive receptor projects or other projects built for the intent of attracting people locating near existing odor sources.

If the project were to result in sensitive receptors being located closer to an odor generator in the list in Table 16 than the recommended distances, a more detailed analysis including a review of District odor complaint records is recommended. The detailed analysis would involve contacting the District's Compliance Division for information regarding odor complaints. For a project locating near an existing source of odors, the project should be identified as having a significant odor impact if it is proposed for a site that is closer to an existing odor source than any location where there have been:

- More than one *confirmed* complaint per year averaged over a three-year period, or
- Three *unconfirmed* complaints per year averaged over a three-year period.

Project Impacts

Alternative 1

Less than significant impact. The development of Alternative 1 would allow the addition of roadways within Fulton Mall. The addition of roadways are not considered a source of objectionable odors according to the San Joaquin Valley Air Pollution Control District as described above. During project operations, the project could produce odors as a result of increased vehicles within Fulton Mall; however, the anticipated increase in vehicles is not expected to be substantial as addressed in CEQA Checklist Question 3.3 d) above. Therefore, a potential increase in odors from vehicular traffic would be less than significant.

During construction, onsite diesel powered equipment and vehicles will emit diesel particulate matter, which is odorous to some. Also during construction, there would be short-term emissions of ROGs during asphalt paving. These odors will dissipate with distance and should not reach an objectionable level at nearby residences. Impacts would be less than significant.

Alternative 2

Less than significant impact. The determination of a less than significant odor impact as described above under Alternative 1 would be the same for Alternative 2.

Cumulative Impacts

Less than significant impact. The implementation of Alternatives 1 or 2 would not add a source of objectionable odors. Therefore, the contribution of Alternatives 1 or 2 to potential significant cumulative odor impacts would be less than cumulatively considerable, and thus less than cumulatively significant.

3.4 - Biological Resources

A Natural Environment Study was prepared by FirstCarbon Solutions for the proposed project. The following discussion is based on the Study, which is provided in Appendix C of this Initial Study.

Effect on Species

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

The Fulton Mall project site is located within the Downtown portion of the City of Fresno and is surrounded by urban development to the north, south, east, and west. Specifically, the project site is located within a disturbed and developed area characterized by concrete pavement and buildings with scattered ornamental trees. The project site is dominated by one general habitat type, urban/developed land. The entire project site has been previously developed for the construction of the existing Fulton Mall, and associated infrastructure and various buildings. Ornamental trees are scattered throughout the project site, primarily as landscaping along paved pedestrian paths and adjacent to existing buildings. No natural vegetation or habitats occur within the project site, and therefore, no sensitive vegetation or plant species are located within Fulton Mall.

The vegetation present within the project site consists of landscaped ornamental trees such as fig (*Ficus* sp.) pine (*Pinus* sp.), and gum (*Eucalyptus* sp.), with scattered non-native grasses and ruderal (weedy) species including, red brome (*Bromus rubens*), barley (*Hordeum murinum*), and Bermuda grass (*Cynodon dactylon*). These ornamental trees, non-native grasses and ruderal species occur within landscaped and disturbed areas associated with the paved pedestrian paths

Wildlife species expected to occur within the project site include common avian species typically observed in disturbed settings and urban environments such as, northern mockingbird (*Mimus polyglottos*), house finch (*Carpodacus mexicanus*), common raven (*Corvus corax*), and mourning dove (*Zenaida macroura*). Other wildlife species expected to occur onsite include western fence lizard (*Sceloporus occidentalis*) and domestic dog (*Canis familiaris*). The buildings associated with the Fulton Mall may provide suitable roosting habitat for bat species known to occur in the area such as California myotis (*Myotis californicus*). The trees located within Fulton Mall do not provide suitable habitat for tree roosting bat species and none are expected to occur within the landscaped trees within the Mall. Furthermore, Fulton Mall does not provide suitable habitat for sensitive wildlife species.

Project Impacts

Alternative 1

Less than significant with mitigation incorporated. Alternative 1 includes the removal of the pavement and a majority of the trees within Fulton Mall. Approximately four of the existing trees will remain and approximately 140 new trees will be planted as part of Alternative 1.

The proposed Alternative 1 design will occur entirely within the developed land associated with the existing Fulton Mall. The implementation of Alternative 1 will not impact special-status plant or wildlife species known to occur in the region, particularly any state or federally listed species because Fulton Mall does not provide suitable habitat for any special-status plant or wildlife species. However, the existing landscaped ornamental trees located throughout the project site provide potential suitable nesting habitat for several common avian species protected by the Migratory Bird Treaty Act (MBTA) and California Fish and Game (CFG) Code 3500. Therefore, implementation of Alternative 1 could significantly impact nesting birds.

Additionally, the buildings associated with the Fulton Mall may provide suitable roosting habitat for bat species and therefore, construction activities, involving construction noise, may result in indirect effects on bat species, particularly if construction activities occur during the maternity roosting season of May through September. This potential indirect impact on bat species is considered significant.

Mitigation Measures

MM BIO-1 Project activities should avoid the avian nesting season of February through August to limit any potential impacts to nesting birds. If project activities must occur during the avian nesting season, a pre-construction clearance survey must be conducted by a qualified biologist within 30 days prior to the start of construction. If an active nest is discovered during the pre-construction survey, a suitable buffer will be placed

around the nest, typically 250 feet for passerines and 500 feet for raptors, and no activities may encroach into the buffer area without the consent of a biological monitor or until the nestlings have fledge and the nest is no longer active.

MM BIO-2 Construction activity should occur outside of the maternity roosting season, which typically extends from May 1st through September 30th, but can vary based on seasonal conditions. If construction activity must proceed during the maternity roosting season, a pre-construction roosting bat survey must be conducted within 15-days of construction. If an active roost is observed or detected, a suitable buffer would be placed around the active roost and no construction activities may commence without the discretion of an onsite monitoring biologist. If no active roosts are observed, construction activity would have no effect on roosting resident bats and no further measures are required.

After the implementation of Mitigation Measures BIO-1 and BIO-2, potential impacts on nesting birds and potential indirect impacts on roosting bat species would be reduced to less than significant.

Alternative 2

Less than significant with mitigation incorporated. The determination of no impact on special-status plant and wildlife species, potential significant impacts on nesting birds, and potential indirect impacts to roosting bats as described above for Alternative 1 would be the same for Alternative 2. Mitigation Measures BIO-1 and BIO-2 would be required for Alternative 2. The implementation of these two measures would reduce potential impacts on nesting birds and potential indirect impacts on roosting bat species to less than significant.

Cumulative Impacts

Less than significant with mitigation incorporated. The implementation of Alternative 1 or 2 would not impact special-status plant or wildlife species, Alternative 1 or 2 would not contribute to potential cumulative impacts to special-status species. Therefore, the implementation of Alternative 1 or 2 would result in no cumulative impacts to special-status species.

Cumulative development could also result in the removal of trees that provide suitable habitat for nesting birds. The implementation of Alternative 1 or 2 would also remove trees that could be suitable for nesting birds. Cumulatively, the potential impacts are considered significant. The contribution of Alternative 1 or 2 to the potential cumulative impacts to nesting birds is considered significant.

Furthermore, cumulative development could indirectly or directly impact suitable roosting habitat for bats during construction or operational activities. The implementation of Alternative 1 or 2 could also indirectly impact suitable roosting habitat for bats. Cumulatively, the potential impacts to bats are considered significant. The contribution of Alternative 1 or 2 to the potential cumulative impacts to nesting birds is considered significant.

Mitigation Measures

Implementation of Mitigation Measures BIO-1 and BIO-2 are required.

After the implementation of Mitigation Measures BIO-1 and BIO-2, the contribution of Alternative 1 or 2 to potential cumulative impacts on nesting birds and potential indirect impacts on roosting bat species would be reduced to less than cumulatively considerable, and therefore, less than cumulatively significant.

Riparian Habitat

b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

The project site is located within a disturbed and developed area characterized by concrete pavement and buildings with scattered ornamental trees. No native or natural habitats occur within the project site or have the potential to occur within the project site. The project site is located in the central portion of the City of Fresno and is surrounded by urban development to the north, south, east, and west. The entirety of the project site as well as the project vicinity has been previously developed for the construction of the Fulton Mall and associated infrastructure, various buildings and a ballpark. Ornamental trees are scattered throughout the project site, primarily as landscaping along paved pedestrian paths and adjacent to existing buildings. No natural vegetation or habitats occur within the project site.

Project Impacts

Alternative 1

No impact. Since the project site does not have any riparian habitat or other sensitive natural communities, the construction of Alternative 1 would result in no impacts to riparian habitat or other sensitive natural communities.

Alternative 2

No impact. The determination of no impact to riparian habitat or other sensitive natural communities as described above under Alternative 1 would be the same for Alternative 2.

Cumulative Impacts

No impact. Since there are no riparian habitats or other sensitive natural communities within Fulton Mall, the construction of Alternatives 1 or 2 would not contribute to any potential cumulative impacts to these habitats or communities. Therefore, Alternative 1 or 2 would result in no cumulative impacts.

Federally Protected Wetlands

c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

The project site is located within a disturbed and developed area characterized by concrete pavement and buildings with scattered ornamental trees. No native or natural habitats occur within the project site or have the potential to occur within the project site. Additionally, no natural

waterways or drainages occur within the project site. The project site is located in the central portion of the City of Fresno and is surrounded by urban development to the north, south, east, and west. The entirety of the project site and project vicinity has been previously developed for the construction of the Fulton Mall and associated infrastructure, various buildings and a ballpark. Ornamental trees are scattered throughout the project site, primarily as landscaping along paved pedestrian paths and adjacent to existing buildings. No natural vegetation or habitats occur within the project site.

Project Impacts

Alternative 1

No impact. Since the project site does not have any federally protected wetlands, the construction of Alternative 1 would result in no impacts to federally protected wetlands.

Alternative 2

No impact. The determination of no potential for any impacts to federally protected wetlands resulting from construction of the proposed project as described for Alternative 1 would be the same for Alternative 2.

Cumulative Impacts

No impact. Since there are no federally protected wetlands within Fulton Mall, the construction of Alternatives 1 or 2 would not contribute to any potential cumulative impacts to federally protected wetlands. Therefore, Alternative 1 or 2 would result in no cumulative impacts.

Wildlife Corridors and Nursery Sites

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of wildlife nursery sites?

The Fulton Mall project site is located within the Downtown portion of the City of Fresno and is surrounded by urban development to the north, south, east, and west. Specifically, the project site is located within a disturbed and developed area characterized by concrete pavement and buildings with scattered ornamental trees. The project site is dominated by one general habitat type, urban/developed land. The entirety of the project site as well as the project vicinity has been previously developed for the construction of the existing Fulton Mall, and associated infrastructure and various buildings. Ornamental trees are scattered throughout the project site, primarily as landscaping along paved pedestrian paths and adjacent to existing buildings. No natural vegetation or habitats occur within or immediately adjacent to the project site. There are no known mapped or established wildlife movement corridors or nursery sites on or immediately adjacent to the project site.

Project Impacts

Alternative 1

No impact. Since there are no known mapped or established wildlife movement corridors or nursery sites on or immediately adjacent to the project site, construction of the project will not create a significant physical alteration to the land, beyond that which already exists, which would impede the use of wildlife movement through the site. Therefore, Alternative 1 will not have an impact on native resident or migratory fish or wildlife species or established native resident or migratory wildlife corridors. Additionally, Alternative 1 will not impede the use of wildlife nursery sites by wildlife species known to occur in the region such as resident and migratory birds, and mammals such as coyote or mountain lion. Therefore, there is no impact to wildlife movement corridors or nursery site.

Alternative 2

No impact. The determination of no potential for any impacts to wildlife movement corridors or nursery sites resulting from construction of the proposed project as described above under Alternative 1 would be the same for Alternative 2.

Cumulative Impacts

No impact. The project site is located entirely within a developed area associate with the existing Fulton Mall, and surrounded by development associated with the Downtown portion of the City of Fresno. Therefore, there is no potential for the project to result in any impacts to any established wildlife movement corridors or nursery sites. Additionally, the cumulative effects of the project on wildlife movement corridors and nursery sites is not cumulatively considerable due to the fact that the project will not impede the movement of wildlife through the site nor will it result in the cumulative effect of contributing to the overall loss of wildlife movement corridors in the City of Fresno. Therefore, implementation of Alternative 1 or 2 would result in no cumulative impacts to wildlife movement corridors or nursery sites.

Local Policies or Ordinances Protecting Biological Resources

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

The Fulton Mall project site is located within the Downtown portion of the City of Fresno and is surrounded by urban development in all directions. Specifically, the project site is located within a disturbed and developed area characterized by concrete pavement and buildings with scattered ornamental trees. The entirety of the project site as well as the project vicinity has been previously developed for the construction of the existing Fulton Mall, and associated infrastructure and various buildings. Ornamental trees are scattered throughout the project site, primarily as landscaping along paved pedestrian paths and adjacent to existing buildings.

Section 13, Article 3 of the City of Fresno Municipal Code discusses public tree policy and tree preservation within the City of Fresno. The Municipal Code specifically describes three policies that relate to project impacts on public and street trees, the City's Public Tree Policy, Tree Beautification Policy, and Tree Preservation Policy. The Public Tree Policy requires that the city maintain a program

for the planting and preservation of trees on all public property in the city as a municipal affair in order to beautify the city, purify its air, and provide shade for its inhabitants. This article provides for plans and establishes regulations governing the planting and preservation of trees in public property, including parkways of the city. The Tree Beautification Policy includes a Master Tree Plan that specifies the species, spacing, and location of trees to be planted on public property, including parkways of the city. The Tree Preservation Policy requires the City to utilize whatever techniques, methods, and procedures are required to preserve, whenever feasible, all trees in the city including, but not limited to, trees which are affecting surface improvements or underground facilities or which are diseased, or located where construction is being considered or will occur.

Project Impacts

Alternative 1

Less than significant Impact. Alternative 1 will result in the removal of the majority of the trees within Fulton Mall during construction activities; however, as part of the project design, new trees will be planted within the rights-of-way of the proposed streets so that the same number of trees that are removed will be replaced. Since the number of trees that will be removed will be replaced within the right-of-way of the new streets, the implementation of Alternative 1 would result in a less than significant impact of the City's tree policies.

Alternative 2

Less than significant impact. The determination of less than significant impacts to the City's tree policies as described above for Alternative 1 would be the same for Alternative 2.

Cumulative Impacts

Less than significant impact. As the implementation of Alternative 1 or 2 would replace the same number of trees as removed, the contribution of Alternative 1 or 2 to the potential cumulative impact on the City's tree policies would be less than cumulatively considerable. Therefore, Alternative 1 or 2 would result in a less than significant cumulative impact.

Conservation Plans

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

According to the California Department of Fish and Wildlife, the project site is not located within the boundaries of a Natural Community Conservation Plan and according to the California Land Use Planning and Information Network, the project site is not located within the boundaries of a Habitat Conservation Plan.

Project Impacts

Alternative 1

No impact. Since Fulton Mall is not mapped as occurring with any adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat

conservation plan, the implementation of Alternative 1 would not conflict with provisions of any adopted local, state or federal Natural Community Conservation Plan or Habitat Conservation Plan.

Alternative 2

No impact. The determination of no potential impact to an adopted Habitat Conservation Plan or Natural Community Conservation Plan as described above under Alternative 1 would be the same for Alternative 2.

Cumulative Impacts

No impact. Since Fulton Mall is not an area designated within a Habitat Conservation Plan or Natural Community Conservation Plan, the development of Alternative 1 or 2 would result in no cumulative impacts.

3.5 - Cultural Resources

Historic Resource

a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?

Technical reports were prepared to address above-ground historic resources. These reports addressed the existing built environment within and adjacent to Fulton Mall. These reports also addressed a larger area that includes the DNCP and FCSP. The technical reports that were prepared include a historic resource survey and a historic resources impact evaluation. There were two additional historical resources reports that were prepared that include a historic resource evaluation report and a historic property survey report.

The technical reports identified many properties that could be a potential historic resource and other properties that are currently listed on a federal, state, or local registers or lists. Within the Fulton Mall area, there is one historic structure that is on the National Register of Historic Places (Bank of Italy at 1001 Fulton Mall), one structure that is on the California Register of Historic Resources (Pacific Southwest Bank Building at 1060 Fulton Mall), and one landscape that is on the California Register of Historic Resources (Fulton Mall). The technical reports also discussed the presence of a potential district that includes a collection of buildings from similar periods and historic context. The collection of buildings is located within the immediate vicinity of Fulton Mall. There are also eight structures that are located on the local register. Three of the eight structures are the structures that are on the National Register of Historic Places and the California Register of Historic Resources discussed above.

Project Impacts

Alternative 1

Potentially significant impact. The development of Alternative 1 would remove the pedestrian mall throughout the Fulton Mall and introduce two-lane, two-way streets along Fulton Street, Kern Street, Mariposa Street, and Merced Street. This will potentially cause a significant unmitigatable

impact to a resource listed on the California Register of Historic Resources. Potential direct and indirect impacts to existing and potential historic resources will be evaluated in the forthcoming EIR.

Alternative 2

Potentially significant impact. The development of Alternative 2 would remove the pedestrian mall throughout the Fulton Mall and introduce new streets. This will potentially cause a significant unmitigatable impact to a resource listed on the California Register of Historic Resources. The potential direct and indirect impacts to existing and potential historic resources from the implementation of Alternative 2 will be evaluated in the forthcoming EIR.

Cumulative Impacts

Potentially significant impact. Future projects that are consistent with the proposed DNCP and FCSP as well as current development project will be cumulatively evaluated with the implementation of Alternative 1 or 2 to determine potential cumulative impacts to existing and potential historic resources. This evaluation will be provided in the forthcoming EIR.

Archaeological Resource

b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?

The following discussion is based on an Archaeological Resources Assessment Report that includes an assessment of the Fulton Mall. The Report was prepared by Greenwood and Associates and is provided in Appendix D1 of this Initial Study.

Archaeological Setting

Early Period (~12,000 B.P. to 8,000 B.P.)

Little evidence of Early and Middle Sites is found near the City, but there is some evidence for these periods in the San Joaquin Valley. The material culture of the Early Period is characterized by large, fluted projectile points that imply heavy reliance on large game for subsistence, probably supplemented with smaller game and collected plant foods. Few sites from this period have been discovered, and substantial evidence comes mostly from the former shores of Tulare Lake, especially at the Witt Site in southern Kings County. Artifacts are represented in the form of Clovis-like projectile points made from chert, similar to other Pleistocene period sites in North America, as well as various scrapers, chipped crescents, and other stone tools associated with the Fluted-Point and/or Western Pluvial Lakes Traditions. Horse, bison, ground sloth, and human bones were also found at the Witt Site, along with the tusk of mammoth or mastodon. These bones have been radiocarbon-dated to about 11,000 to 13,000 B.P.

Middle Period (8,000 B.P. to 2,500 B.P.)

An examination of lithic tools from the Early and Middle Periods shows little difference between the two. Stone tools from the Middle Period, in fact, look very similar to the Western Pluvial Lakes Tradition associated with the Great Basin. The Middle Period, however, is associated with an increase of groundstone tools, such as metates and manos, reflecting an increased dependence on

vegetative species requiring processing, such as seeds and nuts. Lithic technology, for the most part, remains relatively unchanged.

Late Period (2,500 B.P. to Ethnohistoric Present)

During the Late Period, patterns in material culture experienced dramatic change, much of which was observed and recorded, but simultaneously caused, by Europeans during the later part of the period. The Late Period also marked the increase of diversity in material culture. Both the *Olivella* shell bead and bow-and-arrow technology made their first appearances in the area. People buried their dead in a flexed position much more frequently, and burial goods were numerous compared to previous periods. Occupation sites were larger, reflecting semi- sedentism, and there was great reliance on groundstones, particularly mortars and pestles, indicative of increased dependence on nuts, seeds, and acorns. Mortars and pestles during this period were much more finely produced compared to the Middle Period. Objects such as bird- bone whistles, steatite pipes, very small and serrated projectile points, obsidian from eastern California, and rectangular *Olivella* beads appeared for the first time.

Assessing the region's prehistoric settlement patterns has been problematic, since most of the excavations done in the San Joaquin Valley have been restricted to later-period Yokut burial sites. Larger scale projects have been limited to Buena Vista Lake and San Luis, Los Banos, and Little Panoche reservoirs. Wallace has stated that the region surrounding Fresno "remains one of the least-known archaeological areas in California." Nonetheless, evidence points to the likelihood that most occupations were on or near now-extinct lake shorelines to maintain resources, with interruptions related to dry climatic intervals, particularly A.D. 1000 to A.D. 1500. After A.D. 1500, most populations settled in the southern and western parts of the San Joaquin Valley.

Ethnographic Setting

Fresno is located in the San Joaquin Valley on land once inhabited by the Yokuts, and according to Wallace the City is plotted in an area that divides the Northern Valley Yokuts (mostly the upper San Joaquin River and northward) from the Southern Valley Yokuts (mostly the upper Kings River and southward.) Wallace plots a Northern Yokuts tribelet village known as *Wakichi* south of Friant, and he plots a tribelet village from the Southern Yokuts known as *Wechihit* near Sanger.

Northern Valley Yokuts

The North Valley Yokuts occupied an area that extended to the Sacramento River Delta on the north, the crest of the Diablo Range to the west, and the lower foothills of the Sierra Nevada to the east. Their disappearance was brought about by disease and dislocation due to aggressive missionization during the late 1700s and early 1800s, the Gold Rush of the 1840s and 1850s, and American expansion thereafter. The little that is known of them today is based mostly on the accounts of non-Native explorers and missionaries.

The Northern Valley Yokuts subsisted primarily on resources present along the San Joaquin River and its associated channels. The vegetation was sparse in the valley, aside from marsh grass and tules, and trees were limited to small patches of sycamores, cottonwoods, and willows. Tule roots and seeds found throughout the valley served as important food staples. In addition, valley oaks could be found in groves in areas of great water abundance and nutrient- rich soil. Acorns from these oaks

formed an important dietary staple, and were ground into a powder using a mortar and pestle, and subsequently leached of toxins in waterways. The leftover resulting paste was then cooked and consumed. Fauna was abundant in the riverine areas, and fish, freshwater mollusks, turtles, and waterfowl were important food sources. Tule elk, pronghorn antelope, jackrabbit, squirrels, reptiles, and a variety of birds were also consumed.

The Northern Valley Yokuts lived in semi-autonomous patrilineal villages that were led by a headman and typically averaged around 300 persons. They spoke various dialects of the Penutian language stock. The Yokuts' dwellings were small, round structures formed of light wooden poles covered with woven tule mats. Villages often included a lodge for community functions, as well as a sweathouse. The local village economy involved the production of baskets and mats made of tule stalks, stone mortars and pestles, projectile points and stone tools made from local chert, jasper, chalcedony, and imported obsidian, and bone tools such as the awl. Ceramic production was likely not emphasized and secondary to other goods.

Trade was active with neighboring groups, as the Northern Valley Yokuts transported goods on watercraft made of tule along the San Joaquin River and its tributaries. Overland trails to the territory of the Salinan and Costanoan tribes on the Central California coast were also maintained. Domesticated dogs were given to the Miwok in exchange for baskets, bows, and arrows, and the Costanoans supplied the Yokuts with mussels and abalone shells.

Villages were settled primarily on the top of low mounds and near large sources of water, where they were somewhat protected from springtime flooding as snow melted from the Sierra Mountains. Their close proximity to water sources helped foster sedentary lifestyles and long- term occupation of the villages. Occasionally, flooding and food shortages forced the inhabitants to move their village to another site until conditions improved. When food shortages were less severe, able-bodied individuals went out to collect wild plants and seeds as their elders stayed behind.

The population of the Northern Valley Yokuts dramatically declined after European contact. Contact with Spanish explorers and missionaries during the Spanish-Mexican period (1769-1846) brought on disease, erosion of traditional native culture, and displacement of natives from their lands. Remaining populations were eventually incorporated into the Mission system, which further continued the devastation of the native cultures. Some Yokuts escaped the mission system and became fugitives at risk of being captured or killed. Even with the transfer of land from Spain following Mexican Independence in 1822, native populations were pushed into marginal parts of the land, and food became scarce. Relationships between native groups and encroaching ranchers became even more strained as natives began stealing livestock and horses in desperation. The incorporation of California as a State in 1846 and the California Gold Rush of 1849 only hastened the decline of Native American culture. The remaining Yokuts were pushed from their lands, usually in the face of violent opposition from white settlers, who eventually took some of the Indians for laborers on ranches and farms. By the time the United States government set aside land in the Fresno and Tule River Reserve, the Yokuts and other native peoples had nearly disappeared. Few descendants of Northern Valley Yokuts survive today.

Southern Valley Yokuts

Ethnographic evidence suggests the City of Fresno is located in the northernmost part of the Southern Valley Yokuts territory. At the time of European contact, most of the San Joaquin Valley and the foothills of the western slope of the Sierra Nevada were occupied by 40 or so groups classified together as the Yokuts with a Foothills division and a Valley division of language dialects. The Yokuts were recognized as having three major subgroups: the Northern Valley, the Foothill, and the Southern Valley. Each of these ethnolinguistic groups was composed of autonomous, culturally and linguistically related tribes or tribelets.

Alfred Kroeber divided his tribal classification system into Valley Division and Foothill Division based on ethnographic lines, geographic habitat, and language dialect. He saw the Foothill Division world-view and economy influenced more by their Shoshonean neighbors than the Valley Yokuts. Later, William Wallace divided the Yokuts into three subgroups, Southern Valley, Northern Valley, and Foothill, and shifted the known tribelets among these divisions. The following is a review of ethnographic information associated with the Southern Valley Yokuts.

The Southern Valley Yokuts occupied a rich environment with abundant water resources from the nearby sloughs, lake basins, and river systems. Swamps and tule marshes surrounded the waterways and teemed with wildlife, including aquatic mammals, fish, and waterfowl. Adjacent grasslands provided food for herds of elk, antelope, and (in the winter) deer. The regional flora was equally if not more diverse and was utilized as a main staple of the Yokuts diet. The Southern Valley Yokuts dietary base relied on a mixed strategy of fishing, waterfowl hunting, shellfish, and plant collecting, with less emphasis on large-game hunting. Important vegetal resources included cattail roots, grasses, nuts, seeds, tule, and bulbs. The resource-rich environment allowed for permanent village sites, which typically were occupied throughout the year.

Resources not found in the local environment were obtained through an extensive trade network, which had begun to develop during the Late Holocene. Quality stone and wood were lacking in the Valley environment and were often acquired through trade with nearby tribes. Imported items included acorns, salt, obsidian, and seashells, which were exchanged for locally available asphaltum, steatite, and animal skins.

The material culture of the Southern Valley Yokuts included structures, watercraft, basketry, weapons, and tools fashioned primarily from local resources. The ubiquitous tule was the primary component utilized for house construction and other fiber crafts such as basketry, mats, and cradles. Rafts were central to the economy base because of the abundance of waterways, which made watercraft the preferred mode of transportation. Wood, stone, and bone were commonly used to manufacture a variety of tools and weapons. Sweathouses were common to every settlement and, in the case of the Southern Valley Yokuts, were used exclusively by men on a daily basis.

The Southern Valley Yokuts were divided into true tribes, with individual tribelets having their own name, dialect, and territory. Typically, a tribelet was ruled by a central chief who inherited the position, was assisted by one or more aides, and lived in the largest village. The chief's duties included decisions that affected the well-being of the entire tribelet, sanctioning trade, entertaining guests, and arbitration of intra-tribal disputes. Marriage was typically informal, and patrilocality was

the accepted practice following marriage. Thus, if a family had numerous sons, a circle of extended family members would inhabit the area immediately adjacent to the patriarch's home. Polygamy was not objected to, but it was practiced solely by men. There is scant evidence that the Southern Valley Yokuts participated in a large number of organized religious ceremonies.

Historic Archaeological Setting

Spanish-Mexican Period

The nineteenth century opened with a wave of exploration into the San Joaquin Valley that eventually led to the settlement of Fresno County. Members of an 1806 expedition led by Spanish explorer Lt. Gabriel Moraga were perhaps the first Europeans to pass through present- day Fresno County. Between 1806 and 1813, Moraga guided several additional expeditions during which he discovered and named the county's two major waterway, the San Joaquin and Kings Rivers. However, Moraga's search for potential new mission sites ultimately proved fruitless and the region remained well beyond the administrative reach of the established missions. Despite these early forays, the valley's inhospitable environment deterred permanent settlement. With the onset of the Mexican War in 1846, Central California came under the control of the United States. However, it wasn't until the discovery of gold in California that miners and other settlers were ultimately drawn to the region in search of riches. In the early 1850s, minor quantities of gold were discovered along the San Joaquin and Kings Rivers and their tributaries in the Sierra foothills and the resulting gold camps and mining districts became part of the southernmost Mother Lode gold region.

Early Immigrant Settlements

The county's first substantial settlements rose in the foothills; foremost among them was Millerton. When Fresno County was created from portions of Mariposa, Merced, and Tulare counties in 1856, Millerton served as the first governmental seat. It remained the county seat until 1874 when it was moved to the rising, and more centrally located, city of Fresno. In 1869 nearly the whole of Fresno was owned by one land speculator, which was part of a State-wide trend in the 1860s. The greatest of these speculators was William S. Chapman, who held title to most of the properties in this portion of the County after the Civil War. The low-lying area now occupied by downtown Fresno was once known as the "Sinks of Dry Creek." Nearby, rancher Anthony Easterby purchased roughly 5,000 acres of land bounded by what are now Chestnut, Belmont, Clovis, and California Avenues in 1867, although the BLM search demonstrated that these lands were owned by Chapman. Easterby and neighboring rancher, Moses J. Church, were convinced that, with irrigation, the soil was fertile enough to support crops. They conceived an irrigation system that would convey water from the creeks emerging from the foothills of the Sierras to the Fresno plain. In 1871, Easterby hired Church to complete the county's first canals, known as "Church's Ditches" and began raising wheat. The Central Pacific Railroad selected a site west of the Easterby ranch for a depot location as it charted the path of its new line south along the shoulders of San Joaquin Valley in 1870. The line would eventually become the first to connect northern and southern California.

Expanding Development In Fresno

The Contract and Finance Company, real estate arm of the Central Pacific, acquired 4,480 acres around their depot site with the intention of developing an agricultural center. A street grid oriented parallel to the northwest-southeast running tracks was platted and land donated for the new

community's courthouse. The name selected for the depot and new town was Fresno Station. "Fresno" is derived from the Spanish word for ash tree. Numerous regional features were so named by early Spanish explorers who found many such trees growing along the waterways in the otherwise desolate region.

The town site was surveyed and divided into "302- by 400-foot blocks, with 25- by 150-foot lots and twenty-foot alleys." The rail alignment bisected the street grid and Silvia Avenue (present-day Divisadero Street) formed the northern boundary. The Court House and Civic Center were centrally located and took up four city blocks. The streets running northwest to southeast were given letter names, while the southwest to northeast running avenues were named for California counties. The asking price of individual lots ranged from $60 to $250 depending on their proximity to the civic center and the railroad tracks. Due in part to the new town's isolated location in a desert region of the San Joaquin Valley, there were few buyers initially. The railroad resorted to allowing the first new settlers to take up residence on selected land and pay later if they decided to remain on it. The incentive proved effective; the town grew and land values rose quickly.

In the spring of 1872, the railroad tracks to Fresno were completed, connecting it with the outside world. By 1874, the town boasted 55 buildings, including "four general stores, two fruit stores, one drugstore, three hotels, two restaurants, six saloons, two law offices, two physicians, one tinsmith, one saddle shop, two butcher shops, three blacksmiths, one tailor, the Expositor (newspaper), and twenty-five private residences." In 1875 the first brick building in town was constructed on Mariposa Street by Otto Froelich.

The first commercial district emerged along Front Street (present day H Street) and the railroad tracks at the heart of the area that is now referred to as the Central Area or Central Business District. The original train station was located on H Street at Tulare. It was replaced in 1889 with a larger station located on the same site. Largely because of its position on the new railroad line, Fresno quickly grew in population and stature. County residents called for a change in the county seat from Millerton to Fresno, and this was accomplished with a special election on March 23, 1874.

By the early 1870s, when farming was gaining importance throughout all of California, speculators viewed the unplowed landscapes as an untapped source of potential profits and began to devise a systematic approach to marketing large acreages by claiming water rights from nearby creeks and rivers then establishing "cooperatives" to potential farmers. In 1875, the Central California Colony was created south of Fresno. Investors purchased large tracts of land cheaply, which they then subdivided and marketed to small- scale farmers. To enhance the appeal of their offerings, the stakeholders typically built irrigation canal systems and roads - often attractively landscaped with rows of palms, eucalyptus, or other trees - which improved the colony's appearance while also aiding agricultural production and shipping. Although the first colonies were established in 1875 and 1878, the major period of colonization in Fresno County was the 1880s. By 1903 there were 48 separate agricultural colonies in Fresno County.

Late Nineteenth Century Growth

The agricultural richness of the surrounding region fueled Fresno's growth and importance as a shipping hub. Incorporated as a city in 1885, Fresno experienced rapid expansion of its urban core

during the last two decades of the nineteenth century. From 1880 to 1885, the population more than tripled from 1,112 to 3,464 inhabitants, and by 1900 it had reached 12,470. Lands surrounding the original town site boundaries were quickly snapped up by speculators and subdivided as a result of this population growth.

The first major expansion of Fresno's street grid occurred in 1880, when the Villa Homestead Tract was added to the northeast of the original town site. This addition and all subsequent ones were laid out aligned with the cardinal directions rather than oriented to the Central Pacific's tracks, resulting in the many oddly shaped parcels and skewed intersections that today demark the boundaries of the city's historic core. Subdivisions within what is now the Fulton-Lowell subarea developed beginning in 1884. Chief among the next waves of development were North Park, and West Fresno. In 1910, the Alta Vista Tract, bounded by Balch, Cedar, and Platt Avenues, and First Street was added east of the downtown.

Sanborn insurance maps recorded land use in Fresno from the beginning of 1885. The earliest maps depict scattered development throughout an approximately six-block radius of the Southern Pacific Railroad depot, which was located along H Street between Mariposa and Tulare Streets. Mariposa Street had emerged as the principal commercial thoroughfare, and the 1885 maps illustrate fully built out blocks of brick and wood frame row buildings housing shops, lodging houses, banks, offices, restaurants, and saloons beginning at H Street near the train depot and extending to the northeastward for three full blocks to K Street (Van Ness). Additional commercial row development along H Street faced the train station. Residential development in early Fresno was concentrated in the area between Mariposa and Merced Streets, and between Tulare and Inyo Streets to the southeast.

As might be expected, the town's early industry was predominantly oriented to agriculture. Fresno's historic 'Chinatown' was also well established by 1885, located immediately southwest of the Southern Pacific tracks. By the 1890s, there was a substantial Japanese population in this area as well. Fresno's economy was flourishing in 1887 and real estate transactions during that year reflected the impact of the statewide boom of the late 1880s. During the month of April alone, the county recorder reported 375 deed transactions totaling in excess of one million dollars. Relatively inexpensive land prices continued to draw new settlers to the area and played a role in the ongoing economic prosperity. Beginning about 1888, land sales began to move beyond the city limits, especially to the north and east, and there was expansion of both the residential and commercial areas of the city.

By 1888, additional residential development had occurred north of Merced Street along Tuolumne, Stanislaus, Calaveras, H, I, J, and K Streets. At that time, dwellings had also gone up along Tulare, Kern, Inyo, Mono, and Ventura Streets, and H, I, J, K, L, M, and N Streets, east of Mariposa Street. Between 1887 and 1890, the Fresno Water Company integrated and substantially expanded the town's loose patchwork of water supply infrastructure, building Fresno's first pumping station and water tower, and laying out 4-inch wrought iron water mains. Some of these original "permanent pipes" are still in use. By 1890, the city population was estimated at just under 11,000.

Fresno History, 1900-1929

The first three decades of the 20th Century were a period of steady growth and increasing prosperity for Fresno during which the city established itself as the primary city of the San Joaquin Valley. The City's first electric streetcar was in use in 1902. By 1909, the first double- track streetcar line was installed along J Street. By the early 1920s, streetcar lines would radiate out from the central business district to the north, east, south, and west where farmland was being subdivided for suburban development. The expanding transit infrastructure, along with exponentially increasing private automobile ownership, made living further from the city center possible. Land within the central city increasingly became used for commercial and civic purposes.

Three important civic buildings were constructed Downtown in the decade just after the turn of the century. The first, the Fresno Public Library, was built on the east side of I Street between Merced and Tuolumne with a $30,000 Carnegie grant. Completed in 1904, the Fresno Carnegie Library was one of the earliest and costliest in the Carnegie system. Architects Copeland and Dole of New York designed the building in the Classical Revival style. The Carnegie Library was demolished in 1959.

In 1907, the first purpose-built City Hall was constructed just down the street from the library at the southeast corner of I Street and Merced. A new Post Office was constructed at the northwest corner of Tulare and Van Ness. These substantial and architecturally distinguished buildings signaled that Fresno had moved beyond its early nascent stage.

Concurrently, Fresno's central business district experienced a building boom during the early part of the 20th century. The 1906 Sanborn Maps show the central commercial corridor expanded along I and J streets both north and south of Mariposa between Tulare and Fresno streets. By 1919, the concentration of buildings on both streets reaches north to Tuolumne and south to Inyo with stores, restaurants, offices, banks, hotels, and theaters are all represented. That same year, I Street was renamed Broadway and K Street was renamed Van Ness Avenue. In commemoration of Fresno business man Fulton G. Berry, J Street was renamed Fulton Street in 1923. The newly named Fulton Street had been Fresno's established "Main Street" for years, the preferred location for the Valley's major consumer retailers.

Led by the fruit packing industry, the City's industrial areas continued to expand in the 20th century. Large parcels south of the Central Pacific tracks were developed with packing houses, storage warehouses, and drying sheds. Fruit and produce wholesalers Hobbs-Parsons Company operated several warehouse and packing facilities. Their 1903 produce warehouse at the corner of H Street and Tulare remains in place today and has been designated a historic resource by the City.

Many of the businesses identified on the early Sanborn Maps indicate branch operations of statewide, national and international companies. The California Fruit Canners Association Fresno Branch Cannery No. 16 was located on H Street between Ventura and San Benito streets. The Association was the result of a merger of California's major fruit canners. In 1916, they became the California Packing Corporation or CALPAK, marketing products under the Del Monte brand.

The Rosenberg Brothers Company operated a large raisin and dried fruits packing house (previously operated by the H.L. Hobbs Company) at the northwest corner of G Street and Mono. The Rosenberg

Brothers were the founders of the Bear Creek Corporation of Medford, Oregon, marketing fruits and nuts as gifts under the “Harry & David” brand. Another organization whose name appears on early 20th Century Sanborn maps is the California Associated Raisin Company (CARC) whose success would bring the San Joaquin Valley and Fresno international recognition. CARC was a cooperative organization formed in 1912 by a group of San Joaquin Valley raisin growers to gain greater market share and combat fluctuating prices and demand. Growers sold their raisins to CARC for a guaranteed price and then shared in any net profit, less a fee to run the organization and pay a dividend to shareholders. CARC would be responsible for packaging the raisins and promoting their use throughout the country.

In 1915, CARC began marketing their raisins under the “Sun-Maid” brand name. A painted image of a young girl wearing a red sun bonnet and holding a tray of freshly picked grapes became the company’s trademark, reproduced on raisin boxes and all manner of promotional materials. The model for the image was a local Fresno girl named Lorraine Collett Peterson who worked part time for a packing company. Along with a group of other "Sun Maids" employed by the firm, Miss Peterson made personal appearances to promote the raisins, while magazine and newspaper ads emphasized the benefits of raisins dried naturally by the sun versus mechanical or chemical drying. Recipe booklets and other materials helped increase Americans' consumption of raisins significantly. CARC also employed a national team of agents to sell raisins directly to grocers, reducing the need for an outside distribution network. This sophisticated integration of advertising, public relations and sales efforts was enormously successful.

In 1918, CARC opened a huge processing and packing plant at the corner of Hamilton and Pearl streets just south of the Fulton Corridor. CARC's name was officially changed to Sun-Maid Raisin Growers of California in 1922, reflecting the success of its national branding efforts. Sun Maid would continue operating the Fresno plant until 1964.

In addition to fruit packing, other industrial activities during this period included grain storage, general merchandise warehousing, lumber yards, beer and soda bottling, soap manufacturing, and a machine foundry. The Danish Creamery Association began operating a dairy products processing facility at the corner of E Street and Inyo sometime before 1919. Dairy products are still processed today at the site by California Dairies, Inc. including butter under the Danish Creamery brand name.

The area north of the railroad tracks and northwest of the central business district also began to change dramatically during the second decade of the 20th Century where commercial and light industrial uses, including a large number of automobile service businesses, began to replace the residential properties originally constructed there.

By the end of the 1920s, Fresno had transformed into a thriving city at the center of the United State’s most productive agricultural region. The downtown was fully established as the San Joaquin Valley’s primary marketplace offering office, retail, lodging, dining, and entertainment facilities. Adjacent industrial activity enabled agricultural goods to be processed and shipped to distant consumers. The central city’s residential areas had largely been developed. Residential properties were increasingly redeveloped for commercial uses as the City’s wide-ranging streetcar system and increased private automobile ownership allowed more of Fresno’s citizens to live outside of the city

center. Fresno, along with the nation, appeared increasingly prosperous. Then on November 24, 1929, the New York Stock Exchange crashed and millions of dollars in stock value vanished. The stock market crash exposed structural weaknesses in the banking and finance systems, key industries, and the economy as a whole, ushering in the Great Depression.

Fulton Mall Regional Area Historic Archaeological Environmental Setting

The Project is located in a portion of the City that saw the earliest developments along the Central Pacific tracks, including the origination point of development (the railroad stop at Tulare and H), plus properties that were sold off by Chapman for the various agricultural colonies to the southwest. As the City developed, land development pressures were focused southwest of the tracks (Chinatown), and east of and paralleling the tracks (Germantown and Armenia Town). Central downtown blocks quickly became the managerial core of the town, while development of homes expanded for the most part to the north and east.

As the downtown area filled out during the late 1880s, both commercial and residential buildings could be found along K Street (later Van Ness), between Tulare and Inyo streets. More outlying residential areas, such as those along O Street, were still in relatively rural settings. With land within the city limits bringing premium prices, the City began to annex additional property for commercial and residential development. In 1887, the City annexed the first addition, the Woodward Addition, which was located at the southern end of the community; however, the greatest growth during this period was directed to the north and west of the city limits. The Lowell neighborhood developed north of Divisadero Street during Fresno's rapid growth period, from the mid 1880s through 1910. Demographically, the area was somewhat unique, in that upper, middle, and working class families all resided within it. Working class enclaves developed bordering the more affluent areas of the Lowell neighborhood. Contrary to the social and economic segregation typical of many parts of the country, Fresno saw affluent families residing only one street away from working class enclaves.

The land in the western portion of the study area, west of the original town site of Fresno began to be developed in the 1880s. The Western Addition of Fresno was subdivided in February 1882. The Western Addition included lands extending from Belmont Avenue on the north to Whites Bridge Road on the south, and west from Tehama Street to Thorne Avenue. In 1888, the West Fresno Addition was annexed, and in the ensuing years, more tracts were developed, marketed, and eventually annexed to the city of Fresno.

By 1900 the population of Fresno had reached 12,470 people, and the city drafted its first charter. During the following decade agriculture continued to flourish, with cotton growing and sweet wine production emerging as new industries. Fresno became the residential and commercial center of an increasingly prosperous region. Key to Fresno's further outward expansion was the introduction of street car and trolley lines, which carried passengers to different parts of the City and attracted business to the area. In 1889, the Fresno Street Railroad franchise first introduced service. Other franchises followed, carrying passengers in horse- and mule-drawn, mostly antiquated, second-hand trolley cars from San Francisco. In 1903, the Fresno Traction Company introduced Fresno's first electric streetcar line, and in 1909 the City's first double track line was installed on J Street (now Fulton Street).

In the eastern reaches of Fresno, early development was concentrated in the vicinity of the Fresno County Fairgrounds, particularly north of Ventura Avenue. There were fully built-out residential tracts in that area, extending as far east as Chestnut Avenue, by the early 1920s. Roeding Park, in the northwest portion of the DNCP area, came into being with the donation of 118 acres of land to the city by German immigrant, farmer, and nurseryman Frederick Roeding and wife Marianne between 1903 and 1908. An adjoining 40 acres, present location of the zoo, was acquired by the city in 1924. Fresno Chaffee Zoo began casually as a collection of unwanted pets and other animals around 1908. It received accreditation as the Roeding Park Zoo in 1929.

Highway 99, the main north-south route through Fresno and the San Joaquin Valley, had its origins as Route 4 in the 1910s. Built to accommodate the growing number of automobiles, it was among the state's first paved overland routes. It was officially designated US Highway 99 in 1926 and acquired the title "Golden State Highway" in 1927. The early highway followed the present alignment of Golden State Boulevard northwest of the downtown, and prior to World War II, its path north of Roeding Park emerged as an early "motel row," lined with motor courts and tourist camps.

Following World War II, the passage of the G.I. Bill enabled returning veterans to purchase homes and establish businesses, prompting another period of rapid expansion. The Mayfair subdivision, completed in 1947 northeast of the Project Area, included Fresno's first suburban shopping mall and ushered in an era of development at the suburban fringe. Between 1940 and 1950, the City's population grew by 30,000, with much of the growth accommodated in new auto-oriented suburbs. The Interstate Highway Act of 1956 served to spur development of suburbs, and ultimately led to the economic decline of many inner cities. The City attempted to remedy the decline of downtown Fresno with the issuance of the 1960 General Plan.

Downtown Fresno Districts

There are a series of (historic archaeological) Districts within Downtown Fresno. These districts are among the oldest, most diverse, and most densely developed areas in the City of Fresno. The boundaries of the districts were determined primarily by the unique character of each district, which in turn was based largely upon their physical form at the time they were built and the role each played in the context of the City. There are seven distinct districts within the area known as the Fulton Corridor Specific Plan (FCSP), and include the Central Business District (District 1), the Cultural Arts District, the Civic Center , the South Stadium District, the Chinatown, the Armenian Town/Convention Center and the Divisadero Triangle.

The Fulton Mall is located within the Central Business District. This District has moderate-to-high potential for buried historic archaeological sites. This District is not known to contain any prehistoric resources.

Findings

Future development in the Central Business District is expected to infill vacant land rather than tear down and replace historic-era buildings. Although replacement of structures near the Fulton Mall is always a future possibility, replacement of the Fulton Mall itself could expose buried historic archaeological resources.

Based on a records search, no known archaeological resources are located in the project area, nor have any archaeological surveys taken place within the Project site.

Based on the Archaeological Resources Assessment Report, the Fulton Mall was determined to have moderate-to-high archaeological sensitivity. Moderate-to-high was determined by finding that: maps indicate that historic buildings of heavy construction have been removed; site may or may not have surface disturbance, e.g., site of brick commercial/industrial/residential building with basement covered by pavement or, site of brick commercial/industrial building with no basement and no subsequent surface disturbance known. Because the whole of the Fulton Mall was built over, and because the Mall area was determined to have a moderate-to-high sensitivity, there is a possibility that unknown archaeological resources could be located in Fulton Mall.

Project Impacts

Alternative 1

Less than significant impact with mitigation incorporated. As discussed above, no historic archaeological resources are known to exist in the project site, and therefore, the construction of Alternative 1 would result in no impacts to known archaeological resources. Because the project site was determined to have a moderate-to-high sensitivity, there is a possibility that unknown archaeological resources could be located in Fulton Mall. Therefore, construction activities that involve subsurface excavations associated with Alternative 1 could possibly result in significant impacts to unknown archaeological resources.

Mitigation Measure

MM CR-1 It has been determined that there is a potential for buried archaeological sites in the project site. Construction activities shall be monitored by an archaeologist who meets the Secretary of Interiors Professional Qualification Standards for Archaeology and Historic Preservation. Prior to construction, a monitoring plan shall be developed and approved by an archaeologist who meets the Secretary of Interior's Standard. The monitoring plan shall incorporate the construction plans and include methods necessary to mitigate for impacts should buried archaeological sites be encountered.

The implementation of the above mitigation measure would provide monitoring for excavation activities to reduce potential impacts to unknown archaeological resources to less than significant.

Alternative 2

Less than significant impact with mitigation incorporated. The determination of less than significant impacts with the incorporation of mitigation measures for archaeological resources as described above under Alternative 1 would be the same for Alternative 2.

Mitigation Measure

Implementation of Mitigation Measure CR-1 is required.

The implementation of the above mitigation measure would provide monitoring for excavation activities to reduce potential impacts to unknown archaeological resources to less than significant.

Cumulative Impacts

Less than significant impact with mitigation incorporated. Cumulative development in Downtown Fresno is not expected to result in any impacts to known archaeological resources. However, cumulative development could impact unknown resources. This potential impact is considered potentially significant. The implementation of Alternative 1 or 2 could also result in significant impacts to unknown resources, therefore, the contribution of Alternative 1 or 2 to potential cumulative impacts on unknown archaeological resources is considered cumulatively significant. Thus, Alternative 1 or 2 could result in a significant cumulative impact.

Mitigation Measure

Implementation of Mitigation Measure CR-1 is required.

The implementation of the above mitigation measure would provide monitoring for excavation activities to reduce the project's contribution to potential cumulative impacts to unknown archaeological resources to less than cumulatively significant.

Paleontological Resource or Geologic Feature

c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

The following discussion is based on a Paleontological Resource Assessment prepared for the proposed Fulton Mall Reconstruction Project. The Assessment was prepared by FirstCarbon Solutions based on records search conducted by Dr. Ken Finger. The Assessment is provided in Appendix D2 of this Initial Study.

Topography

The Fulton Mall project study area consists predominantly of developed land consistent with the characteristics of an urban center. Single- and multi-story buildings are located throughout the project study area. Fulton Mall and the Cross Malls consist of paved pedestrian pathways. The project study area has generally flat topography at an elevation of approximately 290 feet above mean sea level.

Climate

The City of Fresno has an "inland Mediterranean" climate including long, hot, dry summers and short, foggy winters with low rainfall. The average winter temperatures are in the high 50s degrees Fahrenheit (°F); temperatures below freezing are unusual. Average summer temperatures are in the 90s°F; however, over the greater Fresno area the average is 95°F. Many summer days have highs exceeding 100°F. The City of Fresno experiences, on average, a little more than 10 inches annual precipitation.

Soils

The general soil profile within Fulton Mall study area consists of four separate soil series: Delhi loamy sand, Hanford sandy loam, Madera loam, and San Joaquin sandy loam. The soils within the majority of the study area have been altered from their natural state because of grading and compaction for the construction of the existing Fulton Mall and adjacent buildings and infrastructure. It is uncertain just how deep undisturbed terrain is located below the pavement of the existing Fulton Mall.

Paleontological Resource Assessment

The City of Fresno was reviewed for geology and paleontological sensitivity. The geologic maps of Matthews and Burnett (1965), Page and LeBlanc (1969), and Marchand and Allwardt (1978) indicate that the entire area of concern consists of Quaternary alluvium. Matthews and Burnett (1965) mapped the surface of the project area as Pleistocene non-marine (Qc) and Quaternary non-marine fan deposits (Qf), the former having been more recently been referred as the Riverbank Formation and the latter consists of undifferentiated Pleistocene-Holocene alluvial sediments, respectively.

Based on a database records search at the University of California Museum of Paleontology (UCMP), three Pleistocene Riverbank Formation localities (#V4401, #V65100, and #V81121) were found in surrounding Fresno County, all of which yielded elements of the Rancholabrean (late Pleistocene) vertebrate fauna. Locality #V81121 is referred to the Riverbank Formation, whereas the other two units are unnamed. Locality #V4401 (Tranquility) accounts for 149 of the 151 specimens listed. Numerous specimens have been have been published, several of which are types for their species. The recovered faunal assemblage includes pond turtle (*Clemmys marmorata*), rattlesnake (*Crotalus*), loon (*Gavia*), broad-footed mole (*Scapanus latimanus*), jackrabbit (*Lepus*), vole (*Microtus*), wood rat (*Neotoma*), pocket gopher (*Thomomys*), badger (*Taxidea*), grey fox (*Urocyon*), true fox (*Vulpes*), coyote (*Canis latrans*), horse (*Equus*), bison (*Bison*), elk (*Cervus*), and mule deer (*Odocoileus*). Among these are type specimens of *Clemmys marmorata*, *Scapanus latimanus*, and *Canis latrans* that have been documented in scientific publication. The UCMP database also records 12 plant localities in Fresno County, in the Pleistocene alluvial deposits of the Modesto, Riverbank, and Turlock Lake formations.

All undisturbed Pleistocene alluvium in the surface and subsurface of the area has the potential to contain significant paleontological resources that could be impacted by project-related excavations. Fossils tend to be spottily distributed in alluvium, occurring primarily in pointbar and floodplain deposits. Nevertheless, all Pleistocene alluvium, including undifferentiated Pleistocene-Holocene fan deposits, are considered to have a high paleontological sensitivity.

The whole of the Fulton Mall Reconstruction area is located on Quaternary non-marine fan deposits (Qf), with Pleistocene non-marine (Qc) located about 0.25 mile to the southeast. Since the Quaternary non-marine fan deposits overlie the Pleistocene non-marine deposits at uncertain depth at the project site, it is not known—until cuts are made—at what depth the Pleistocene non-marine deposits will be encountered.

Project Impacts

Alternative 1

Less than significant impact with mitigation incorporated. Construction activities associated with Alternative 1 would require reconstruction activities that would include excavation cuts up to 5 and 15 feet below modern grade. Grading activities that occur between modern grade and 5 feet below modern grade are expected to be disturbed given that Fulton Mall has undergone previous grading activities when the pedestrian mall and related utility improvements were constructed in the 1960s. Therefore, there would be no impacts to paleontological resources from excavation to 5 feet below modern grade.

During excavation activities that take place more than 5 feet below modern grade, there is the potential that such cuts could impact undisturbed Pleistocene and/or Quaternary deposits, and it is this undisturbed terrain that may contain locally significant fossil deposits. Therefore, Alternative 1 could result in significant impacts to unknown paleontological resources during excavations 5 feet below modern grade.

Use of the conversion of Fulton Mall to a street network under Alternative 1 would not result in long-term impacts on unknown paleontological resources because no long-term disturbance of undisturbed terrain would occur.

Mitigation Measure

MM CR-2 Prior to the issuance of grading permits, a paleontologist shall be retained to monitor excavation activities that occur five feet below modern grade. If paleontological resources are found, earth-disturbing activities shall be diverted to a location away from the site of the find to a distance recommended by the paleontologist. For resources that are discovered, the paleontologist shall salvage, prepare, identify, and curate any paleontological resources deemed significant. The significant resources shall be sent to a City-approved depository along with a summary report. Construction activity shall resume at the site of the find upon recommendation and approval of the paleontologist.

The implementation of the above mitigation measure would reduce the project's impacts to unknown paleontological resources to less than significant.

Alternative 2

Less than significant impact with mitigation incorporated. The determination of less than significant impacts with the incorporation of mitigation measures for paleontological resources as described above under Alternative 1 would be the same for Alternative 2.

Mitigation Measure

Implementation of Mitigation Measure CR-2 is required.

The implementation of the above mitigation measure would reduce the project's impacts to unknown paleontological resources to less than significant.

Cumulative Impacts

Less than significant impact with mitigation incorporated. Cumulative development in Downtown Fresno may result in cumulative impacts on unknown paleontological resources during excavation activities. This potential cumulative impact is considered potentially significant. The implementation of Alternative 1 or 2 could also result in significant impacts to unknown paleontological resources, therefore, the contribution of Alternative 1 or 2 to potential cumulative impacts on unknown paleontological resources is considered cumulatively significant. Thus, Alternative 1 or 2 could result in a significant cumulative impact.

Mitigation Measure

Implementation of Mitigation Measure CR-2 is required.

The implementation of the above mitigation measure would reduce the project's contribution to potential cumulative impacts to unknown paleontological resources to less than cumulatively significant.

Human Remains

d) Disturb any human remains, including those interred outside of formal cemeteries?

Based on a records search, no known human remains are located on the project site. Because no deposits of human remains are known for the Project area, impacts to such resources are unexpected, and the potential for such impacts are considered low.

Project Impacts

Alternative 1

Less than significant with mitigation incorporated. Although there is a low potential for human remains to occur on the project site, there is still a possibility that buried human remains could be uncovered when excavation activities occur. Therefore, the excavation activities associated with Alternative 1 could result in potential significant impacts to unknown human remains.

Mitigation Measure

MM CR-3 If human remains are encountered, all ground-disturbing activities shall immediately be suspended within a 100-foot radius of the find, or a distance determined by a qualified professional archaeologist to be appropriate based on the potential for disturbance of additional remains. The Fresno County Coroner shall be contacted. If the remains are of Native American origin, the most likely descendants of the deceased must be identified by the Native American Heritage Commission (NAHC). The City of Fresno will consult with the Native American most likely descendant(s) to identify a mutually acceptable strategy for treating, with appropriate dignity, the human remains and any associated grave goods as provided in PRC Section 5097.98. If the NAHC is unable to identify a most likely descendant; if the descendant fails to make a recommendation within 24 hours of being notified by the NAHC or the City; and if the descendant is not capable of reaching a mutually acceptable strategy

through mediation by the NAHC, the Native American human remains and associated grave goods will be reburied with appropriate dignity on the proposed project site in a location not subject to further subsurface disturbance.

The implementation of the above mitigation measure would result in the immediate suspension of construction activities in the vicinity of the human remain and allow the process outlined in the Public Resources Code to be completed to reduce potential impacts to unknown human remains to less than significant.

Alternative 2

Less than significant impact with mitigation incorporated. The determination of less than significant impacts with the incorporation of mitigation measures for human remains as described above under Alternative 1 would be the same for Alternative 2.

Mitigation Measure

Implementation of Mitigation Measure CR-3 is required.

The implementation of the above mitigation measure would result in the immediate suspension of construction activities in the vicinity of the human remain and allow the process outlined in the Public Resources Code to be completed to reduce potential impacts to unknown human remains to less than significant.

Cumulative Impacts

Less than significant impact with mitigation incorporated. Cumulative development in Downtown Fresno may result in cumulative impacts on unknown human remains during excavation activities. This potential cumulative impact is considered potentially significant. The implementation of Alternative 1 or 2 could also result in significant impacts to unknown human remains, therefore, the contribution of Alternative 1 or 2 to potential cumulative impacts on unknown human remains is considered cumulatively significant. Thus, Alternative 1 or 2 could result in a significant cumulative impact.

Mitigation Measure

Implementation of Mitigation Measure CR-2 is required.

The implementation of the above mitigation measure would provide monitoring for excavation activities to reduce the project's contribution to potential cumulative impacts to unknown human remains to less than cumulatively significant.

3.6 - Geology and Soils

The following discussion is based on the Limited Geologic Hazards Summary that includes an assessment of the Fulton Mall area. The Report was prepared by Krazan & Associates for the Fulton Corridor Specific Plan Area and is provided in Appendix E of this Initial Study.

Earthquakes

a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury or death involving:

i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.

ii) Strong seismic ground shaking?

iii) Seismic-related ground failure, including liquefaction?

iv) Landslides?

The Fulton Mall is located along the east margin of the southern San Joaquin Valley portion of the Great Valley Geomorphic Province of California. The San Joaquin Valley is bordered to the north by the Sacramento Valley portion of the Great Valley, to the east by the Sierra Nevada, to the west by the Coast Ranges, and to the south by the Transverse Ranges. The San Joaquin sedimentary basin is separated from the Sacramento basin to the north by the buried Stockton arch and associated Stockton Fault. The 450-mile long Great Valley is an asymmetric structural trough that has been filled with a prism of Mesozoic and Cenozoic sediments up to 5 miles thick.

The Sierra Nevada, located east of the San Joaquin Valley, is gently southwesterly tilted fault block comprised of igneous and metamorphic rocks of pre-Tertiary age that comprise the basement beneath the San Joaquin Valley. The Coast Ranges, located west of the San Joaquin Valley, are comprised of folded and faulted sedimentary and metasedimentary rocks of Mesozoic and Cenozoic age.

The San Joaquin River and the Kings River are the principal rivers in the regional area. Alluvial fans formed by these rivers are the predominant geomorphic features in the Fresno area. The area of the Fulton Mall is characterized by low alluvial fans and plains, which constitute a belt of coalescing alluvial fans of low relief between the dissected uplands, adjacent to the Sierra Nevada and the valley trough. The Fulton Mall is located in the "Compound Alluvial Fan of Intermittent Streams North of the Kings River Geomorphic Area." Recent alluvial fan deposits from streams emerging from highlands surrounding the Great Valley and Pleistocene non-marine sedimentary deposits (Riverbank Formation) composed of older alluvium and dissected fan deposits underlie the vicinity of Fulton Mall.

The general area of the Fulton Mall is underlain by a homoclinal series of Cenozoic deposits dipping 4 to 6 degrees to the southwest toward the center of the San Joaquin Valley. The contact between the Cenozoic and basement rocks dips nearly 8 degrees southwest, or at a slightly greater inclination than does the on-lapping homoclinal Cenozoic sequence.

The Sierra Nevada and Coast Ranges are geologically young mountain ranges that possess active and potentially active fault zones. Major active faults and fault zones occur at some distance to the east, west, and south of Downtown Fresno. Numerous active faults are present within the central Coast Ranges west of Downtown Fresno including the San Andreas Fault (located approximately 65 miles west of Downtown Fresno). One of the nearest seismotectonic sources is the Great Valley Fault zone (Coast Ranges-Central Valley boundary zone), located approximately 39 miles west of Downtown Fresno. The Great Valley Fault zone is the geomorphic boundary of the Coast Ranges and the Central Valley and is underlain by a 300-mile long seismically active fold and thrust belt that has been the source of recent earthquakes, such as the 1983 magnitude 6.5 Coalinga and the 1985 magnitude 6.1 Kettleman Hills earthquakes. Nearly the entire thrust system is concealed or "blind." The basal detachment of this thrust system dips at a shallow angle to the west. East-directed thrusting over ramps in the detachment and west-directed thrusting on backthrusts are responsible for the uplift along the eastern range front of the Coast Ranges. Based on earthquake focal mechanisms, movement on the thrust zone is generally perpendicular to the strike of the geomorphic boundary and trend of the San Andreas Fault system. Shortening along the geomorphic boundary is driven by a component of the Pacific-North American Plate motion that is normal to the plate boundary. The Great Valley Fault zone is considered the dominant seismic feature with potential for affecting Downtown Fresno.

Regional structure within the Western Sierra Nevada north of Downtown Fresno is complex and generally consists of blocks separated by steeply eastward-dipping, north and northwest striking reverse faults of the Foothills Fault System. The Foothills Fault system is located approximately 37 miles north of Downtown Fresno. Based on mapping and historical seismicity, the seismicity of the Sierra Nevada foothills has been generally considered low by the scientific community. However, on August 1, 1975, a 5.7 Richter magnitude earthquake occurred near Oroville within the northern Sierra Nevada. Surface rupture along the Cleveland Hill Fault (part of the Foothills Fault System) was associated with 1975 Oroville earthquake. As a result of this event, numerous studies were undertaken to further evaluate the seismicity of the Sierra Nevada foothills. Of particular note are the geologic and seismicity studies conducted by Woodward-Clyde Consultants (WCC) to evaluate the proposed Auburn Dam site. Based on these studies, WCC concluded that seismic events in the Sierra Nevada foothills are associated with very small, geologically infrequent, incremental displacements having minor geomorphic surface expression.

In addition, the eastern border of the southern San Joaquin Valley is cut by a series of en-eschelon range-front faults. These faults are mainly northwest-trending normal faults, down dropped to the west and with a near vertical dip. One of the range-front faults, the Clovis Fault, is mapped approximately 13 miles northeast of Downtown Fresno. These range-front faults have generally been considered inactive; however, a September 1973 magnitude 4.4 earthquake that occurred approximately 4.3 miles north of Downtown Fresno may be related to this fault system.

The Sierra Nevada and Owens Valley Fault Zones bound the eastern edge of the Sierra Nevada block nearly 85 miles east of Downtown Fresno.

Tensional forces resulting in normal faults are reported to be related to crustal stress relief in the southeast portion of the San Joaquin Valley. Numerous relatively short, normal faults traverse this

region. Creep activity is the prominent mode of slip on those faults in this region that are active. These movements have continued on an intermittent basis from the early Miocene to Recent time. This faulting is directly related to and controls the accumulation of oil in several oil fields within the easterly portion of the valley. Most authors agree that current creep movements can be ascribed to subsidence promoted by extensive withdrawal of petroleum, and in some cases, groundwater. Those faults considered to be active in the southern valley are Kern Front and Pond Faults located at least 90 miles south of Downtown Fresno.

White Wolf Fault (responsible for a 1952 earthquake that caused extensive damage in the Bakersfield area) is located in the tectonically active Tehachapi Mountains at the southerly terminus of the valley, over 100 miles south of Downtown Fresno.

Project Impacts

Alternative 1

Rupture of a Known Earthquake Fault - **No impact.** According to the Limited Geologic Hazards Summary prepared for the vicinity of Fulton Mall, the project site does not lie on a Fault Rupture Hazard Zones Map. The nearest zoned fault is a portion of the Ortigalita Fault located approximately 58 miles west of Downtown Fresno. Therefore, Alternative 1 would result in no impacts related to rupture from a known earthquake fault.

Strong Seismic Ground Shaking - **Less than significant impact.** According to the Limited Geologic Hazards Summary prepared for the vicinity of Fulton Mall, the area encompassed within both planning areas has historically experienced a low-to-moderate degree of seismicity. The report reviewed historic earthquakes and concluded that no events exceeding magnitude 6.0 occurred within 40 miles of Downtown Fresno, representing the approximate threshold for potential damage related to seismically induced ground shaking. Moreover, the magnitude 6.7 event that occurred in May 1983 approximately 50 miles southwest of Downtown Fresno and did not result in any structural or architectural damage. Although the project site may be exposed to seismic ground shaking during an earthquake, the potential impacts to Alternative 1 are considered to be less than significant.

Seismic-Related Ground Failure and Liquefaction - **Less than significant impact.** According to the Limited Geologic Hazards Summary prepared for the vicinity of Fulton Mall, based on the nature of the subsurface materials and relatively level site conditions and low-to-moderate degree of seismicity, seismic induced settlement would result in a less than significant geologic hazard. Based on these findings, it appears that the potential for soil liquefaction within Fulton Mall is very low due to the type of soils anticipated to be within the upper layer, the relatively low levels of expected groundshaking at Fulton Mall, and the lack of high groundwater. Therefore, Alternative 1 would result in less than significant impacts associated with seismic-related ground failure and liquefaction.

Landslides - **No impact.** According to the Limited Geologic Hazards Summary prepared for the vicinity of Fulton Mall, the relatively level nature of the planning area would not result in the potential for landslides and no impacts on Alternative 1 would result.

Alternative 2

Rupture of a Known Earthquake Fault - **No impact.** The determination of no impact from a fault rupture during an earthquake as described under Alternative 1 would be the same for Alternative 2.

Strong Seismic Ground Shaking - **Less than significant impact.** The determination of less than significant impact from strong ground shaking during an earthquake as described under Alternative 1 would be the same for Alternative 2.

Seismic-Related Ground Failure and Liquefaction - **Less than significant impact.** The determination of less than significant impact from seismic-related ground failure and liquefaction during an earthquake as described under Alternative 1 would be the same for Alternative 2.

Landslides - **No impact.** The determination of no impact from landslides as described under Alternative 1 would be the same for Alternative 2.

Cumulative Impacts

No impact. Cumulative developments in Downtown Fresno will not result in altering geologic events or soil features/characteristics, such as ground shaking or seismic intensity. Therefore, the implementation of Alternative 1 or 2 will not affect the level of intensity at which a seismic event on an adjacent site is experienced. Alternative 1 or 2 would not contribute to potential significant cumulative impacts related to geology and soils, and therefore, Alternative 1 or 2 would result in no cumulative impacts.

Soil Erosion or Topsoil Loss

b) Result in substantial soil erosion or the loss of topsoil?

Project Impacts

Alternative 1

Less than significant impact. Reintroducing roadways would include grading and excavation necessary to accept the roadway improvements. Because Alternative 1 would be required to comply with the mandatory obligations under the National Pollution Discharge Elimination System (NPDES) by preparing a Storm Water Pollution Prevention Program (SWPPP) for construction activities, less than significant soil erosion or loss of topsoil impacts would result.

Alternative 2

Less than significant impact. The determination of no potential for substantial soil erosion or the loss of topsoil as described under Alternative 1 would be the same for Alternative 2.

Cumulative Impacts

No impact. As Alternative 1 or 2 would be required to comply with the mandatory obligations under the National Pollution Discharge Elimination System (NPDES) by preparing a Storm Water Pollution Prevention Program (SWPPP) for construction activities and that Downtown Fresno contains relatively flat terrain, potential cumulative soil erosion or loss of topsoil in the Downtown area would

be less than significant. Therefore, implementation of Alternative 1 or 2 would result in less than cumulative impacts associated with soil erosion or loss of topsoil.

Unstable Geologic Location

c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?

Project Impacts

Alternative 1

Less than significant impact. According to the Limited Geologic Hazards Summary prepared for the vicinity of Fulton Mall, Downtown Fresno is not subject to subsidence resulting from fluid or petroleum withdrawal. Also according to the Limited Geologic Hazards Summary, based on the nature of the subsurface materials and relatively level site conditions and low-to-moderate degree of seismicity, lateral spreading would not result in a significant geologic hazard. Refer to CEQA Checklist Question 3.6 a) above for a discussion related to liquefaction and landslides. Therefore, Alternative 1 would not be located on an unstable geologic unit or a geologic unit that would become unstable and less than significant impacts would result.

Alternative 2

Less than significant impact. The determination of less than significant impacts for unstable geologic conditions as described above under Alternative 1 would be the same for Alternative 2.

Cumulative Impacts

No impact. Since Downtown Fresno contains relatively flat terrain, cumulative developments in Downtown Fresno will not increase unstable geologic conditions for other sites. Therefore, cumulative development would not contribute any unstable geologic conditions to the Fulton Mall, and the implementation of Alternative 1 or 2 would not contribute to unstable geologic conditions to cumulative developments. Therefore, Alternative 1 or 2 would result in no cumulative unstable geologic impacts.

Expansive Soil

d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?

Project Impacts

Alternative 1

Less than significant impact. According to the Limited Geologic Hazards Summary prepared for the vicinity of Fulton Mall, the surface and near-surface soils observed consist of sandy silts, silty sands, sandy silt or silty sand with trace clay, and sands. These materials are considered to have a very low to moderate expansion potential. Therefore, impacts related to expansive soils would be less than significant.

Alternative 2

Less than significant impact. The determination of less than significant impacts associated with expansive soils as described under Alternative 1 would be the same for Alternative 2..

Cumulative Impacts

No impact. Cumulative developments in Downtown Fresno will not increase expansive soil impacts on other sites. Therefore, cumulative development would not contribute any expansive soil impacts to the Fulton Mall, and the implementation of Alternative 1 or 2 would not contribute to expansive soil impacts to cumulative developments. Therefore, Alternative 1 or 2 would result in no cumulative impacts associated with expansive soils.

Wastewater Disposal Systems

e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?

Project Impacts

Alternative 1

No impact. Alternative 1 does not propose alternative wastewater disposal systems or septic tank wastewater disposal systems. Therefore, no impacts related to soils incapable of supporting wastewater systems would result from Alternative 1 implementation.

Alternative 2

No impact. The determination of no impact from soils incapable of adequately supporting wastewater disposal systems as described above under alternative 1 would be the same for Alternative 2.

Cumulative Impacts

No impact. Since the development of Alternative 1 or 2 does not involve alternative wastewater disposal systems or septic tank wastewater disposal systems, Alternative 1 or 2 would result in no cumulative impact to these systems.

3.7 - Greenhouse Gas Emissions

The following is from the Air Quality Report that was prepared for the Fulton Mall Reconstruction project by FCS in September 2013. The Report is provided in Appendix B of this Initial Study. Climate change refers to long-term changes in temperature, precipitation, wind patterns, and other elements of the earth's climate system. An ever-increasing body of scientific research attributes these climatological changes to greenhouse gases, particularly those generated from the production and use of fossil fuels.

While climate change has been a concern for several decades, the establishment of the Intergovernmental Panel on Climate Change (IPCC) by the United Nations and World Meteorological Organization's in 1988, has led to increased efforts devoted to greenhouse gas emissions reduction and climate change research and policy. These efforts are primarily concerned with the emissions of

greenhouse gases related to human activity that include carbon dioxide (CO_2), methane, nitrous oxide, tetrafluoromethane, hexafluoroethane, sulfur hexafluoride, HFC-23 (fluoroform), HFC-134a (s, s, s, 2 -tetrafluoroethane), and HFC-152a (difluoroethane).

Transportation sources (passenger cars, light duty trucks, other trucks, buses and motorcycles) in the state of California make up the largest source (second to electricity generation) of greenhouse gas emitting sources. Conversely, the main source of greenhouse gas emissions in the United States (U.S.) is electricity generation followed by transportation. The dominant greenhouse gas emitted is CO_2, mostly from fossil fuel combustion.

There are four primary strategies for reducing greenhouse gas emissions from transportation sources: 1) improve system and operation efficiencies, 2) reduce growth of vehicle miles traveled (VMT) 3) transition to lower greenhouse gas fuels and 4) improve vehicle technologies. To be most effective all four should be pursued collectively. The following regulatory setting section outlines state and federal efforts to comprehensively reduce greenhouse gas emissions from transportation sources.

Potential Environmental Effects

Worldwide, average temperatures are likely to increase by 1.8 degrees Celsius (°C) to 4°C, or approximately 3 °F to 7°F by the end of the 21st century (IPCC 2007). However, a global temperature increase does not translate to a uniform increase in temperature in all locations on the earth. Regional climate changes are dependent on multiple variables, such as topography. One region of the Earth may experience increased temperature, increased incidents of drought and similar warming effects, whereas another region may experience a relative cooling. According to the Intergovernmental Panel on Climate Change's Working Group II Report, climate change impacts to North America may include diminishing snowpack, increasing evaporation, exacerbated shoreline erosion, exacerbated inundation from sea level rising, increased risk and frequency of wildfire, increased risk of insect outbreaks, increased experiences of heat waves, and rearrangement of ecosystems, as species and ecosystem zones shift northward and to higher elevations (IPCC 2007).

For California, climate change has the potential to incur/exacerbate the following environmental impacts (CAT 2006):

- Reduced precipitation;
- Changes to precipitation and runoff patterns;
- Reduced snowfall (precipitation occurring as rain instead of snow);
- Earlier snowmelt;
- Decreased snowpack;
- Increased agricultural demand for water;
- Intrusion of seawater into coastal aquifers;
- Increased agricultural growing season;
- Increased growth rates of weeds, insect pests and pathogens;
- Inundation of low-lying coastal areas by sea level rise;
- Increased incidents and severity of wildfire events; and,
- Expansion of the range and increased frequency of pest outbreaks.

Although certain environmental effects are widely accepted to be a potential hazard to certain locations, such as rising sea level for low-laying coastal areas, it is currently infeasible to predict all environmental effects of climate change on any one location.

Federal Regulatory Setting

Although climate change and greenhouse gas reduction is a concern at the federal level; currently there are no regulations or legislation that have been enacted specifically addressing greenhouse gas emissions reductions and climate change at the project level for transportation projects. Neither the United States Environmental Protection Agency (EPA) nor Federal Highway Administration (FHWA) has promulgated explicit guidance or methodology to conduct project-level greenhouse gas analysis. As stated on FHWA's climate change website (http://www.fhwa.dot.gov/hep/climate/index.htm), climate change considerations should be integrated throughout the transportation decision-making process—from planning through project development and delivery. Addressing climate change mitigation and adaptation up front in the planning process will facilitate decision-making and improve efficiency at the program level, and will inform the analysis and stewardship needs of project level decision-making. Climate change considerations can easily be integrated into many planning factors, such as supporting economic vitality and global efficiency, increasing safety and mobility, enhancing the environment, promoting energy conservation, and improving the quality of life.

The four strategies set forth by FHWA to lessen climate change impacts do correlate with efforts that the State has undertaken and is undertaking to deal with transportation and climate change; the strategies include improved transportation system efficiency, cleaner fuels, cleaner vehicles, and reduction in the growth of vehicle hours traveled.

Climate change and its associated effects are also being addressed through various efforts at the federal level to improve fuel economy and energy efficiency, such as the "National Clean Car Program" and Executive Order 13514- Federal Leadership in Environmental, Energy and Economic Performance.

Executive Order 13514 is focused on reducing greenhouse gases internally in federal agency missions, programs and operations, but also direct federal agencies to participate in the interagency Climate Change Adaptation Task Force, which is engaged in developing a U.S. strategy for adaptation to climate change.

On April 2, 2007, in Massachusetts v. EPA, 549 U.S. 497 (2007), the Supreme Court found that greenhouse gases are air pollutants covered by the Clean Air Act and that the EPA has the authority to regulate greenhouse gases. The Court held that the EPA Administrator must determine whether or not emissions of greenhouse gases from new motor vehicles cause or contribute to air pollution, which may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision.

On December 7, 2009, the EPA Administrator signed two distinct findings regarding greenhouse gases under section 202(a) of the Clean Air Act:

- Endangerment Finding: The Administrator found that the current and projected concentrations of the six key well-mixed greenhouse gases—carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6)—in the atmosphere threaten the public health and welfare of current and future generations.
- Cause or Contribute Finding: The Administrator found that the combined emissions of these well-mixed greenhouse gases from new motor vehicles and new motor vehicle engines contribute to the greenhouse gas pollution, which threatens public health and welfare.

Although these findings did not themselves impose any requirements on industry or other entities, this action was a prerequisite to finalizing the EPA's Proposed Greenhouse Gas Emission Standards for Light-Duty Vehicles, which was published on September 15, 2009. On May 7, 2010 the final Light-Duty Vehicle Greenhouse Gas Emissions Standards and Corporate Average Fuel Economy Standards was published in the Federal Register.

EPA and the National Highway Traffic Safety Administration (NHTSA) are taking coordinated steps to enable the production of a new generation of clean vehicles with reduced greenhouse gas emissions and improved fuel efficiency from on-road vehicles and engines. These next steps include developing the first-ever greenhouse gas regulations for heavy-duty engines and vehicles, as well as additional light-duty vehicle greenhouse gas regulations. These steps were outlined by President Obama in a memorandum on May 21, 2010.

The final combined EPA and NHTSA standards that make up the first phase of this national program apply to passenger cars, light-duty trucks, and medium-duty passenger vehicles, covering model years 2012 through 2016. The standards require these vehicles to meet an estimated combined average emissions level of 250 grams of carbon dioxide per mile, equivalent to 35.5 miles per gallon if the automobile industry were to meet this carbon dioxide level solely through fuel economy improvements. Together, these standards will cut greenhouse gas emissions by an estimated 960 million metric tons and 1.8 billion barrels of oil over the lifetime of the vehicles sold under the program (model years 2012-2016).

On January 24, 2011, the EPA along with the U.S. Department of Transportation and the State of California announced a single timeframe for proposing fuel economy and greenhouse gas standards for model years 2017-2025 cars and light-trucks. Proposing the new standards in the same timeframe (September 1, 2011) signals continued collaboration that could lead to an extension of the current National Clean Car Program.

Council on Environmental Quality. On February 18, 2010, the Council on Environmental Quality (CEQ) provided a draft guidance memorandum for public consideration and comment on the ways in which federal agencies can improve their consideration of the effects of greenhouse gas emissions and climate change in evaluations of proposals for federal actions under NEPA (CEQ 2010).

CEQ proposes to advise federal agencies to consider, in scoping their NEPA analyses, whether analysis of the direct and indirect greenhouse gas emissions from their proposed actions may

provide meaningful information to decision makers and the public. Specifically, if a proposed action would be reasonably anticipated to cause direct emissions of 25,000 metric tons or more of carbon dioxide equivalent greenhouse gas emissions on an annual basis, agencies should consider this an indicator that a quantitative and qualitative assessment may be meaningful to decision makers and the public. For long-term actions that have annual direct emissions of less than 25,000 metric tons of carbon dioxide equivalent, CEQ encourages federal agencies to consider whether the action's long-term emissions should receive similar analysis. CEQ does not propose this as an indicator of a threshold of significant effects, but rather as an indicator of a minimum level of greenhouse gas emissions that may warrant some description in the appropriate NEPA analysis for agency actions involving direct emissions of greenhouse gases.

State

There have been significant legislative and regulatory activities that affect climate change and greenhouse gases in California. Legislative and regulatory activities pertinent to transportation are discussed below.

Assembly Bill 1493 (AB 1493), Pavley. Vehicular Emissions: Greenhouse Gases (AB 1493), 2002: requires the ARB to develop and implement regulations to reduce automobile and light truck greenhouse gas emissions. These stricter emissions standards were designed to apply to automobiles and light trucks beginning with the 2009-model year. In June 2009, the EPA Administrator granted a Clean Air Act waiver of preemption to California. This waiver allowed California to implement its own greenhouse gas emission standards for motor vehicles beginning with model year 2009. California agencies will be working with Federal agencies to conduct joint rulemaking to reduce greenhouse gas emissions for passenger cars model years 2017-2025.

Executive Order S-3-05: (signed on June 1, 2005, by Governor Arnold Schwarzenegger) the goal of this Executive Order is to reduce California's greenhouse gas emissions to: 1) 2000 levels by 2010, 2) 1990 levels by the 2020 and 3) 80 percent below the 1990 levels by the year 2050. In 2006, this goal was further reinforced with the passage of Assembly Bill 32.

AB32 (AB 32), the Global Warming Solutions Act of 2006: AB 32 sets the same overall greenhouse gas emissions reduction goals as outlined in Executive Order S-3-05, while further mandating that ARB create a plan, which includes market mechanisms, and implement rules to achieve "real, quantifiable, cost-effective reductions of greenhouse gases." Executive Order S-20-06 further directs state agencies to begin implementing AB 32, including the recommendations made by the State's Climate Action Team.

Executive Order S-01-07: Governor Schwarzenegger set forth the low carbon fuel standard for California. Under this Executive Order, the carbon intensity of California's transportation fuels is to be reduced by at least ten percent by 2020.

Senate Bill 97 (Chapter 185, 2007): required the Governor's Office of Planning and Research (OPR) to develop recommended amendments to the State CEQA Guidelines for addressing greenhouse gas emissions. The Amendments became effective on March 18, 2010.

Senate Bill 375: SB 375 states, "Without improved land use and transportation policy, California will not be able to achieve the goals of AB 32." SB 375 contains the following:

- Requires MPOs to include sustainable community strategies in their regional transportation plans for reducing greenhouse gas emissions,
- Aligns planning for transportation and housing, and
- Creates specified incentives for the implementation of the strategies. Concerning CEQA, SB 375, section 21159.28 states that CEQA findings determinations for certain projects are not required to reference, describe, or discuss growth inducing impacts or any project-specific or cumulative impacts from cars and light-duty truck trips generated by a project on global warming or the regional transportation network if the project:
  - Is in an area with an approved sustainable communities strategy or an alternative planning strategy that the ARB accepts as achieving the greenhouse gas emission reduction targets;
  - Is consistent with that strategy (in designation, density, building intensity, and applicable policies); and
  - Incorporates the mitigation measures required by an applicable prior environmental document.

Caltrans

Caltrans continues to be actively involved on the Governor's Climate Action Team as ARB works to implement the Executive Orders S-3-05 and S-01-07 and help achieve the targets set forth in AB 32. Many of the strategies Caltrans is using to help meet the targets in AB 32 come from the California Strategic Growth Plan, which is updated each year. Former Governor Arnold Schwarzenegger's Strategic Growth Plan calls for a $222 billion infrastructure improvement program to fortify the state's transportation system, education, housing, and waterways, including $100.7 billion in transportation funding during the next decade. The Strategic Growth Plan targets a significant decrease in traffic congestion below today's level and a corresponding reduction in greenhouse gas emissions. The Strategic Growth Plan proposes to do this while accommodating growth in population and the economy. A suite of investment options has been created that combined together are expected to reduce congestion. The Strategic Growth Plan relies on a complete systems approach to attain CO_2 reduction goals: system monitoring and evaluation, maintenance and preservation, smart land use and demand management, and operational improvements.

Caltrans is supporting efforts to reduce vehicle miles traveled by planning and implementing smart land use strategies: job/housing proximity, developing transit-oriented communities, and high-density housing along transit corridors. Caltrans is working closely with local jurisdictions on planning activities; however, Caltrans does not have local land use planning authority. Caltrans is also supporting efforts to improve the energy efficiency of the transportation sector by increasing vehicle fuel economy in new cars, light and heavy-duty trucks; Caltrans is doing this by supporting on-going research efforts at universities, by supporting legislative efforts to increase fuel economy, and by its participation on the Climate Action Team. It is important to note, however, that the control of the fuel economy standards is held by EPA and ARB. Lastly, the use of alternative fuels is

also being considered; Caltrans is participating in funding for alternative fuel research at the UC Davis.

Local Agencies

San Joaquin Valley Air Pollution Control District

On December 17, 2009, the SJVAPCD Governing Board adopted "Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA" and the policy: "District Policy - Addressing GHG Emission Impacts for Stationary Source Projects Under CEQA When Serving as the Lead Agency." The SJVAPCD concluded that the existing science is inadequate to support quantification of the impacts that project-specific greenhouse gas emissions have on global climatic change. The SJVAPCD found that the effects of project-specific emissions to be cumulative, and without mitigation, their incremental contribution to global climatic change could be considered cumulatively considerable. The SJVAPCD found that this cumulative impact is best addressed by requiring all projects to reduce their greenhouse gas emissions, whether through project design elements or mitigation.

The SJVAPCD's approach is intended to streamline the process of determining if project-specific greenhouse gas emissions would have a significant effect. Projects exempt from the requirements of CEQA, and projects complying with an approved plan or mitigation program would be determined to have a less than significant cumulative impact. Such plans or programs must be specified in law or adopted by the public agency with jurisdiction over the affected resources and have a certified Final CEQA document.

For non-exempt projects, those projects for which there is no applicable approved plan or program, or those projects not complying with an approved plan or program, the lead agency would evaluate the project against a performance-based standards and would require the adoption of design elements, known as a Best Performance Standard, to reduce greenhouse gas emissions. The Best Performance Standards have not yet fully been established, though they must be designed to effect a 29-percent reduction when compared with the "business-as-usual" projections identified in ARB's AB 32 Scoping Plan.

"Business-as-usual" is the emissions occurring in 2020 if the average baseline emissions during the 2002-2004 period were grown to 2020 levels, without control. These standards thus would carry with them pre-quantified emissions reductions, eliminating the need for project specific quantification. Therefore, projects incorporating Best Performance Standards would not require specific quantification of greenhouse gas emissions, and automatically would be determined to have a less than significant cumulative impact for greenhouse gas emissions.

For stationary source permitting projects, Best Performance Standards means, "The most stringent of the identified alternatives for control of greenhouse gas emissions, including type of equipment, design of equipment and operational and maintenance practices, which are achieved-in-practice for the identified service, operation, or emissions unit class." The SJVAPCD has identified Best Performance Standards for the following sources: boilers; dryers and dehydrators; oil and gas

extraction, storage, transportation, and refining operations; cogeneration; gasoline dispensing facilities; volatile organic compound control technology; and steam generators.

For development projects, Best Performance Standards means, "Any combination of identified greenhouse gas emission reduction measures, including project design elements and land use decisions that reduce project specific greenhouse gas emission reductions by at least 29 percent compared with business as usual."

Projects not incorporating Best Performance Standards would require quantification of greenhouse gas emissions and demonstration that business-as-usual greenhouse gas emissions have been reduced or mitigated by 29 percent. Quantification of greenhouse gas emissions would be required for all projects for which the lead agency has determined that an environmental impact report is required, regardless of whether the project incorporates Best Performance Standards.

Fresno Council of Governments

Fresno COG is currently working on the 2014 Regional Transportation Plan Sustainable Communities Strategy (SCS), which addresses greenhouse gas emissions reductions and other air emissions. SCS regional plans consider long-term housing, transportation, and land use needs, and are being coordinated by the 8 San Joaquin Valley Air Basin MPOs.

City of Fresno

The City is working with a consultant to prepare a Climate Action Plan for municipal and community-wide sources. Although the City has made progress in the preparation of the Climate Action Plan, a draft plan has not been released as of the date of this document.

Pollutants of Concern

Gases that trap heat in the atmosphere are greenhouse gases, analogous to the way a greenhouse retains heat. The accumulation of greenhouse gases in the atmosphere regulates the earth's temperature. However, human activities have increased the amount of greenhouse gases in the atmosphere. Some greenhouse gases can remain in the atmosphere for hundreds of years. The following greenhouse gases are defined under Assembly Bill 32 but are not expected to be generated by the Project: chlorofluorocarbons, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride.

Individual greenhouse gas compounds have varying global warming potential and atmospheric lifetimes. The global warming potential of a greenhouse gas is a measure of how much a given mass of a greenhouse gas is estimated to contribute to global warming. To describe how much global warming a given type and amount of greenhouse gas may cause, use is made of a metric called the carbon dioxide equivalent.

The calculation of the carbon dioxide equivalent is a consistent methodology for comparing greenhouse gas emissions since it normalizes various greenhouse gas emissions to a consistent reference gas, carbon dioxide. Carbon dioxide, the reference gas for global warming potential, has a global warming potential of one. For example, methane's warming potential of 21 indicates that methane has a 21 times greater warming affect than carbon dioxide on a molecule per molecule

basis. A carbon dioxide equivalent is the mass emissions of an individual greenhouse gas multiplied by its global warming potential. The following is a brief description of the most common greenhouse gases that may be emitted by the Fulton Mall Reconstruction Project.

Carbon dioxide. Carbon dioxide (CO_2) is an odorless, colorless natural greenhouse gas. CO_2 is emitted from natural and anthropogenic sources. Natural sources include the following: decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungus; evaporation from oceans; and volcanic outgassing. Anthropogenic sources are from burning coal, oil, natural gas, gasoline, and wood. As discussed above, CO_2 has a global warming potential of 1.

Methane. Methane is a flammable greenhouse gas. A natural source of methane is from the anaerobic decay of organic matter. Geological deposits, known as natural gas fields, also contain methane, which is extracted for fuel. Other sources are from landfills, fermentation of manure, and ruminants such as cattle. Methane has a global warming potential of 21.

Nitrous oxide. Nitrous oxide, also known as laughing gas, is a colorless greenhouse gas. Nitrous oxide is produced by microbial processes in soil and water, including those reactions that occur in fertilizer containing nitrogen. In addition to agricultural sources, some industrial processes (fossil fuel-fired power plants, nylon production, nitric acid production, and vehicle emissions) also contribute to its atmospheric load. Nitrous oxide is a highly potent greenhouse gas with a global warming potential of 310.

Greenhouse Gas Emissions

a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

Project Impacts

Alternative 1

Less than significant impact. An individual project does not generate enough greenhouse gas emissions to significantly influence global climate change. Rather, global climate change is a cumulative impact. This means that a project may participate in a potential impact through its incremental contribution combined with the contributions of all other sources of greenhouse gases. In assessing cumulative impacts, it must be determined if a project's incremental effect is "cumulatively considerable." See CEQA Guidelines sections 15064(h)(1) and 15130. To make this determination the incremental impacts of the project must be compared with the effects of past, current, and probable future projects. To gather sufficient information on a global scale of all past, current, and future projects in order to make this determination is a difficult if not impossible task.

The AB 32 Scoping Plan contains the main strategies California will use to reduce greenhouse gases. As part of its supporting documentation for the Draft Scoping Plan, ARB released the greenhouse gas inventory for California (Forecast last updated: 28 October 2010). The forecast is an estimate of the emissions expected to occur in the year 2020 if none of the foreseeable measures included in the Scoping Plan were implemented. The base year used for forecasting emissions is the average of statewide emissions in the greenhouse gas inventory for 2006, 2007, and 2008.

Caltrans and its parent agency, the Business, Transportation, and Housing Agency, have taken an active role in addressing greenhouse gas emission reduction and climate change. Recognizing that 98 percent of California's greenhouse gas emissions are from the burning of fossil fuels and 40 percent of all human made greenhouse gas emissions are from transportation, Caltrans has created and is implementing the Climate Action Program at Caltrans that was published in December 2006 (see Climate Action Program at Caltrans (December 2006).

Generate Greenhouse Gas Emissions
Greenhouse gas emissions for transportation projects can be divided into those produced during construction and those produced during operations. Construction greenhouse gas emissions include emissions produced as a result of material processing, emissions produced by onsite construction equipment, and emissions arising from traffic delays due to construction. These emissions will be produced at different levels throughout the construction phase; their frequency and occurrence can be reduced through innovations in plans and specifications and by implementing better traffic management during construction phases.

Construction

Alternative 1 would emit greenhouse gases from upstream emission sources and direct sources (combustion of fuels from worker vehicles and construction equipment). An upstream emission source (also known as life cycle emissions) refers to emissions that were generated during the manufacture of products to be used for construction of the Project. Upstream emission sources for Alternative 1 include but are not limited to the following: emissions from the manufacture of steel and/or emissions from the transportation of construction materials in other countries. The upstream emissions were not estimated because they are not within the control of Alternative 1 and to do so would be speculative at this time. Additionally, the California Air Pollution Control Officers Association (CAPCOA) White Paper on CEQA & Climate Change supports this conclusion by stating, "The full life-cycle of GHG [greenhouse gas] emissions from construction activities is not accounted for … and the information needed to characterize [life-cycle emissions] would be speculative at the CEQA analysis level" (CAPCOA 2008). Therefore, pursuant to CEQA Guidelines Section 15144 and 15145, upstream/life cycle, emissions are speculative and no further discussion is necessary.

The emissions of CO_2 from Alternative 1 construction equipment and worker vehicles were calculated using the Road Construction Emissions Model, Version 7, and the CalEEMod emissions model. As described in Appendix B of this Initial Study, Alternative 1 would result in approximately 910.62 metric tons of CO_2 ($MTCO_2e$) in 2014. Alternative 1 would also emit methane and nitrous oxide from construction equipment; however, emissions of methane and nitrous oxide are negligible compared to CO_2 emissions.

Construction emissions would be short term in nature and would occur before the year 2020. AB 32 requires that annual emissions in the State of California be reduced to 1990 levels by the year 2020. Although some greenhouse gases can remain in the atmosphere for long periods, AB 32 does not regulate concentrations.

Operation

Greenhouse gas emissions were estimated using the web-based data access EMFAC2011 as described in Appendix B of this Initial Study. The proposed Fulton Street between Tuolumne Street and Inyo Street would result in 210 average annual daily trips (AADT) under baseline plus project condition and 2,310 AADT under cumulative with project condition. As discussed in Appendix J1 of this Initial Study (traffic study), the project does not propose any additional traffic generating land uses and would only redistribute trips. Therefore, development under Alternative 1 would not result in any additional vehicle miles traveled compared to the no project scenario.

Since Alternative 1 would not result in any additional vehicle miles traveled, emissions estimates discussed in Appendix B of this Initial Study are the same for all alternatives. However, Alternative 1 is expected to improve the LOS at intersections within the vicinity of Fulton Mall. Alternative 1 would create additional travel pathways through the project area, and provide more direct routes through the project area, thereby improving mobility and potentially reducing regional VMT. Improvement in traffic flow would reduce criteria pollutants and greenhouse gas emissions because emissions on a grams-per-mile basis decrease while the speed increases, with a peak efficiency at about 45 to 50 miles per hour. Therefore, emissions of greenhouse gases would be lower with the Alternative 1 and higher with the no project alternative.

One of the main strategies in Caltrans's Climate Action Program to reduce greenhouse gas emissions is to make California's transportation system more efficient. The highest levels of carbon dioxide from mobile sources, such as automobiles, occur at stop-and-go speeds (0-25 miles per hour) and speeds over 55 mph; the most severe emissions occur from 0-25 miles per hour. To the extent that a project relieves congestion by enhancing operations and improving travel times in high congestion travel corridors greenhouse gas emissions, particularly CO_2, may be reduced.

In summary, the implementation of Alternative 1 is considered to result in a less than significant impact on greenhouse gas emissions from construction and operation activities..

Alternative 2

Less than significant impact. The determination of less than significant impacts on greenhouse gases as described above under Alternative 1 would be the same as described for Alternative 2. The specific amount of construction-related greenhouse gas emissions is slightly lower (909.53 $MTCO_2e$ in 2014) for Alternative 2 compared to Alternative 1.

Cumulative Impacts

Less than significant impact. Cumulative development in Downtown Fresno will result in the generation of greenhouse gases during construction and operational activities. Implementation of Alternative 1 or 2 would result in the generation of greenhouse gas emissions during construction, but is expected to reduce greenhouse gases during operation of the project by relieving congestion through enhanced operations and improving travel times. The contribution of greenhouse gases during construction activities under Alternative 1 or 2 would contribute to cumulative greenhouse gas emissions; however, this contribution would be less than cumulatively considerable because the emissions would not be ongoing and would occur over a short duration. Therefore, Alternative 1 or 2 would result in less than significant cumulative impacts on greenhouse gases.

Conflict with Plan, Policy, or Regulation that Reduces Emissions

b) Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?

Project Impacts

Alternative 1

No impact. As described above in CEQA Checklist Question 3.7 a), Alternative 1 would likely reduce the future-year greenhouse gas emissions generated by trips through the project area. Therefore, Alternative 1 would also lower fuel consumption associated with travel in the area. Implementation of Alternative 1 would not conflict with any applicable greenhouse gas plan, and therefore, Alternative 1 would result in no impact on an applicable plan.

Alternative 2

No impact. The determination of no impact on an applicable greenhouse gas plan as described above for Alternative 1 would be the same for Alternative 2.

Cumulative Impacts

No impact. Since Alternative 1 or 2 would not conflict with an applicable greenhouse gas plan, neither Alternative 1 or 2 would contribute to cumulative impacts on an applicable plan. Therefore, Alternative 1 or 2 would result in no cumulative impacts on an applicable greenhouse gas plan.

3.8 - Hazards and Hazardous Materials

The following discussion is based on hazardous materials information that was prepared for the proposed project. A Supplemental Assessment to Fulton Corridor Phase I Environmental Site Assessment was prepared by Caltrans, District 6 in June 2013. This Assessment is located in Appendix F1 in this Initial Study. Additional Hazardous Materials Information was also gathered for the project and is located in Appendix F2 of this Initial Study.

Routine Use

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Project Impacts

Alternative 1

Less than significant impact. The construction of the proposed enhanced roadways with sidewalks would not result in the routine use, storage, transport, or disposal of large quantities of hazardous substances. The proposed project could involve the use of some hazardous and flammable substances that would be used during the construction phase. These substances could include vehicle fuels and oils in the operation of heavy equipment for site grading and roadway construction. Construction vehicles onsite may require routine or emergency maintenance that could result in the release of oil, diesel fuel, transmission fluid, or other materials. However, the materials used would

not be in quantities or stored in a manner that pose a significant hazard to the public. Therefore, the impacts resulting from project construction would be less than significant.

During long-tem activities given that the proposed new streets under Alternative 1 will provide access to the existing uses within Fulton Mall, no routine transport, use, or disposal of hazardous materials would foreseeably occur. Therefore, long-term impacts would be less than significant.

Alternative 2

Less than significant impact. The determination of no potential to create a significant hazard to the public from the routine transport, use or disposal of hazardous materials as described under Alternative 1 would be the same for Alternative 2.

Cumulative Impacts

Less than significant impact. The cumulative context for the analysis of potential hazardous materials impacts related to the routine transport, use, or disposal of hazardous materials is generally site-specific, rather than cumulative in nature. Compliance with all applicable federal, state, and local regulations related to hazards and hazardous materials would be required for the project. Additionally, the project would not include the routine transport, use or disposal of hazardous materials. Therefore, project impacts from hazardous materials would not be cumulatively considerable resulting in a less than significant cumulative impact.

Accident Conditions

b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

It is not anticipated that the Fulton Mall Project could create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. The environmental project analysis is discussed below.

Potential impacts may occur if unanticipated contamination is discovered during project construction. If contamination is detected, then a site-specific investigation by a hazardous materials environmental professional would be required.

Project Impacts

Alternative 1

Less than significant with mitigation. Alternative 1 could involve the use of some hazardous and flammable substances during the construction phase. These substances could include vehicle fuels and oils in the operation of heavy equipment for site grading and roadway construction. Construction vehicles onsite may require routine or emergency maintenance that could result in the release of oil, diesel fuel, transmission fluid, or other materials. However, the materials used would not be in quantities or stored in a manner that pose a significant hazard to the public. Because project construction would comply with applicable federal, state, and local laws pertaining to the safe handling and transport of hazardous materials impacts associated with accidental release of

hazardous materials from construction equipment/vehicles or operational activities would be less than significant.

Potential impacts may occur if unanticipated hazardous materials contamination is discovered during project construction. Impacts would be reduced to less than significant with the implementation of Mitigation Measures HAZ-1 and HAZ-2.

Mitigation Measures

MM HAZ-1 In the event that unknown soil contamination is discovered during grading activities, the property owners and/or developers of properties shall ensure that site characterization shall be conducted in the form of step-wise Phase II ESA in order to characterize the source and maximum extent of impacts from constituents of concern. The findings and conclusions of the site characterization shall become the basis for formation of a remedial action plan and/or risk assessment.

MM HAZ-2 If the findings and conclusions of the Phase II ESA, site characterization and/or risk assessment demonstrate the presence of concentrations of hazardous materials exceeding regulatory threshold levels, property owners and/or developers of properties shall complete site remediation and potential risk assessment with oversight from the applicable regulatory agency including but not limited to, the Cal-EPA DTSC or RWQCB, and Fresno County Department of Environmental Health Services. Potential remediation could include the removal or treatment of water and/or soil. If removal occurs, hazardous materials shall be transported and disposed at a hazardous materials permitted facility.

The implementation of the above measures would provide a process to reduce the potential hazardous materials impacts from accident conditions to be less than significant.

Alternative 2

Less than significant impact with mitigation measures incorporated. The determination of potential impacts to people from the release of hazardous materials into the environment as described under Alternative 1 would be the same for Alternative 2.

Mitigation Measures

MM HAZ-1 In the event that unknown soil contamination is discovered during grading activities, the property owners and/or developers of properties shall ensure that site characterization shall be conducted in the form of step-wise Phase II ESA in order to characterize the source and maximum extent of impacts from constituents of concern. The findings and conclusions of the site characterization shall become the basis for formation of a remedial action plan and/or risk assessment.

MM HAZ-2 If the findings and conclusions of the Phase II ESA, site characterization and/or risk assessment demonstrate the presence of concentrations of hazardous materials exceeding regulatory threshold levels, property owners and/or developers of properties shall complete site remediation and potential risk assessment with

oversight from the applicable regulatory agency including but not limited to, the Cal-EPA DTSC or RWQCB, and Fresno County Department of Environmental Health Services. Potential remediation could include the removal or treatment of water and/or soil. If removal occurs, hazardous materials shall be transported and disposed at a hazardous materials permitted facility.

The implementation of the above measures would provide a process to reduce the potential hazardous materials impacts from accident conditions to be less than significant.

Cumulative Impacts

Less than significant Impact with mitigation measures incorporated. Alternatives 1 or 2 would not result in reasonably foreseeable upset or accident conditions involving the release of hazardous materials into the environment from the use, storage or transport of hazardous materials. Potential impacts may occur if unanticipated hazardous materials contamination is discovered during project construction. Therefore, there is a potential for Alternative 1 or 2 to contribute to potential significant hazardous materials impacts. Therefore, these potential impact are considered potentially significant.

Mitigation Measures

Implementation of Mitigation Measures HAZ-1 and HAZ-2 is required.

The implementation of the above measures would provide a process to reduce the potential hazardous materials impacts from accident conditions to be less than significant. Therefore, the implementation of the above measures would reduce the contribution of Alternative 1 or 2 to cumulative hazardous materials impacts from accidental conditions to less than cumulatively significant. Therefore, cumulative impacts would be less than significant.

Schools

c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

The Fulton Mall consists of six blocks bounded by Van Ness Avenue to the east, Inyo Street to the south, Broadway Street to the west, and Tuolumne Street to the north. The nearest schools to the project area are the Fresno Academy for Civic and Entrepreneurial Leadership (Fresno Unified School District charter school) located approximately 0.20 mile southwest of the project site and the Fresno County Special Education Local Plan School (public) located approximately 0.07 mile northeast of the project site.

Project Impacts

Alternative 1

Less than significant impact. Alternative 1 could involve the use of some hazardous and flammable substances that would be used during the construction phase. These substances could include vehicle fuels and oils in the operation of heavy equipment for site grading and roadway construction.

Construction vehicles onsite may require routine or emergency maintenance that could result in the release of oil, diesel fuel, transmission fluid, or other materials. However, the materials used would not be in quantities or stored in a manner that pose a significant hazard to the public, additionally, the construction would be subject to applicable federal, state, and local laws pertaining to the safe handling and transport of hazardous materials impacts. Therefore, Alternative 1 would result in a less than significant hazards impacts on schools.

Alternative 2

Less than significant impact. The determination of less than significant impact on schools from the use of hazardous materials as described for Alternative 1 would be the same for Alternative 2.

Cumulative Impacts.

Less than significant impact. The proposed construction activities as well as construction activities from cumulative projects are required to comply with laws pertaining to safe handling of hazardous materials. With compliance, cumulative impacts would be less than significant, and therefore, the project would result in a less than significant cumulative impact.

Hazardous Materials Site Listing

d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

The Fulton Mall is located within the boundaries of the draft Fulton Corridor Specific Plan. A Phase I Environmental Site Assessment was conducted for the Downtown Neighborhoods Community Plan (DNCP) and for the FCSP area (see Attachment in Appendix F1 in this Initial Study). Because of the location of the Fulton Corridor Specific Plan (FCSP) boundaries within DNCP boundaries, the information below is from the Phase I ESA for the DNCP because the geographical area for the DNCP covers both plan areas.

A supplemental assessment to the Fulton Corridor Phase I ESA was completed by the Caltrans Hazardous Waste Branch (see Appendix F1 in this Initial Study).

In order to provide site specific, accurate, up to date information as it related to the Fulton Mall Reconstruction project, Caltrans Hazardous Waste searched the following five California Environmental Protection Agency Data Resources, commonly referred to as the 'Cortese List,' for the supplemental assessment:

- EnviroStor database, List of Hazardous Waste and Substances sites, Department of Toxic Substances Control (DTSC)
- Geotracker database, List of Leaking Underground Storage Tank sites, State Water Resources Control Board
- Sites Identified with Waste Constituents Above Hazardous Waste Levels Outside the Waste Management Unit, State Water Resources Control Board

- CDO/CAO List, List of active Cease and Desist Orders and Cleanup and Abatement Orders, State Water Resources Control Board
- List of hazardous waste facilities subject to corrective action, DTSC

In addition:

- SWIS database, Solid Waste information System, Department of Resources Recycling and Recovery (CalRecycle) was reviewed.

The database search conducted by Caltrans identified two open (actively worked on) Leaking Underground Storage Tank (LUST) cleanup sites as well as one closed case clean-up site within the Fulton Mall Reconstruction Project boundaries.

The two open cases identified within the project boundaries include Greyhound Bus Depot located at 1033 Broadway and Van Waters & Roger-Fresno Facility/Univar USA Inc located at 1152 G Street. The closed-case is for the Broadway Furniture Parking Lot.

Since the completion of the supplemental assessment, the Greyhound Bus Depot LUST case has been closed. A closure/No Further Action Letter from the Central Valley Regional Water Quality Control Board was issued on May 14, 2013 (see Appendix F2 in this Initial Study).

The Van Waters and Rogers-Fresno Facility/Univar USA Inc. site located at 1152 G Street is currently an open cleanup site with tetrachloroethene release to soil and groundwater. Investigation to assess the lateral and vertical extent of impacts to groundwater is ongoing. A remediation action plan and Report of Waste Discharge Requirements are currently being prepared. There are three monitoring wells (T1-2, T2-2, T2-3) related to the Van Waters and Rogers Site/Univar USA Inc. within the project boundaries. Despite the risk of groundwater contamination migration, construction activities are not likely to affect groundwater on the project based on the scope of work.

Broadway Furniture Parking Lot site is a closed case (a closure letter or other formal closure decision document has been issues for the site). A diesel/gasoline leak was reported on July 27, 2004 and Cleanup Action was completed on July 29, 2004. A closure/No Further Action Letter was issued on October 6, 2004. The site is under the authority of Fresno County Environmental Health.

Project Impacts

Alternative 1

No impact. Despite the risk of groundwater contamination migration from the Van Waters Rogers site, construction activities are not likely to affect groundwater on the project because groundwater levels in Downtown Fresno has historically been located at depths of 73 to 121 feet below ground surface and the maximum depth of project excavation activities is 15 feet below ground surface. In addition, there are three monitoring wells (T1-2, T2-2, T2-3) also related to the Van Waters and Rogers site; however, these wells will not be affected by construction activities due to their distance from proposed grading locations. Well T1-3 is located approximately 380 feet southwest from the affected right-of-way. Well T2-2 is located approximately 280 feet southwest from the affected right-

of-way, and Well T2-3 is located approximately 187 feet northeast from the affected right-of-way. Therefore, grading activities will not affect the groundwater monitoring wells associated with the Van Waters and Rogers-Fresno Facility site. While the vicinity of Fulton Mall contains sites that have undergone remediation activities, implementation of the project would not create a hazard to the public or the environment because each of the remediation sites are associated with groundwater and the project will not affect groundwater due to the substantial depth (73 to 121 feet) of the existing groundwater. Alternative 1 would not create a hazardous materials hazard to the public.

Alternative 2

Less than significant impact. The impacts associated with Alternative 1 would be the same for Alternative 2.

Cumulative Impacts

Less than significant impact. The contribution of the project's impact regarding being located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 is anticipated to be less than significant and not be cumulatively considerable because two listed sites maintain a closed-case status (a closure letter or other formal closure decision document has been issued for the site). In addition, construction activities are not likely to affect groundwater on the project based on the scope of work.

Airports

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?

Project Impacts

Alternative 1

No impact. The Fresno Chandler Downtown Airport is located 1.5 miles west of the project site. The proposed project site is located approximately 0.25 mile outside of the Fresno Chandler Downtown Airport Land Use Plan. Therefore, the project would not expose people to an airport safety hazard. Therefore, no impact would occur.

Alternative 2

No impact. The determination of no impact related to exposing people to the airport safety hazard described for Alternative 1 is the same for Alternative 2.

Cumulative Impacts

No impact. The project boundaries are located outside of the Fresno Chandler Downtown Land Use Plan. Therefore, Alternative 1 or 2 would result in no cumulative impacts associated with exposing people to the airport safety hazard.

Private Airstrip

f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?

Project Impacts

Alternative 1

No impact. There are is one private airstrip located in the City of Fresno (Airnav.com 2012). The private airstrip is Sierra Sky Park Airport and is located approximately 8 miles north of the project site. Due to the distance of the site from the private airstrip, the implementation of the project will result in no safety hazard impact to people associated with the project.

Alternative 2

No impact. The determination of no impact related to safety hazards associated with a private airstrip discussed in Alternative 1 above would be the same for Alternative 2.

Cumulative Impacts

No impact. The project boundaries are not located within the vicinity of a private airstrip. Therefore, Alternative 1 or 2 would not contribute to safety hazards associated with a private airstrip. Therefore, Alternative 1 or 2 would result in no cumulative impacts.

Emergency Plans

g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

The City of Fresno has an Emergency Operations Plan (EOP) that was adopted in 2008 and includes information regarding emergency response as well as emergency evacuation. The EOP provides a framework for responding to various emergencies. These emergencies could include fire, hazardous materials, earthquakes, flood, dam failure, aircraft accidents, civil disturbance, terrorism, train accidents, major vehicle accidents, extreme weather, and landslides. Due to the various roadways that are located throughout the City, emergency evacuation routes are identified depending on the emergency.

Project Impacts

Alternative 1

No impact. The project will open the Fulton pedestrian mall to through traffic. The project will be part of a circulation plan that would allow people to evacuate in the event of an emergency and ensure proper access for emergency response vehicles. The provision of streets within Fulton Mall will not adversely impact emergency evacuation or emergency response. Furthermore, Alternative 1 would not impact the implementation of the City's adopted Emergency Operations Plan.

Alternative 2

No impact. The determination of no impact to the emergency response or emergency evacuation components of the City's Emergency Operation Plan as addressed above for Alternative 1 is the same for Alternative 2.

Cumulative Impacts

No impact. Since Alternative 1 or 2 would result in no impacts, neither alternative would contribute to cumulative impacts. Therefore, Alternative 1 or 2 would result in no cumulative impacts associated with physically interfering with the City's adopted Emergency Operation Plan that addresses emergency response and emergency evacuation.

Wildland Fires

h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?

Project Impacts

Alternative 1

No impact. The proposed project would be entirely located in a highly urbanized area and would not be near or adjacent to wildlands. Therefore, no impacts associated with wildland fires would occur related to the proposed project.

Alternative 2

No impact. The potential impact associated with wildland fires would be the same as described above for Alternative 1.

Cumulative Impacts

No impact. Since Alternative 1 or 2 would not expose people or structures to wildland fires, neither alternative would result in cumulative impacts.

3.9 - Hydrology and Water Quality

Water Quality Standards and Requirements

a) Violate any water quality standards or waste discharge requirements?

Short Term

Construction of the proposed Fulton Mall project would require reconstruction activities that would disturb more than one acre. During these activities, there would be a potential for stormwater flows to carry onsite sediments, debris, and constituents into the existing storm drainage facilities that serve the project area. Once within the storm drainage system, these materials could be conveyed downstream and into local waterways Since these materials have the potential to enter the storm drainage system during the construction phase, there is a potential for the proposed project to degrade water quality. The project area, as well as the City of Fresno, is underlain by a single,

unconfined aquifer. In light of this, any degradation of water quality within this aquifer would be especially problematic, as the groundwater basin within the project area has been designated as a Sole Source Aquifer as authorized by Section 14246 of the Federal Safe Drinking Water Act of 1974.

Project construction would also require the use of gasoline- and diesel-powered equipment and vehicles, including bulldozers, backhoes, flatbed trucks, water pumps, and air compressors. Chemicals such as gasoline, diesel fuel, oils, paints, and solvents would likely be used during project construction. An accidental release of any of these substances could degrade the quality of stormwater runoff and contribute additional sources of pollution into the storm drainage system.

Long-Term
Based on highway storm water runoff data collected by the Caltrans Storm Water Research and Monitoring Program, typical pollutants from California highways include heavy metals, sediment, and litter. All constituents and parameters in nearby surface water bodies found to be elevated or exceeding published water quality standards could be potential concerns for the proposed project.

The pedestrian mall is currently served by 95 storm drain inlets that collect surface flows from the project area. Adjacent streets such as Fresno and Tulare Streets also have their own storm drain facilities that convey flows from the roadway. Both the onsite and adjacent storm drain facilities presently connect with the existing storm drain facilities located throughout the Fulton Mall vicinity. These existing storm drain facilities are connected to one of several larger east-west and northeast-southwest trending trunk lines, which eventually connect with a series of existing drainage basins located along S. West Street in the southwestern portion of the City of Fresno.

Project Impacts

Alternative 1

Less than significant impact with mitigation incorporated. Implementation of this alternative would eliminate the Fulton Mall and introduce two-way streets that would provide vehicular interconnectivity to adjacent roadways.

Short-term Construction
Construction activities associated with this alternative could generate pollutants such as increased silt, ground rubber, oils from automobiles, debris, litter, chemicals, dust, and dissolved solids related to grading and excavation. Since construction activities could result in increased pollutants to surface water, the proposed project could result in short-term potential to degrade water quality. This impact during construction activities is considered potentially significant.

However, there are regulatory mechanisms in place that would reduce the effects of project construction on water quality, including the National Pollutant Discharge Elimination System (NPDES) General Permit. Construction of the proposed project would be required to comply with the requirements of the NPDES General Permit. The NPDES Permit Program, which is administered by the Central Valley RWQCB, helps control water pollution by regulating point sources that discharge pollutants into receiving waters during both construction and operations activities.

Construction of the Fulton Mall project would be required to comply with all applicable requirements of the NPDES Permit Program, which includes the preparation and participation with the Construction General Permit and implementation of a SWPPP and BMPs. Combined, compliance with these requirements would reduce short-term construction impacts on water quality to a less than significant level.

Long-term Operation
This alternative would be subject to the NPDES Permit Program, which controls water pollution by regulating point sources that discharge pollutants into receiving waters during both construction and operations activities. Because of the nature of improvements to the Fulton Mall under Alternative 1, it is not anticipated to violate any water quality standards or waste discharge requirements.

Mitigation Measure

MM HWQ-1 Prior to the issuance of a grading permit, specific locations of relocated storm drain inlets within the existing malls shall be approved by the City of Fresno Public Works Department.

MM HWQ-2 Prior to issuance of a grading permit, a response plan for accidental spills of hazardous materials such as oil or gasoline during construction activities shall be prepared.

Alternative 2

Less than significant impact with mitigation incorporated. The determination of less than significant impacts with mitigation incorporated related to construction water quality as described in Alternative 1 above would be the same for Alternative 2.

Mitigation Measures

Implementation of Mitigation Measures HWQ-1 and HWQ-2 is required.

Cumulative Impacts

Less than significant impact with mitigation incorporated. Compliance with all applicable requirements of the NPDES Permit Program, which includes the preparation and participation with the construction General Permit and implementation of a SWPPP and BMPs would ensure that cumulative impacts resulting from water quality or discharge violations to less than significant. However, in the case of accidental spills of hazardous materials such as oil or gasoline, Alternative 1 or 2 could contribute to potential significant impacts to water quality. Therefore, the water quality impact from Alternative 1 or 2 could result in a potential significant cumulative impacts.

Mitigation Measures

Implementation of Mitigation Measures HWQ-1 and HWQ-2 is required.

Groundwater Supplies and Recharge

b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted?

The City of Fresno is underlain by the Kings River Subbasin, which, along with 6 other subbasins, comprises the San Joaquin Basin. In turn, the San Joaquin Basin is located within the Tulare Lake Hydrologic Region. The Tulare Lake Hydrologic Region spans approximately 10.9 million acres (17,000 square miles) and includes most of Fresno County. The Region encompasses the southern one-third of the Central Valley Regional Water Quality Control Board (RWQCB).

Groundwater quality throughout the Tulare Lake Hydrologic Region is generally suitable for most urban and agricultural uses, and meets primary and secondary drinking water standards for municipal use. Local impairments are found in the Tulare Lake Hydrologic Region's groundwater supply, however, with high total dissolved solids (TDS), nitrate, arsenic, and organic compounds acting as the primary constituents of concern within the Region. With the exception of western portion of the Tulare Lake Hydrologic Region, the Region lacks any substantial low permeability units that would isolate deep from shallow aquifers. As such, most of the aquifer underlying the project area is unconfined. As a single, unconfined aquifer, the groundwater basin within the project area has been designated as a Sole Source Aquifer as authorized by Section 14246 of the Federal Safe Drinking water Act of 1974. This designation means that project area is dependent on a single source of groundwater and that this sole source must be protected from contamination.

While the groundwater supply within the Kings River Subbasin generally meets drinking water standards, with the exception of the northwest portion of the City, extensive contamination occurs throughout the City. Of the City's 272 groundwater wells, 96 wells are impacted by one contaminant plume, 33 wells are impacted by two contaminant plumes, and 5 wells are impacted by three contaminant plumes. Thirty-four of the City's active wells currently have wellhead treatment systems.

Project Impacts

Alternative 1

Less than significant impact. Implementation of this alternative would eliminate the Fulton Mall and introduce two-way streets that would provide vehicular interconnectivity to adjacent roadways; no new businesses or housing are proposed, that could create a substantial demand on groundwater resources. Surface water drainage from the Fulton Mall study area is conveyed to existing retention basins that are used to recharge groundwater.

This alternative is anticipated to have a less than significant impact regarding groundwater supplies and recharge because the Fulton Mall is currently paved over and this would remain the case with this alternative. Under this alternative, the streets would be paved with asphalt and would remain as an impervious area. Thus, this alternative is anticipated to have a less than significant impact regarding depletion of groundwater supplies and ground water recharge.

Alternative 2

Less than significant impact. The determination of less than significant impacts regarding groundwater and recharge as described above for Alternative 1 would be the same for Alternative 2.

Cumulative Impacts

Less than significant impact. Implementation of the project as well as cumulative development in Downtown Fresno is not expected to result in substantial effects on groundwater recharge because the existing storm drain system conveys water to existing recharge basins. Future development is not expected to remove existing recharge basins. Therefore, cumulative impacts on groundwater recharge would be less than significant. As a result, the implementation of Alternative 1 or 2 would have a less than significant impact.

The project and cumulative development will increase the demand on water supplies. However, based on a review of the City of Fresno Urban Water Management Plan (UWMP), the City's future water supply plan is to reduce the amount of groundwater that is used to meet future water demand (City of Fresno UWMP, Figure 4-3). Therefore, cumulative impacts on existing groundwater supplies would be less than significant. As a result, the implementation of Alternative 1 or 2 would have less than significant cumulative impacts on groundwater supplies.

Drainage Pattern: Erosion or Siltation

c) Substantially alter the existing drainage pattern of area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?

The existing Fulton Mall is currently developed and located within a highly urbanized area in the City of Fresno. The Fresno River is located approximately 5 miles north of the proposed project boundary.

Project Impacts

Alternative 1

No impact. Implementation of this alternative would eliminate the Fulton Mall and introduce two-way streets that would provide vehicular interconnectivity to adjacent roadways.

This alternative would not alter the course of a stream or river as the site is currently developed with the existing Fulton Mall. Therefore, there would be no impact.

Alternative 2

No impact. The determination of no impact regarding alteration of a stream or river as described above for Alternative 1 would be the same for Alternative 2.

Cumulative Impacts

No impact. Implementation of the project would not alter the course of a stream or river. Therefore, the project would not be cumulatively considerable and therefore would result in no cumulative impact.

Drainage Pattern: Flooding

d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?

The existing Fulton Mall is currently developed and located within a highly urbanized area in the City of Fresno. The Fresno River is located approximately 5 miles north of the proposed project boundary.

Project Impacts

Alternative 1

Less than significant impact. Implementation of this alternative would eliminate the Fulton Mall and introduce two-way streets that would provide vehicular interconnectivity to adjacent roadways.

This alternative would not alter the course of a stream or river as the site is currently developed with the existing Fulton Mall. This alternative is not anticipated to substantially alter the existing drainage pattern of the site or area or substantially increase the rate or amount of surface runoff because the Mall is currently covered by impervious surfaces and this would be the case under Alternative 1.

Alternative 2

Less than significant impact. The determination of less than significant impact on drainage patterns as described above for Alternative 1 would be the same for Alternative 2.

Cumulative Impacts

Less than significant impact. Implementation of the Alternative 1 or 2 would not substantially alter drainage patterns. The project's potential contribution to cumulative alterations to drainage patterns would be less than cumulatively considerable and thus less than cumulatively significant.

Runoff Water and Drainage Systems

e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

The primary surface water feature within the City of Fresno is the San Joaquin River, which generally serves as the City's northern boundary. At 366 miles long, the San Joaquin River is the largest river in Central California, spanning from the Sierra Nevada Mountains to the San Francisco Bay via the San Joaquin Valley. Much of the water that flows through the San Joaquin River is used for irrigation purposes, as much of the agricultural production in the San Joaquin Valley depends on water that at least originated in the River.

The San Joaquin River has been identified by the Central Valley Region Water Quality Control Board (RWQCB) as having numerous beneficial uses, including municipal and domestic water supply, agricultural, industrial, recreational, freshwater and wildlife habitat, and migration and spawning grounds. Water quality in the San Joaquin River is affected by both natural and anthropogenic

sources, including soil erosion; stormwater runoff; wastewater discharges, industrial, residential, and agricultural runoff; recreational activity; and flora and fauna. While the segment of the San Joaquin River in the City is not considered substantially impaired, significant downstream portions of the River throughout the Valley and near the Sacramento-San Joaquin Delta are affected by various constituents and pollutants, usually because of agricultural runoff. The portion of the San Joaquin River in the City does, however, appear on the State Water Resources Control Board's 2010 Impaired Water Bodies/303(d) List for invasive species (non-native fish species).

In addition to the San Joaquin River, a network of agricultural canals and flood control channels traverse the City. Numerous agricultural ponds, recharge basins, and other similar features also dot the City's landscape.

Project Impacts

Alternative 1

Less than significant impact. Implementation of this alternative would eliminate the Fulton Mall and introduce two-way streets that would provide vehicular interconnectivity to adjacent roadways.

Although Alternative 1 would potentially reintroduce vehicles onto Fulton, Mariposa, Merced, and Kern Streets, the project would not decrease the amount of infiltration areas found in the project area. The concrete pedestrian areas that currently comprise the project area would be replaced with asphalt streets. The distribution of the paved impervious surfaces under Alternative 1 may nominally change in the project area; however, the impervious surface area would not substantially change. Thus, Alternative 1 would not increase the volume of surface flows generated in the project area, which could potentially convey roadway pollutants and other constituents. The 90-plus inlets that are presently distributed through the project area would be removed, and new storm drain facilities would take their place. Similar to existing facilities that serve the streets adjacent to the Fulton Mall, these new storm drain facilities would connect with a series of storm drain lines that crisscross the project area, eventually connecting with larger trunk lines and conveying stormwater into drainage basins located to the west. Since surface flow volumes would not substantially increase as a result of the project, it is expected that the existing drainage distribution facilities, coupled with the new storm drain facilities that would be constructed as part of the new streets, would be adequate to serve both the proposed project and existing uses. As such, the existing and new storm drain facilities could adequately collect, convey, and distribute onsite surface flows, as well as any pollutants contained within, before stormwater and constituents are permitted to enter downstream surface water bodies.

Alternative 2

Less than significant impact. The determination of less than significant impacts from storm water runoff as described for Alternative 1 would be the same for Alternative 2.

Cumulative Impacts

Less than significant impact. The distribution of the paved impervious surfaces under project Alternatives 1 and 2 may nominally change in the project area; however, the impervious surface area would not substantially change. Thus, project implementation would not increase the volume of

surface flows generated in the project area, which could potentially convey roadway pollutants and other constituents. The 90-plus inlets that are presently distributed through the project area would be removed, and new storm drain facilities would take their place. Similar to existing facilities that serve the streets adjacent to the Fulton Mall, these new storm drain facilities would connect with a series of storm drain lines that crisscross the project area, eventually connecting with larger trunk lines and conveying stormwater into drainage basins located to the west. Since surface flow volumes would not substantially increase as a result of the project, it is expected that the existing drainage distribution facilities, coupled with the new storm drain facilities that would be constructed as part of the new streets, would be adequate to serve both the proposed project and existing uses. As such, the existing and new storm drain facilities could adequately collect, convey, and distribute onsite surface flows, as well as any pollutants contained within, before stormwater and constituents are permitted to enter downstream surface water bodies. Therefore, implementation of the project would be less than cumulatively considerable result in less than significant cumulative impacts.

Water Quality

f) Otherwise substantially degrade water quality?

Short Term
Construction of the proposed Fulton Mall project would require reconstruction activities that would disturb more than one acre. During these activities, there would be a potential for stormwater flows to carry onsite sediments, debris, and constituents into the existing storm drainage facilities that serve the project area. Once within the storm drainage system, these materials could be conveyed downstream and into local waterways. Since these materials have the potential to enter the storm drainage system during the construction phase, there is a potential for the proposed project to degrade water quality. As addressed in the Environmental Setting discussion above, the project area is underlain by a single, unconfined aquifer. In light of this, any degradation of water quality within this aquifer would be especially problematic, as the groundwater basin within the project area has been designated as a Sole Source Aquifer as authorized by Section 14246 of the Federal Safe Drinking Water Act of 1974.

Project construction would also require the use of gasoline- and diesel-powered equipment and vehicles, including bulldozers, backhoes, flatbed trucks, water pumps, and air compressors. Chemicals such as gasoline, diesel fuel, oils, paints, and solvents would likely be used during project construction. An accidental release of any of these substances could degrade the quality of stormwater runoff and contribute additional sources of pollution into the storm drainage system.

Long-Term
Based on highway storm water runoff data collected by the Caltrans Storm Water Research and Monitoring Program, typical pollutants from California highways include heavy metals, sediment, and litter. All constituents and parameters in nearby surface water bodies found to be elevated or exceeding published water quality standards could be potential concerns for the proposed project.

The pedestrian mall is currently served by 95 storm drain inlets that collects surface flows from the project area. Adjacent streets such as Fresno and Tulare Streets also have their own storm drain

facilities that convey flows from the roadway. Both the onsite and adjacent storm drain facilities presently connect with the existing storm drain facilities located throughout Fulton Mall vicinity, as addressed in the Environmental Setting discussion above. These existing storm drain facilities are connected to one of several larger east-west and northeast-southwest trending trunk lines, which eventually connect with a series of existing drainage basins located along S. West Street in the southwestern portion of the City of Fresno.

Project Impacts

Alternative 1

Less than significant impact. Implementation of this alternative would eliminate the Fulton Mall and introduce two-way streets that would provide vehicular interconnectivity to adjacent roadways.

Construction of Alternative 1 would require reconstruction activities that would disturb more than one acre. During these activities, there would be a potential for stormwater flows to carry onsite sediments, debris, and constituents into the existing storm drainage facilities that serve the project area. Once within the storm drainage system, these materials could be conveyed downstream and into local waterways. Since these materials have the potential to enter the storm drainage system during the construction phase, there is a potential for the proposed project to degrade water quality. The project area is underlain by a single, unconfined aquifer. In light of this, any degradation of water quality within this aquifer would be especially problematic, as the groundwater basin within the project area has been designated as a Sole Source Aquifer as authorized by Section 14246 of the Federal Safe Drinking water Act of 1974.

Project construction would also require the use of gasoline- and diesel-powered equipment and vehicles, including bulldozers, backhoes, flatbed trucks, water pumps, and air compressors. Chemicals such as gasoline, diesel fuel, oils, paints, and solvents would likely be used during project construction. An accidental release of any of these substances could degrade the quality of stormwater runoff and contribute additional sources of pollution into the storm drainage system.

There are, however, regulatory mechanisms in place that would reduce the effects of project construction on water quality, including the National Pollutant Discharge Elimination System (NPDES) General Permit. Construction of the proposed project would be required to comply with the requirements of the NPDES General Permit. The NPDES Permit Program, which is administered by the Central Valley RWQCB, helps control water pollution by regulating point sources that discharge pollutants into receiving waters during both construction and operations activities.

Any development project disturbing more than one acre of soil must obtain coverage under the General Permit for Discharges of Storm Water Associated with Construction Activity (Construction General Permit Order 2009-0009-DWQ). Construction activities subject to the Construction General Permit includes clearing, grading, and other ground- disturbing activities such as stockpiling or excavation. The Construction General Permit requires development and implementation of a Storm Water Pollution Prevention Plan (SWPPP). Among other mandated items that are included in a SWPPP, the SWPPP would contain features designed to protect against substantial soil erosion as a result of water and wind erosion, known as Best Management Practices (BMPs). Common BMPs

include maintaining or creating drainages to convey and direct surface runoff from bare areas and installing physical barriers such as berms, silt fencing, waddles, straw bales, and gabions.

Construction of the Fulton Mall project would be required to comply with all applicable requirements of the NPDES Permit Program, which includes the preparation and participation with the Construction General Permit and implementation of a SWPPP and BMPs. Combined, compliance with these requirements would reduce short-term construction impacts on water quality to a less than significant level.

Potential Long-Term Operational Impacts
Based on highway storm water runoff data collected by the Caltrans Storm Water Research and Monitoring Program, typical pollutants from California highways include heavy metals, sediment, and litter. All constituents and parameters in nearby surface water bodies found to be elevated or exceeding published water quality standards are potential concerns for the proposed project. If the reconstruction of the streets within Fulton Mall proves to be a significant source of constituents that cause degradation of water quality and associated beneficial uses of water, then there is a potential for the proposed project to degrade water quality.

Under Alternative 1, the distribution of the paved impervious surfaces may nominally change in the project area; however, the impervious surface area would not substantially change. Thus, Alternative 1 would not increase the volume of surface flows generated in the project area, which could potentially convey roadway pollutants and other constituents. The 90-plus inlets that are presently distributed through the project area would be removed, and new storm drain facilities would take their place. Similar to existing facilities that serve the streets adjacent to the Fulton Mall, these new storm drain facilities would connect with a series of storm drain lines that crisscross the project area, eventually connecting with larger trunk lines and conveying stormwater into drainage basins located to the west. Since surface flow volumes would not substantially increase as a result of the project, it is expected that the existing drainage distribution facilities, coupled with the new storm drain facilities that would be constructed as part of the new streets, would be adequate to serve both the proposed project and existing uses. As such, the existing and new storm drain facilities could adequately collect, convey, and distribute onsite surface flows, as well as any pollutants contained within, before stormwater and constituents are permitted to enter downstream surface water bodies. By adequately collecting and containing the majority of onsite surface flows and pollutants, long-term operations impacts to water quality would be reduced to a less than significant level.

Alternative 2
Less than significant impact. The determination of less than significant impacts to water quality as discussed above for Alternative 1 would be the same for Alternative 2.

Cumulative Impacts

Less than significant impact. Implementation of the project would be required to comply with all applicable requirements of the NPDES Permit Program, which includes the preparation and participation with the Construction General Permit and implementation of a SWPPP and BMPs. Additionally, the project is not anticipated to increase the volume of surface flows generated in the

project area, which could potentially convey roadway pollutants and other constituents. Compliance with applicable requirements and adequately collecting and containing the majority of onsite surface flows and pollutants would reduce the project impacts to less than cumulatively considerable.

Housing Placement: Flood Hazard Area

g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?

The project site is located within an urbanized area in the City of Fresno. Based on a review of the Federal Emergency Management Agency (FEMA) Flood Insurance Map for the project site, the Fulton Mall is not located within a 100-year flood hazard area. This site is within Zone X which is Other Flood Area. According to the FEMA Map, Other Flood Areas are areas of 0.2 percent chance of flood and not considered a 100-year flood.

Project Impacts

Alternative 1

No impact. Implementation of this alternative would not include the development of housing. Therefore, this Alternative would not impact housing that is located within a 100-year flood hazard area.

Alternative 2

No impact. The determination of no potential for flooding of housing within the project boundaries as described for Alternative 1 would be the same for Alternative 2.

Cumulative Impacts

No impact. Since the project does not include housing, the project would not result in cumulative impact on housing within a 100-year flood hazard.

Structures: Flood Hazard Area

h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?

As stated above in CEQA Checklist Question 3.9 g), the project site is not located within a 100-year flood hazard area.

Project Impacts

Alternative 1

No impact. Since the project site is not located within a 100-year flood hazard area, Alternative 1 would result in no impacts to flood flows.

Alternative 2

No impact. The determination of no impact to flood flows as discussed in Alternative 1 would be the same for Alternative 2.

Cumulative Impacts

No impact. Since the project site is not located within a 100-year flood hazard area, Alternative 1 or 2 would result in no impacts to flood flows and would not contribute to any potential cumulative impacts.

Flooding

i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?

Project Impacts

Alternative 1

Less than significant impact. Refer to the discussion under CEQA Checklist Question 3.9 h) above regarding potential impacts related to flood hazards. The following four dams have the potential to result in flooding to portions of the City of Fresno should a failure occur:

- **Friant Dam** - The Friant Dam is located approximately 18 miles north from the project site.
- **Big Dry Creek Dam** - The Big Dry Creek Dam is located approximately 12 miles northeast from the project site.
- **Pine Flat Dam** - The Pine Flat Dam is located approximately 27 miles northeast from the project site.
- **Redbank-Fancher Creek Projects (Redbank Dam)** - The Redbank-Fancher Creek Projects (Redbank Dam) located approximately 13 miles northeast from the project site.

Per the Fresno Metropolitan Flood Control District Benefit and Cost Analysis, which was conducted for the estimated cost for the toe drain modification at Big Dry Creek Dam, if there were a failure at Big Dry Creek Dam, the estimated inundation would impact the Fulton Mall, which would be flooded between approximately 14 hours after dam failure. However, less than significant impacts are anticipated in this regard because development within the mall would be required to be flood proof in accordance with the City of Fresno floodplain ordinance and 40CFR60.

Alternative 2

Less than significant impact. The determination of less than significant impacts for flooding from dam failure described in Alternative 1 would be the same for Alternative 1.

Cumulative Impacts

Less than significant impact. The development of Alternative 1 or 2 would not contribute to potential flooding from dam failure. Therefore, the project would not result in cumulative impacts.

Seiche, Tsunami, or Mudflow

j) Inundation by seiche, tsunami, or mudflow?

The Fulton Mall is located along the east margin of the southern San Joaquin Valley portion of the Great Valley Geomorphic Province of California. The San Joaquin Valley is bordered to the north by the Sacramento Valley portion of the Great Valley, to the east by the Sierra Nevada, to the west by the Coast Ranges, and to the south by the Transverse Ranges. The project site is located approximately 12 miles from Big Creek Dry Dam, and approximately 110 miles from the Pacific Ocean, the source of a potential tsunami.

Project Impacts

Alternative 1

No impact. Because of this distance and the intervening Coast Ranges, there is no potential for a tsunami to impact the project site and no impacts would result. The nearest body of water capable of producing a seiche during a seismic event, wind event, or sudden change in barometric pressure is Big Creek Dry Dam located approximately 12 miles from the project site. The intervening distance would preclude any water displaced by oscillation from reaching the project site. The project site and vicinity is located on level ground and represents a built-up urban environment without slopes capable of producing mudflows. Therefore, the implementation of Alternative 1 would not be impacted from inundation by seiche, tsunami, or mudflow.

Alternative 2

No impact. The determination of no impact associated with inundation by seiche, tsunami, or mudflow described for Alternative 1 would be the same for Alternative 1.

Cumulative Impacts

No impact. Alternative 1 or 2 would result in no impacts from inundation, and therefore would not contribute to any cumulative inundation impact.

3.10 - Land Use and Planning

Divide Established Community

a) Physically divide an established community?

Project Impacts

Alternative 1

No impact. Implementation of Alternative 1 would not result in a change to the population, income, or housing characteristics within the vicinity of Fulton Mall. Although residents live within the vicinity of Fulton Mall, they are located within apartment complexes that are separated by at least one block. Therefore, these apartment complexes do not create a residential neighborhood. The development of the project would not directly affect any of the apartment complexes. Therefore, Alternative 1 would not physically divide an established community.

Alternative 2

No impact. The determination of no impact on an established community described in Alternative 1 would be the same for Alternative 2.

Cumulative Impacts

No impact. Given that Alternative 1 or 2 would not divide an established community, Alternative 1 or 2 would not contribute to any potential cumulative impacts.

Conflict with Applicable Plans, Policies, or Regulations

b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?

Various plans and programs are applicable to the proposed project. These applicable plans and programs are listed below.

Transportation Plans

Fresno COG is an association of city and county governments created to address regional transportation issues as well as other regional issues. Its members include the County of Fresno and the 15 incorporated cities within the County.

Fresno COG develops long-term solutions for regional challenges such as transportation, air quality, growth management, hazardous waste management, and air quality. Because these issues cross city and county boundaries, Fresno COG works with cities, counties, and public agencies in the region to develop plans and strategies to address regional issues. The Fresno COG has developed strategies that specifically address the growth and transportation issues facing Southern California as documented in adopted plans including the Regional Transportation Plan (RTP, adopted in 2011), the Federal Transportation Improvement Program (FTIP, adopted in 2012 and 2013), and the Federal Statewide Transportation Improvement Plan (FSTIP, adopted 2012). Following is a discussion of each of these plans and program.

Regional Transportation Plan

Transportation control measures provided by Fresno COG include those contained in the Regional Transportation Plan (RTP), the most current version of which is the 2011 RTP. The 2011 RTP has control measures to reduce emissions from on-road sources by incorporating strategies such as high occupancy vehicle interventions, transit, and information-based technology interventions. The measures implemented by Air Resources Board and Fresno COG affect the Project indirectly by regulating the vehicles that the residents may use and regulating public transportation.

The project is included in the 2011 RTP through 2011 RTP Amendment #2 as Project ID FRE500768. The FHWA and FTA completed review of the conformity determination for the 2011 RTP and found that the document conforms to the applicable state implementation plan in accordance with the provisions of 40 CFR Parts 51 and 93. The FHWA and FTA issued the determination on December 14,

2010. The FHWA and FTA issued a determination of conformity for the 2011 RTP Amendment #2 on December 14, 2012.

Fresno COG is currently circulating the 2014 RTP for informal and early public review and comment. The 2014 RTP, also called the Regional Transportation Plan 2040, charts a 25-year course to the year 2040. The 2014 RTP addresses greenhouse gas emission reductions and other air emissions with a goal of sustainable planning.

Federal Statewide Transportation Improvement Plan

The Federal Statewide Transportation Improvements Plan (FSTIP) covers a four-year period from 2012/2013 through 2015/2016, which includes the listings of proposed transportation projects in the rural non MPO areas of the sate, and incorporates by reference projects listed in the MPO's 2013 FTIPs. Fresno COG submitted their board-approved 2013 FTIP to Caltrans, including 2013 FTIP Amendment #1 made August 2012. The FSTIP was transmitted from Caltrans to FHWA on November 5, 2012. The FHWA and FTA completed review of California's 2013 FSTIP, and approved the document as proposed. The FHWA and FTA determined the 2013 FSTIP conforms to the SIP on December 14, 2012. The 2013 FSTIP incorporated by reference those projects included in the 2012/2013 Federal Transportation Improvement Programs (FTIP) adopted by the MPOs in California. This conformity determination includes Fresno COG 2013 FTIP Amendment #1, which lists the project.

Federal Transportation Improvement Plan

The FTIP is a compilation of project lists from the State Transportation Improvement Program (STIP), urbanized and non-urbanized areas, and other programs using federal funding. The 2013 FTIP is composed of two parts. The first is a priority list of projects and project segments to be carried out in a four-year period. The second is a financial plan that demonstrates how the TIP can be implemented. The project was included in the 2013 FTIP Appendix F, Regional Transportation Plan Project Listing 2011 through 2035, as RTP ID FRE500768. The project was also included in 2013 FTIP Amendment #1, dated August 2012, as Project ID FRE130069. Since the 2013 FSTIP incorporated by reference those projects included in the 2012/2013 Federal Transportation Improvement Programs (FTIP) adopted by the MPOs in California, this conformity determination includes Fresno COG 2013 FTIP Amendment #1, which lists the project.

City of Fresno 2025 General Plan

The City of Fresno 2025 General Plan was adopted in 2002 and currently serves as a guide to enable government at all levels, private enterprise, community groups, and individual citizens to make decisions and utilize community resources in a manner that will realize progress toward a common vision of a measurably enhanced physical, economic, and social environment.

Following are the applicable goals and policies of the City of Fresno 2025 General Plan which are included in the Public Facilities Element.

- **Policy E-1-a:** Implement the following classified street system in accordance with adopted engineering design standards and the 2025 Fresno General Plan Land Use and Circulation Map

(Exhibit 4) and the Transportation (Streets and Highways) Element Map (Exhibit 7) adopted and incorporated herein depicting the location and general alignment of streets and highways.

- **Policy E-1-f:** Allow a Level of Service "D" ("LOS D") as the acceptable level of traffic congestion on major streets. LOS "D" according to the Caltrans and COFCG accepted LOS criteria, as developed by the Florida Department of Transportation, means moderate congestion at peak traffic periods; approaching unstable flow with reduced speeds, limited maneuverability, and loss of convenience; average speeds range from 9 to 17 miles per hour on arterials with stopped delays of 40 seconds or less.
- **Policy E-2-h:** Limit the number of driveway access points on all major streets to minimize traffic disruption and protect traffic flows. No development shall be approved if it will adversely affect the flow of traffic on a public street below an acceptable standard to be determined by the Public Works Director and based upon the policies noted herein.

City of Fresno Draft General Plan Update

The City of Fresno has prepared and made available for public review a comprehensive update to its General Plan, which is anticipated to be adopted in 2014. The update provides a policy direction for the long-term development and maintenance of the City. It provides guidance to decision-makers when making determinations about the allocation of resources and the future physical form and character of development in the City. The land uses and circulation system within the General Plan Update are consistent with the proposed land uses and circulation system proposed in the Downtown Neighborhoods Community Plan (DNCP) and Fulton Corridor Specific Plan (FCSP). The General Plan Update proposes that the Downtown planning area would be further refined through specific and community plans, such as the proposed DNCP and FCSP, and further implemented through updates to the Development Code for regulations specific to the Downtown. The goals within the DNCP and FCSP are being proposed as objectives within the General Plan Update to ensure consistency between the General Plan Update and the DNCP and FCSP.

The following proposed policies from the Fresno General Plan Update are applicable to the proposed project.

- **Goal MT-1:** Create and maintain a transportation system that is safe, efficient, provides access in an equitable manner, and optimizes travel by all modes.
- **Policy MT-1-h:** "Complete Streets" Concept Implementation. Provide transportation facilities upon a "Complete Streets" concept that facilitates and balanced use of all travel modes (pedestrians, bicyclists, motorists, and transit users), meeting the transportation needs of all ages and abilities and providing mobility for a variety of trip purposes. Implementation actions will include:
  - Meeting the needs of all users within the street system as a whole; each individual street does not need to provide all modes of travel, but travel by all modes must be accommodated throughout the planning area;
  - Continuing to adopt refined street cross-section standards as appropriate in response to needs identified;
  - Considering the impact of streets on public health by addressing storm water runoff quality, air quality, and water conservation among other factors; and

- Adhering to the City's Water Efficient Landscape Ordinance for median and streetscape plantings and irrigation methods.

- **Policy UF-11:** Revitalize the Fulton Mall.

Central Area Community Plan

The Central Area Community Plan was approved in 1989 and encompasses approximately 1,500 acres bound by Highway 99, Highway 41 and Highway 180. The Community Plan provides a tool for the future development of the planning area. Following are the goal and policies of the Community Plan that are applicable to the proposed project.

- **Fulton Mall District Goal:** Retain the Fulton Mall as a multifunctional, primarily pedestrian environment and improve its physical condition and economic vitality as a District with strong linkages to other Central Area activity centers; and promote the image of this District as a high quality, unique, comfortable and secure area which is accessible and attractive for business, recreation, tourism and a variety of special activities.

Essential to this setting is proximity of significant and attractive housing opportunities within the Central Area, and an environment reflective of the community's appreciation for its cultural diversity and historic importance.

- **Fulton Mall District Policy 1:** Enhance linkage between the Fulton Mall District and other Central Area districts to strengthen interaction between them. Improve vehicular and pedestrian circulation around and access within the Fulton Mall District to optimize public convenience and safety, consistent with high standards of aesthetic quality.
- **Fulton Mall District Policy 2:** Reinforce the emerging "three-node pattern: of retail, service and office activities with the north node principally as a public/private urban office park; the central node, as a blend of specialty shops, private and government offices; and south node, mainly as a diverse mix of unique retail shopping and services which cater to Central Area employees, residents, tourists and shoppers.
- **Fulton Mall District Policy 4:** Improve the appearance of public and private property through measures that result in a high level of maintenance.
- **Fulton Mall District Policy 5:** Encourage the redesign and remodeling of functionally obsolete office and retail business buildings to accommodate new uses that will stimulate activity along Fulton Mall network.
- **Fulton Mall District Policy 6:** Establish and maintain an environment characterized by enhanced security, public convenience, easy access and orientation.
- **Fulton Mall District Policy 8:** Improve and maintain the Fulton Mall as an exciting, physically and visually superior pedestrian environment for the people of Fresno, the San Joaquin Valley and the world.

Draft Downtown Neighborhood Communities Plan

The City of Fresno has prepared and made available for public review the draft Downtown Neighborhoods Community Plan (DNCP), which is anticipated to be adopted in 2014. If adopted, the

DNCP would be the community's tool for guiding the successful regeneration of Downtown Fresno and its surrounding neighborhoods. The Plan provides long-term goals for the Plan Area and detailed policies concerning a wide range of topics, including land use and development, transportation, the public realm of streets and parks, infrastructure, historic resources, and health and wellness. The project site is located near the center of the DNCP, which encompasses 7,290 acres.

Following are the applicable goals and policies of the draft DNCP.

- **Goal 3.3:** Create a network of complete streets and multi-modal transportation strategies.
- **Policy 3.3.1:** Create "complete streets" in the Downtown Neighborhoods so that all streets accommodate the needs of all potential users - vehicles, pedestrians, cyclists, transits vehicles and freight.
- **Policy 3.3.6:** Prioritize space for pedestrians and bicycles in the design and improvement of public right-of-way. As part of the implementation of this policy, design new roadways or retrofit existing roadways to have wider sidewalks and/or an improved pedestrian-oriented streetscape.
- **Policy 3.3.8:** In order to decrease conflicts between automobiles and pedestrians, consolidate existing and minimize new curb cuts and driveways throughout the Plan Area.
- **Goal 3.4:** Physically improve the Downtown Neighborhoods' roadways and manage the transportation system to enhance safety and quality of life.
- **Policy 3.4.3:** Reestablish an interconnected street grid comparable to Fresno's original grid pattern in order to increase walkability and improve connections to parks, open space, schools, and neighborhood centers.

Draft Fulton Corridor Specific Plan

The City of Fresno has prepared and made available for public review the draft Fulton corridor Specific Plan (FCSP), which is anticipated to be adopted in early 2014. If adopted, the FCSP would be the community's tool for guiding the future development of Downtown Fresno. The Plan provides long-term goals for the FCSP area and detailed policies concerning a wide range of topics, including land use and development, historic resources, the public realm, transportation, and infrastructure. The project site is located near the center of the FCSP, which encompasses 655 acres. The FCSP is located within the DNCP.

Following are the applicable goals and policies of the draft FCSP.

- **Goal 9-1:** Provide a comprehensive transportation, circulation, and parking system that improves quality of life in Downtown.
- **Policy 9-1-2:** Design new roadways or retrofit existing roadways to have wider sidewalks and a pedestrian-oriented streetscape.
- **Policy 9-1-4:** Along Commercial and mixed-use streets, minimize driveways and driveway crossings of the pedestrian right-of-way.
- **Policy 9-1-6:** Install new or retain existing on-street parking (parallel or angles) along all streets, except where precluded by lack of curb-side access or right-of-way. The type of parking shall depend on the adjacent land use and roadway classification.

- **Policy 9-1-12:** Reestablish an interconnected street grid comparable to Fresno's original grid pattern in order to increase walkability and improve connections to parks, open space, schools, and neighborhood centers.
- **Goal 9-4:** Make parking convenient and easy to find.

Project Impacts

Alternative 1

Less than significant impact with mitigation incorporated. Following is a discussion of the consistency of Alternative 1 with the applicable plans and policies.

Transportation Plans

Regional Transportation Plan

The Project was included in the regional emissions analysis conducted by Fresno COG for the conforming 2011 Regional Transportation Plan (2011 RTP), under the RTP ID FRE500768, as identified in the 2011 RTP Amendment #2. The description of RTP ID FRE500768 in the RTP projects list is:

1. In the City of Fresno, at 4 locations; reintroduce 2-lane undivided complete streets.
   1) Fulton Mall between Tuolumne and Inyo Streets
   2) Merced Mall from Congo Alley to Federal Alley
   3) Mariposa Mall from Broadway Street to Federal Alley
   4) Kern Mall from Fulton Mall to Federal Alley

FHWA determined the 2011 RTP conforms to the SIP on December 14, 2010. This analysis found that the 2011 RTP and, therefore, the individual projects contained in the 2011 RTP, are conforming projects, and will have air quality impacts consistent with those identified in the state implementation plans for achieving the NAAQS.

The 2011 RTP Amendment #2 was adopted by Fresno COG and the 2011 RTP Amendment #2 conformity was approved by FHWA on December 14, 2012. The Project's design concept and scope have not changed significantly from what was analyzed in the 2011 RTP Amendment #2. Therefore, the Project is consistent with Amendment #2 of the 2011 RTP.

Federal Statewide Transportation Improvement Plan

The FHWA and FTA completed review of California's 2013 FSTIP, and approved the document as proposed. The FHWA and FTA determined the 2013 FSTIP conforms to the SIP on December 14, 2012. Therefore, the proposed project is consistent with the Federal Statewide Transportation Improvement Plan.

Federal Transportation Improvement Plan

The 2013 FSTIP incorporated by reference those projects included in the 2012/2013 Federal Transportation Improvement Programs (FTIP) adopted by the MPOs in California. This conformity determination includes Fresno COG 2013 FTIP Amendment #1, which lists the project. Therefore, the proposed project is consistent with the Federal Transportation Improvement Plan.

City of Fresno 2025 General Plan

The proposed project has been evaluated for its consistency with the 2025 General Plan goals and policies because the 2025 General Plan is the currently adopted plan for the City. Alternatives 1 and 2 propose to reclassify the rights-of-way within Fulton Mall between Tuolumne Street and Inyo Street to a Collector street. This reclassification is not consistent with Policy E-1-a of the Public Facilities Element because this policy makes reference to the 2025 General Plan Circulation Element Map which does not identify the rights-of-way within Fulton Mall as a major street.

Policy E-1-f discusses the LOS D policy for roadways. The implementation of Alternatives 1 and 2 will result in the redistribution of existing traffic. Under the existing plus project scenario, the surrounding intersections would operate at LOS D or better after the redistribution of existing traffic volumes. In the existing plus project plus cumulative scenario, there will be two intersections where the project would contribute to an exceedance of the LOS D policy in the year 2035. Both Alternatives 1 and 2 would not be consistent with Policy E-1-f under cumulative 2035 conditions.

Policy E-2-h includes the limitation of driveway access points on all major streets. The Fulton Mall rights-of-way are not designated as a major street on the City's Circulation Element Map. However, the proposed project would result in the re-classification of the Fulton Mall as a Collector street. Alternatives 1 and 2 does not include the addition of driveway access points on the proposed streets, and therefore, both of these alternatives would be consistent with Policy E-2-h.

City of Fresno 2035 draft General Plan Update

The proposed project has been evaluated for its consistency with the draft General Plan Update goals and policies because this plan is anticipated to be adopted in 2014. Alternatives 1 and 2 propose to reconstruct Fulton Mall using "complete streets" design concepts, which would be consistent with Policy MT-1-h in the General Plan Update. In addition, both alternatives would be consistent with Policy UF-11, which proposes to revitalize the Fulton Mall.

Central Area Community Plan

The Fulton Mall District Goal included in the Central Area Community Plan identifies retention of Fulton Mall as a multifunctional, primarily pedestrian environment. Both Alternatives 1 and 2 would not be consistent with the key premise of maintaining the mall as a pedestrian-only environment. The Fulton Mall District Goal also includes improvement of its physical condition and economic vitality. The implementation of Alternatives 1 and 2 would indirectly increase the economic productivity of Fulton Mall, and therefore, would be consistent with this portion of the Goal. Alternatives 1 and 2 would improve vehicular circulation around and access within the Fulton Mall District, and as a result would be consistent with Fulton Mall District Policy 1. Both alternatives would also result in long-term improvement in the aesthetic appearance by removing the dirty, stained, and cracked pavement, the cracked and stained planters, and the inoperable fountains. The alternatives would include new pavement for the sidewalks, refurbish the sculptures, and provide new lighting systems. The improvements under Alternatives 1 and 2 would improve the appearance of the Fulton Mall area and be consistent with Fulton Mall District Policy 4.

Alternatives 1 and 2 would provide streets that would increase access to the area. This increase in access is anticipated to influence growth within the Fulton Mall District. This growth is anticipated to

occur through the reoccupation of the ground floors of existing vacant buildings as vehicle access and parking become available. As a result, both alternatives would stimulate activity along the Fulton Mall network and would be consistent with Fulton Mall District Policy 5.

The enhancement of security, public convenience, easy access and orientation that are identified in Fulton Mall District Policy 6 are desired elements in the implementation of Alternatives 1 and 2. The provision of streets under both alternatives would increase access and convenience to shop within Fulton Mall. The streets would also allow motorists improved orientation to specific destinations within Fulton Mall. Therefore, Alternatives 1 and 2 would be consistent with Fulton Mall Policy 6.

Fulton Mall District Policy 8 identifies the retention of Fulton Mall as an exciting, physically, and visually superior pedestrian environment. The introduction of streets under Alternatives 1 and 2 would result in a shared environment between pedestrians and motorists. As a result, Alternatives 1 and 2 would not be consistent with Fulton Mall District Policy 8.

Draft Downtown Neighborhood Communities Plan

The proposed project has been evaluated for its consistency with the draft DNCP goals and policies because the City anticipates adopting the DNCP in 2014. There are various goals and policies of the DNCP that are relevant to the proposed project. The DNCP identifies the creation of "complete streets" in Goal 3.3 and Policy 3.3.1. Alternatives 1 and 2 include the reconstruction of Fulton Mall using "complete streets," and therefore, these alternatives would be consistent with the goal and policy. In addition, the DNCP includes policies to prioritize space for pedestrians in the improvement of the public right-of-way (Policy 3.3.6) and decrease conflicts between automobiles and pedestrians by minimizing new curb cuts and driveways (Policy 3.3.8). Alternatives 1 and 2 would be consistent with both of these policies because these alternatives will include sidewalks for pedestrians and no new curb cuts or driveways are proposed. Therefore, Alternatives 1 and 2 would be consistent with Policy 3.3.6 and Policy 3.3.8. The DNCP also has a goal and policy related to enhancing safety and quality of life and reestablishing an interconnected street grid comparable to Fresno's original grid pattern. Both Alternative 1 and 2 would include sidewalks and curbs so vehicular and bicycle traffic is separated from pedestrian traffic. In addition, both alternatives include new streets along Fulton Mall, Kern Mall, Mariposa Mall, and Merced Mall and would reestablish the original street grid. Therefore, both alternatives would be consistent with Goal 3.4 and Policy 3.4.3.

Draft Fulton Corridor Specific Plan

There are also various goals and policies of the draft FCSP that are relevant to the proposed project. The FCSP identifies the provision of a transportation, circulation, and parking system that improves the quality of life in Downtown in Goal 9-1. Both Alternatives 1 and 2 would provide streets within Fulton Mall and increase the number of shoppers within the Mall. The increase in shoppers will increase the number of "eyes" within the Mall and deter crime-related activities, and therefore, improve the quality of life in the Mall. Both alternatives would be consistent with Goal 9-1. The DNCP also includes the provision of pedestrian-oriented streetscapes (Policy 9-1-2), minimization of driveways and driveway crossing (Policy 9-1-4), and installation of on-street parking. Alternatives 1 and 2 are consistent with these policies because both alternatives provide streetscapes that include trees, benches, sculptures and other artwork within the sidewalk areas. In addition, both alternatives do not include any driveways or driveway crossings. Furthermore, both alternatives

include on-street parking to allow shoppers to park near their retail store destination. The FCSP also includes a similar policy as the DNCP related to the reestablishment of an interconnected street grid (Policy 9-1-12). Both Alternatives 1 and 2 will be consistent with Policy 9-1-12). Finally, the FCSP includes a goal (Goal 9-4) to make parking more convenient and easy to find. The provision of on-street parking adjacent to the retail stores will make parking easier to find. Therefore, both alternatives would be consistent with Goal 9-4.

Alternatives 1 and 2 would be consistent with the various transportation plans, as well as the goals and policies of the City of Fresno draft 2035 General Plan Update, the draft DNCP, and the draft FCSP. Alternatives 1 and 2 would not be consistent with elements of the 2025 General Plan and Central Area Community Plan. Narrative changes, as specified below, would be required mitigation measures.

Mitigation Measures

2025 General Plan

MM LU-1 Policy E-1-a: An amendment to the Circulation Element Map would be required to reclassify the rights-of-way within Fulton Mall between Tuolumne Street and Inyo Street to a Collector street.

MM LU-2 Policy E-1-f: Mitigation identified in the Supplemental Traffic Impact Report would be implemented to improve the intersections so that the project's contribution to the exceedance of LOS D at two intersections would be reduced.

Central Area Community Plan

MM LU-3 Fulton Mall District Goal: An amendment to the Circulation Element Map of the 2025 General Plan would be required for Alternatives 1 and 2 to reclassify the Fulton Mall from a pedestrian-oriented facility to a collector street.

MM LU-4 Fulton Mall District Policy 8: Narrative changes to the Plan would need to be provided to re-classify the Mall from a pedestrian-only environment to a collector street. The No Build Alternative (Alternative 3) would result in no adverse impacts to transportation and land use plans. No avoidance, minimization, or mitigation measures are required as part of the No Build Alternative.

Implementation of the above mitigation measures would reduce the potential impacts on existing plans and policies by Alternative 1 to less than significant

.Alternative 2

Less than significant with mitigation incorporated. The determination of less than significant with mitigation incorporated described above for Alternative 1 would be the same for Alternative 2.

Mitigation Measures

Implementation of Mitigation Measures LU-1 through LU-4 are required.

Implementation of the above mitigation measures would reduce the potential impacts on existing plans and policies by Alternative 2 to less than significant.

Cumulative Impacts

Less than significant with mitigation incorporated. Implementation of Alternative 1 or 2 may contribute to cumulative impacts on plans and policies. This contribution is considered to be cumulatively significant.

Mitigation Measures

Implementation of Mitigation Measures LU-1 through LU-4 are required.

Implementation of the above mitigation measures would reduce the contribution of potential impacts on existing plans and policies by Alternative 1 or 2 to less than significant.

Conflict with Conservation Plans

c) Conflict with any applicable habitat conservation plan or natural communities conservation plan?

According to the California Department of Fish and Wildlife, the project site is not located within the boundaries of a natural communities conservation plan and according to the California Land Use Planning and Information Network, the project site is not located within the boundaries of a habitat conservation plan.

Project Impacts

Alternative 1

No impact. Since Fulton Mall is not mapped as occurring with any adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan, the implementation of Alternative 1 would not conflict with provisions of any adopted local, state or federal Natural Community Conservation Plan or Habitat Conservation Plan.

Alternative 2

No impact. The determination of no potential impact to an adopted Habitat Conservation Plan or Natural Community Conservation Plan as described above under Alternative 1 would be the same for Alternative 2.

Cumulative Impacts

No impact. Since Fulton Mall is not an area designated within a Habitat Conservation Plan or Natural Community Conservation Plan, the development of Alternative 1 or 2 would result in no cumulative impacts.

3.11 - Mineral Resources

Loss of Known Mineral Resource

a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?

Project Impacts

Alternative 1

No impact. Aggregate materials along the San Joaquin River corridor are the principal mineral resources in Fresno; additional resources are located along the Kings River corridor and several streambeds in the western portion of Fresno County. Resources are surface mined. The California Department of Conservation, Division of Mines and Geology, maps aggregate deposits and has designated the Fresno Metropolitan Area and most of eastern Fresno County as a production-consumption region for mineral resources (Fresno General Plan Draft MEIR, 2002). However, the Project site and immediate vicinity are not mapped on the most recent Aggregate Mineral Resource Zones Map in the City's planning area (Fresno General Plan [Exhibit 10], 2002). Therefore, no impact on mineral resources would occur.

Alternative 2

No impact. The determination of no potential impact for the loss of availability of mineral resources described for Alternative 1 would be the same for Alternative 1.

Cumulative Impacts

No impact. Implementation of the project would not contribute to cumulative effects on mineral resources.

Loss of Mineral Resource Recovery Site

b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?

Project Impacts

Alternative 1

No impact. Aggregate materials along the San Joaquin River corridor are the principal mineral resources in Fresno; additional resources are located along the Kings River corridor and several streambeds in the western portion of Fresno County. Resources are surface mined. The California Department of Conservation, Division of Mines and Geology, maps aggregate deposits and has designated the Fresno Metropolitan Area and most of eastern Fresno County as a production-consumption region for mineral resources (Fresno General Plan Draft MEIR, 2002). However, the Project site and immediate vicinity are not mapped on the most recent Aggregate Mineral Resource Zones Map in the City's planning area (Fresno General Plan [Exhibit 10], 2002). Therefore, no impact on mineral resources would occur.

Alternative 2

No impact. The determination of no potential impact for project implementation to result in the loss of availability of mineral resources described in Alternative 1 would be the same for Alternative 2.

Cumulative Impacts

No impact. Implementation of the project would not contribute to cumulative effects on mineral resources.

3.12 - Noise

The following is a summary of the Noise Study Report prepared for the proposed project by FirstCarbon Solutions in September 2013. The complete report is provided in Appendix I. Noise is defined as unwanted sound. Sound becomes unwanted when it interferes with normal activities, when it causes actual physical harm or when it has adverse effects on health. Sound is produced by the vibration of sound pressure waves in the air. Sound pressure levels are used to measure the intensity of sound and are described in terms of decibels. The decibel (dB) is a logarithmic unit, which expresses the ratio of the sound pressure level being measured to a standard reference level. A-weighted decibels (dBA) approximate the subjective response of the human ear to a broad frequency noise source by discriminating against very low and very high frequencies of the audible spectrum. They are adjusted to reflect only those frequencies that are audible to the human ear.

Noise equivalent sound levels are not measured directly, but are calculated from sound pressure levels typically measured in dBA. The equivalent sound level (L_{eq}) represents a steady state sound level containing the same total energy as a time varying signal over a given sample period. The peak traffic hour L_{eq} is the noise metric used by California Department of Transportation (Caltrans) for all traffic noise impact analyses.

The Day-Night Average Sound Level (L_{dn}) is the weighted average of the intensity of a sound, with corrections for time of day, and averaged over 24 hours. The time of day corrections require the addition of ten decibels to sound levels at night between 10 p.m. and 7 a.m. While the Community Noise Equivalent Level (CNEL) is similar to the L_{dn}, except that it has another addition of 4.77 dB to sound levels during the evening hours between 7 p.m. and 10 p.m. These additions are made to the sound levels at these times because during the evening and nighttime hours, when compared to daytime hours, there is a decrease in the ambient noise levels, which creates an increased sensitivity to sounds. For this reason the sound is perceived to be louder in the evening and nighttime hours and is weighted accordingly. Many cities rely on the CNEL noise standard to assess transportation-related impacts on noise sensitive land uses.

Noise measurements were taken to represent existing ambient noise levels at land uses that may be affected by the conversion of the existing pedestrian only streets into complete streets, thereby allowing vehicle access.

As shown in Figure 5-1 (see appendix), Noise Measurement 1 (NM1) was taken at the intersection of two streets that currently allow vehicle access (Broadway Street and Fresno Street). Further, the intersection of Highway 99 and Fresno Street is approximately 2,375 feet to the west of this location.

There is also bus service along Fresno Street. Noise Measurements 2 and 5 were taken internal to the project site where vehicle access is currently not allowed. Noise Measurement 3 was taken near Van Ness Avenue near Kern Street that currently does not allow vehicle access. Measurement 4 was taken at the western corner of the intersection of Tuolumne Street and Fulton Street, where Fulton Street dead ends into the mall and becomes "Fulton Mall." Table 17 summarizes the results of the short-term noise monitoring conducted in the study area.

Table 17: Summary of Short-Term Measurements

Position	Land Uses	Start Time	Duration (minutes)	Measured L_{eq}
NM-1	Residential (Masten Towers)	6:24 p.m.	15	70.7
NM-2	Residential (Pacific Southwest Building) and Retail	4:30 p.m.	30	59.9
NM-3	Residential (Californian Hotel)	5:58 p.m.	15	65.7
NM-4	Office/Commercial	6:51 p.m.	15	62.5
NM-5	Office Commercial	5:09 p.m.	30	59.9

Following is the noise evaluation for each of the CEQA Checklist items.

Noise Levels in Excess of Standards

a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Federal Regulations

The adverse impact of noise was officially recognized by the federal government in the Noise Control Act of 1972, which serves the three purposes listed below:

- Promulgating noise emission standards for interstate commerce.
- Assisting state and local abatement efforts.
- Promoting noise education and research.

The Federal Office of Noise Abatement and Control was initially tasked with implementing the Noise Control Act. However, the ONAC has since been eliminated, leaving the development of federal noise policies and programs to other federal agencies and interagency committees. For example, the Occupational Safety and Health Administration (OSHA) agency limits noise exposure of workers to 90 dB L_{eq} or less for 8 continuous hours or 105 dB L_{eq} or less for 1 continuous hour.

The Department of Transportation (DOT) assumed a significant role in noise control through its various operating agencies. The Federal Aviation Administration (FAA) regulates noise of aircraft and airports. Surface transportation system noise is regulated by a host of agencies, including the Federal Transit Administration (FTA). Transit noise is regulated by the federal Urban Mass Transit Administration, while freeways that are part of the interstate highway system are regulated by the

Federal Highway Administration (FHWA). Finally, the federal government actively advocates that local jurisdictions use their land use regulatory authority to arrange new development in such a way that "noise sensitive" uses are either prohibited from being sited adjacent to a highway or, alternately that the developments are planned and constructed in such a manner that potential noise impacts are minimized.

Since the federal government has preempted the setting of standards for noise levels that can be emitted by the transportation sources, the City of Fresno is restricted to regulating the noise generated by the transportation system through nuisance abatement ordinances and land use planning.

State Regulations

Established in 1973, the California Department of Health Services Office of Noise Control was instrumental in developing regularity tools to control and abate noise for use by local agencies. One significant model is the "Land Use Compatibility for Community Noise Environments Matrix," which allows the local jurisdiction to delineate compatibility of sensitive uses with various incremental levels of noise (California Department of Health, Office of Noise Control 1976).

Title 24, Chapter 1, Article 4 of the California Administrative Code (California Noise Insulation Standards) requires noise insulation in new hotels, motels, apartment houses, and dwellings (other than single-family detached housing) that provides an annual average noise level of no more than 45 dBA CNEL. When such structures are located within a 60-dBA CNEL (or greater) exterior noise contour, an acoustical analysis is required to ensure that interior levels do not exceed the 45-dBA CNEL annual threshold. In addition, Title 21, Chapter 6, Article 1 of the California Administrative Code requires that all habitable rooms, hospitals, convalescent homes, and places of worship shall have an interior CNEL of 45 dB or less due to aircraft noise.

Government Code Section 65302 mandates that the legislative body of each county and city in California adopt a noise element as part of its comprehensive general plan. The local noise element must recognize the land use compatibility guidelines published by the State Department of Health Services. The guidelines rank noise/land use compatibility in terms of normally acceptable, conditionally acceptable, normally unacceptable, and clearly unacceptable. The City of Fresno utilizes a version of these guidelines to evaluate potential noise/land use impacts.

Local Regulations

The City of Fresno is currently in the process of updating their General Plan. Draft versions of the Noise and Safety Element are available for viewing; however, they have not been adopted yet. Therefore, the 2025 Fresno General Plan standards still apply.

The City of Fresno General Plan Noise Element (2002) contains goals and policies that address noise. The following General Plan goals and policies are applicable to the proposed project:

- **Goal 1.** Enhance the quality of life for the citizens of Fresno and plan for the projected population within the moderately expanded Fresno urban boundary in a manner which will respect physical, environmental, fiscal, economic, and social issues.
- **Goal 14.** Protect and improve public health and safety.
- **H-1-a. Policy.** Noise-sensitive land uses impacted by existing or projected future transportation noise sources shall include mitigation measures so that resulting noise levels do not exceed the standards shown in Table 18 below:

Table 18: Maximum Allowable Noise Exposure for Noise Sensitive Land Uses

Land Use[4]	Outdoor Activity Areas[1] L_{dn} dB	Interior Spaces	
		L_{dn} dB	L_{eq} dB[2]
Residential	60[3]	45	—
Transient Lodging	60[3]	45	—
Hospitals, Nursing Homes	60[3]	45	—
Theaters, Auditoriums, Music Halls	—	—	35
Churches, Meeting Halls	60[3]	—	45
Office Buildings	—	—	45
Schools, Libraries, Museums	—	—	45

Notes:
1 Where the location of the outdoor activity area is unknown or is not applicable, the exterior noise level standard shall be applied to the property line of the receiving land use.
2 As determined for a typical worst-case hour during periods of use.
3 Noise levels up to 65 dB L_{dn} adjacent to the Burlington Northern Santa Fe and Union Pacific mainline tracks may be allowed by the project approving authority when it is determined that it is not possible to achieve 60 dB L_{dn} in outdoor activity areas using a practical application of the best-available noise reduction technology, and when all feasible exterior noise reduction measures have been proposed.
4 The Planning and Development Director, on a case-by-case basis, may designate land uses other than those shown in this table to be noise-sensitive, and may require appropriate noise mitigation measures.
Source: City of Fresno General Plan Noise Element, February 2002: 163.

- **H-1-b. Policy.** For purposes of city analyses of noise impacts, and for determining appropriate noise mitigation, a significant increase in ambient noise levels is assumed if the project causes ambient noise levels to exceed the following:
  - The ambient noise level is less than 60 dB L_{dn} and the project increase noise levels by 5 dB or more.
  - The ambient noise level is 60-65 dB L_{dn} and the project increases noise levels by 3 dB or more
  - The ambient noise level is greater than 65 dB L_{dn} and the project increases noise levels by 1.5 dB or more.
- **H-1-c. Policy.** The city shall review new public and private development proposals to determine conformance with the policies of this Noise Element.

- **H-1-d. Policy.** The city shall require an acoustical analysis in those cases where a project potentially threatens to expose existing or proposed noise-sensitive land uses to excessive noise levels. The presumption of potentially excessive noise levels shall be based on the location of new noise-sensitive uses to known noise sources of staff's professional judgment that a potential for adverse noise impacts exists. Acoustical analyses shall be required early in the review process so that noise mitigation may be included in the project design. For development not subject to environmental review, the requirements for an acoustical analysis shall be implemented prior to the issuance of building permits. The requirements for the content of an acoustical analysis are established by the Planning and Development Department in conjunction with environmental health agencies.
- **H-1-e. Policy.** The city shall develop and employ procedures to ensure that noise mitigation measures required pursuant to an acoustical analysis are implemented in the development review and building permit processes.
- **H-1-f. Policy.** The city shall develop and employ procedures to monitor compliance with the policies of the Noise Element after completion of projects where noise mitigation measures have been required.
- **H-1-g. Policy.** The city shall enforce the State Noise Insulation Standards (California Code of Regulations, Title 24) and Chapter 35 of the Unicom Building Code (UBC) concerning interior noise exposure for multi-family housing, hotels and motels.
- **H-1-h. Policy.** The city shall request the California Highway Patrol, the Sheriffs, and Police Department to actively enforce the California Vehicle Code sections relating to adequate vehicle mufflers and modified exhaust systems, and sound systems in vehicles.
- **H-1-i. Policy.** The city shall review and update the Noise Element and the Noise Ordinance to ensure that noise exposure information and specific policies and ordinances are consistent with changing conditions with the city and with noise control regulations or policies enacted after the adoption of this element.
- **H-1-j Policy.** Noise created by new transportation noise sources, including roadway improvement projects, shall be mitigated so that resulting noise levels do not exceed the adopted standards at noise-sensitive land uses.
- **H-1-k. Policy.** Noise-sensitive land uses impacted by stationary noise sources shall include mitigation measures so that resulting noise levels do not exceed the standards shown in Table 19:

Table 19: Maximum Allowable Noise Exposure-Stationary Noise Sources1

Noise Descriptor	Daytime (7 a.m. to 10 p.m.)	Nighttime (10 p.m. to 7 a.m.)
Hourly Equivalent Sound Level (L_{eq}), dB	50	45
Maximum Sound Level (L_{max}), dB	70	65

Notes:
[1] As determined at the outdoor activity areas. Where the location of outdoor activity areas is unknown or not applicable, the noise exposure standard shall be applied at the property line of the receiving land use. When ambient noise levels exceed or equal the levels in this table, mitigation shall only be required to limit noise to the ambient plus five (5) dB.
Source: City of Fresno General Plan Noise Element, Table 9. February 2002

- **H-1-l. Policy.** Noise created by new proposed stationary noise sources or existing stationary noise sources which undergo modifications that may increase noise levels shall be mitigated so as not to exceed the noise level standards of Table 19 at noise-sensitive land uses.
- **H-1-m Policy.** As a guideline, noise barrier (wall, earth berms, or berm/wall combinations) shall not exceed 15 feet in height as measured from the elevation of the nearest building pad. The Planning Department Director, on a case-by-case basis, may allow noise barrier heights differing from this guideline. However, resulting noise levels must satisfy the maximum allowable noise exposure standards.

City of Fresno Municipal Code

Chapter 10, Regulations Regarding Public Nuisances and Real Property Conduct and Use, Article 1, Noise Regulations, of the Fresno Municipal Code establishes excessive noise guidelines and exemptions. The following portions of the Municipal Code are applicable to the proposed project:

- SEC. 10-102. - Definitions.
  (b) Ambient Noise. "Ambient noise" is the all-encompassing noise associated with a given environment, being usually a composite of sounds from many sources near and far. For the purpose of this ordinance, ambient noise level is the level obtained when the noise level is averaged over a period of fifteen minutes, without inclusion of the offending noise, at the location and time of day at which a comparison with the offending noise is to be made. Where the ambient noise level is less than that designated in this section, however, the noise level specified herein shall be deemed to be the ambient noise level for that location.

Table 20: SEC. 10-102 of the Noise Ordinance of the City of Fresno

District	Time	Sound Level Decibels
Residential	10 pm to 7 am	50
Residential	7 pm to 10 pm	55
Residential	7 am to 7 pm	60
Commercial	10 pm to 7 am	60
Commercial	7 am to 10 pm	65
Industrial	anytime	70

- SEC. 10-105. Excessive Noise Prohibited. No person shall make, cause, or suffer or permit to be made or caused upon any premises or upon any public street, alley, or place within the city, any sound or noise which causes discomfort or annoyance to any reasonable person of normal sensitiveness residing or working in the area, unless such noise or sound is specifically authorized by or in accordance with this article. The provisions of this section shall apply to, but shall be limited to, the control, use, and operation of the following noise sources:
  (a) Radios, musical instruments, phonographs, television sets, or other machines or devices used for the amplification, production, or reproduction of sound or the human voice.
  (b) Animals or fowl creating, generating, or emitting any cry or behavioral sound.
  (c) Machinery or equipment, such as fans, pumps, air conditioning units, engines, turbines, compressors, generators, motors or similar devices, equipment, or apparatus.
  (d) Construction equipment or work, including the operation, use or employment of pile drivers, hammers, saws, drills, derricks, hoists, or similar construction equipment or tools. This subsection shall not apply to construction equipment or work within the area bounded by the Union Pacific tracks, from Ventura to Tulare; Tulare Street, from Union Pacific tracks to Fulton Mall; Fulton Mall/Street, from Tulare to Ventura; and Ventura Street, from Fulton Street to Union Pacific tracks. This exception shall become null and void on June 1, 2003. (Orig. Ord. 1076; Rep. and Added Ord. 72-163, 1972; Am. Ord. 2001-41, § 1, 5-20-01).

- SEC. 10-107 School, Hospitals, and Churches. No person shall create any noise on any street, sidewalk, or public place adjacent to any school, institution of learning, or church while the same is in use, or adjacent to any hospital, which noise unreasonably interferes with the workings of such institution or which disturbs or unduly annoys patients in the hospital, provided conspicuous signs are displayed in such street, sidewalk, or public place indicating the presence of a school, church, or hospital. (Orig. Ord. 3667; Rep. and Added Ord. 72-163, 1972).
- SEC. 10-109 Exceptions. The provisions of this article shall not apply to:
  (a) Construction, repair or remodeling work accomplished pursuant to a building, electrical, plumbing, mechanical, or other construction permit issued by the city or other governmental agency, or to site preparation and grading, provided such work takes place between the hours of 7:00 a.m. and 10:00 p.m. on any day except Sunday.

(b) Emergency work.
(c) Any act or acts which are prohibited by any law of the State of California or the United States. (Added Ord. 72-163, 1972; Am. Ord. 80-171, § 74, eff. 12-26-80).

Project Impacts

Alternative 1

Less Than Significant Impact. The implementation of Alternative 1 would result in increases in noise levels during construction and operational activities.

Construction

Construction noise varies depending on the construction process, type of equipment involved, location of the construction site with respect to sensitive receptors, the schedule proposed to carry out each task (e.g., hours and days of the week) and the duration of the construction work.

Table 21 summarizes noise levels produced by construction equipment that is commonly used on roadway construction projects. Construction equipment is expected to generate noise levels ranging from 70 to 90 dB at a distance of 50 feet, and noise produced by construction equipment would be reduced over distance at a rate of about 6 dB per doubling of distance.

Table 21: Construction Equipment Noise

Equipment	Maximum Noise Level (dBA at 50 feet)
Scrapers	89
Bulldozers	85
Heavy Trucks	88
Backhoe	80
Pneumatic Tools	85
Concrete Pump	82
Source: Federal Transit Administration 1995.	

Construction equipment used on the site may be mobile or stationary. Mobile equipment (e.g., loaders, graders, dozers) moves around a construction site performing tasks in a recurring manner. Stationary equipment (e.g., air compressor, generator, concrete saw) operates in a given location for an extended period of time to perform continuous or periodic operations. Operational characteristics of heavy construction equipment are additionally typified by short periods of full power operation followed by extended periods of operation at lower power, idling, or powered-off conditions.

Site preparation involves demolition, grading, compacting, and excavating. Equipment and vehicles that may be used during site preparation would include backhoes, bulldozers, loaders, excavation equipment (e.g., graders and scrapers), pile drivers and compaction equipment. Finishing activities may include the use of pneumatic hand tools, scrapers, concrete trucks, vibrators, and haul trucks.

During construction of the project, noise from construction activities may intermittently dominate the noise environment in the immediate area of construction. Construction noise is required to comply with applicable local, state, and federal regulations, and that all equipment shall be fitted with adequate mufflers according to the manufacturers' specifications.

No adverse noise impacts from construction are anticipated because the use of construction vehicles would only occur between the hours of 7:00 a.m. and 10:00 p.m. Monday through Saturdays and therefore, be exempt from the City of Fresno Noise Ordinance standards.

Operation
Potential noise impacts associated with the operations of the proposed project are a result of project-generated vehicular traffic on the project vicinity roadways and from stationary noise sources associated with the proposed project.

According to the traffic study prepared for the proposed project (Fehr & Peers 2013), the addition of roadways within Fulton Mall would not result in an increase of greater than 0.03 percent over baseline on any road segment with the exception of Fulton Street. Considering that a doubling of the existing traffic volumes would be required to achieve a 3 dB increase in ambient noise levels, implementation of the proposed project would result in a nominal increase in ambient noise levels along study area road segments. According to the City of Fresno 2025 General Plan, a threshold of significance for increases in ambient noise levels is a 5 dB or more. Therefore, impacts to these road segments are less than significant and not discussed further in this analysis. The impact analysis will be focused on the pedestrian-only right-of-way segments that are proposed to be converted to "complete streets."

Alternative 1 would result in 210 ADT on Fulton Street between Tuolumne Street and Inyo Street at project completion. None of the other road segments that will be converted from pedestrian use are through streets and would only service the immediate area. Therefore, traffic volumes along these segments would be less than those projected for Fulton Street. Considering this, traffic noise modeling was only conducted for Fulton Street, as it represents the worst-case scenario.

Under Baseline Plus Project for Alternative 1, vehicle traffic noise along Fulton Street was modeled, and traffic noise levels would reach up to 42.5 dBA L_{eq} (h) and 42.7 dBA CNEL at the buildings adjacent to the Fulton Street rights-of-way. Existing ambient noise levels (59.9-70.7 dBA L_{eq}) are substantially louder than the projected Baseline Plus Project noise levels. Therefore, the implementation of Alternative 1 would result in a less than significant traffic noise impact because the City of Fresno's noise standard of 60 dBA CNEL for sensitive uses such as residences would not be exceeded.

Parking Areas
Sources of noise from parking areas are primarily from engine and tire noise, slamming of doors, and pedestrians. A parking area is not considered to be a serene environment and the traffic noise from the adjacent streets will provide a masking effect over the short-term, single event noise occurrences common to parking lots. Therefore, less than significant noise impacts would occur from the proposed parking areas along the proposed streets.

Tot Lot Area

The Fulton Mall includes two tot lots—one near the corner of Fulton and Merced, the other near Fulton and Kern—that were part of the Mall's original design. In 2008, the City of Fresno used funding from State Proposition 40 and the Federal Land and Water Conservation Fund (LWCF) to improve these tot lots. The City removed the original play structures, which were in extreme disrepair, and installed new, brightly colored play equipment and a soft-fall surface in a portion of each tot lot area.

The proposed Fulton Mall Reconstruction Project involves the reintroduction of a roadway in the right-of-way on Fulton and its cross-malls, and it will not be possible to retain the Mall's tot lots in their present locations. The tot lot would be relocated to an area adjacent to Congo Alley and approximately 72 feet from the right-of-way (ROW) of Mariposa Mall (Street). The traffic noise impact to the relocated tot lot is expected to be less than 60 dBA. Mariposa Street would have less traffic volume than Fulton Street, and Fulton Street was shown to have a maximum cumulative noise level of 53.1 dBA CNEL at the building facade adjacent to the roadway. The relocated tot lot will be an additional 72 feet back from the road ROW, which would reduce noise levels further. Traffic noise impacts to the relocated tot lot would be less than significant.

Mitigation Measures

Although construction impacts would be less than significant, Mitigation Measures NOI-1 through NOI-4 are recommended to ensure construction noise is minimized.

MM NOI 1 The construction contractor shall locate equipment staging in areas that will create the greatest distance between construction-related noise sources and residential uses nearest the project site during all project construction.

MM NOI 2 The construction contractor shall place all stationary construction equipment so that emitted noise is directed away from the noise sensitive receptors nearest the project site, to the degree possible.

MM NOI 3 The project proponent shall mandate that the construction contractor prohibit the use of personal or commercial music or sound amplification on the project site during construction.

MM NOI 4 The construction contractor shall limit haul truck deliveries to the same hours specified for construction equipment. To the extent feasible, haul routes shall not pass sensitive land uses or residential dwellings.

Alternative 2

Less than significant impact. The implementation of Alternative 2 would result in increases in noise levels during construction and operational activities.

The determination of less than significant construction noise impacts to persons exposed to or generation of noise levels in excess of existing standards under Alternative 2 would be the same as described above for Alternative 1.

Similar to the discussion provided under Alternative 1, the addition of roadways within Fulton Mall under Alternative 2 would not result in an increase of greater than 0.03 percent over baseline on any road segment with the exception of Fulton Street. Considering that a doubling of the existing traffic volumes would be required to achieve a 3 dB increase in ambient noise levels, implementation of the proposed project would result in a nominal increase in ambient noise levels along study area road segments. According to the City of Fresno 2025 General Plan, a threshold of significance for increases in ambient noise levels is a 5 dB or more. Therefore, impacts to these road segments are less than significant and not discussed further in this analysis. The impact analysis will be focused on the pedestrian-only right-of-way segments that are proposed to be converted to "complete streets."

Similar to Alternative 1, Alternative 2 would result in 210 ADT on Fulton Street between Tuolumne Street and Inyo Street at project completion. None of the other road segments that will be converted from pedestrian use are through streets and would only service the immediate area. Therefore, traffic volumes along these segments would be less than those projected for Fulton Street. Considering this, traffic noise modeling was only conducted for Fulton Street, as it represents the worst-case scenario.

Under Baseline Plus Project for Alternative 2, vehicle traffic noise along Fulton Street was modeled for areas within the vignettes and areas outside of the vignettes. The modeling is different because speed limits would change from 25 miles per hour inside the vignettes to 30 miles per hour outside the vignettes. The traffic noise levels would reach up to 40.5 dBA L_{eq} (h) and 40.7 dBA CNEL at the buildings adjacent to the Fulton Street rights-of-way within the vignette areas and up to 42.5 dBA L_{eq} (h) and 42.7 dBA CNEL at the buildings adjacent to the Fulton Street rights-of-way outside of the vignette areas. Existing ambient noise levels (59.9-70.7 dBA L_{eq}) are substantially louder than the projected Baseline Plus Project noise levels. Therefore, the implementation of Alternative 2 would result in a less than significant traffic noise impact because the City of Fresno's noise standard of 60 dBA CNEL for sensitive uses such as residences would not be exceeded within or outside of the vignette areas. Therefore, long-term traffic noise impacts would be less than significant.

The determination of less than significant impacts from parking areas as well as to the proposed tot lots as described above for Alternative 1 would be the same for Alternative 2.

Mitigation Measures

Although construction impacts would be less than significant, Mitigation Measures NOI-1 through NOI-4 are recommended to ensure construction noise is minimized.

MM NOI 1 The construction contractor shall locate equipment staging in areas that will create the greatest distance between construction-related noise sources and residential uses nearest the project site during all project construction.

MM NOI 2 The construction contractor shall place all stationary construction equipment so that emitted noise is directed away from the noise sensitive receptors nearest the project site, to the degree possible.

MM NOI 3 The project proponent shall mandate that the construction contractor prohibit the use of personal or commercial music or sound amplification on the project site during construction.

MM NOI 4 The construction contractor shall limit haul truck deliveries to the same hours specified for construction equipment. To the extent feasible, haul routes shall not pass sensitive land uses or residential dwellings.

Cumulative Impacts

Less than significant impact. Cumulative development within Downtown Fresno will increase construction and operational noise levels.

There is a possibility that construction activities associated with cumulative development could occur in Downtown Fresno at the same time as the construction of Alternative 1 or 2. Construction equipment is expected to generate noise levels ranging from 70 to 90 dB at a distance of 50 feet, and noise produced by construction equipment would be reduced over distance at a rate of about 6 dB per doubling of distance.

During construction of cumulative projects, noise from construction activities may intermittently dominate the noise environment in the immediate area of construction. Construction noise is required to comply with applicable local, state, and federal regulations, and that all equipment shall be fitted with adequate mufflers according to the manufacturers' specifications.

No adverse noise impacts from cumulative construction are anticipated because the use of construction vehicles are expected to occur between the hours of 7:00 a.m. and 10:00 p.m. Monday through Saturdays and therefore, be exempt from the City of Fresno Noise Ordinance standards. As a result, cumulative construction noise would be less than cumulatively significant.

Potential noise impacts associated with the operations of the proposed project are a result of project-generated vehicular traffic on the project vicinity roadways and from stationary noise sources associated with the proposed project.

The Noise Study Report evaluated cumulative traffic noise levels. The analysis focused on Fulton Street because all other roadways would experience a nominal increase in traffic with the implementation of Alternatives 1 or 2.

Under Alternatives 1 or 2, cumulative traffic levels along Fulton Street from Tuolumne Street to Inyo Street would be 2,310 ADT. None of the other road segments that will be converted from pedestrian use are through streets and would only service the immediate area. Therefore, the project contribution to cumulative traffic volumes along these segments would be less than the project's contribution projected for Fulton Street. Considering this, cumulative traffic noise modeling was only conducted for Fulton Street, as it represents the worst-case scenario.

Under Cumulative Plus Project for Alternative 1, vehicle traffic noise along Fulton Street was modeled, and traffic noise levels would reach up to 52.9 dBA L_{eq} (h) and 53.1 dBA CNEL at the

buildings adjacent to the Fulton Street rights-of-way. Under Cumulative Plus Project for Alternative 2, vehicle traffic noise along Fulton Street was modeled, and traffic noise levels would be the same as Alternative 1 for areas outside the vignette areas and reach up to 50.9 dBA L_{eq} (h) and 51.1 dBA CNEL at the buildings adjacent to the Fulton Street rights-of-way in areas within the vignettes. Existing ambient noise levels (59.9-70.7 dBA L_{eq}) are substantially louder than the projected Cumulative Plus Project noise levels. Therefore, cumulative noise levels under Alternative 1 or 2 would result in a less than significant cumulative traffic noise impact because the City of Fresno's noise standard of 60 dBA CNEL for sensitive uses such as residences would not be exceeded. Therefore, long-term cumulative traffic noise impacts would be less than significant.

The determination of less than significant cumulative noise impacts from parking areas as well as to the proposed tot lots as described above for Alternative 1 project impacts would be the same for cumulative impacts.

Mitigation Measures

Although construction impacts would be less than significant, Mitigation Measures NOI-1 through NOI-4 are recommended to ensure the project's contribution to potential cumulative construction noise is minimized.

MM NOI 1 The construction contractor shall locate equipment staging in areas that will create the greatest distance between construction-related noise sources and residential uses nearest the project site during all project construction.

MM NOI 2 The construction contractor shall place all stationary construction equipment so that emitted noise is directed away from the noise sensitive receptors nearest the project site, to the degree possible.

MM NOI 3 The project proponent shall mandate that the construction contractor prohibit the use of personal or commercial music or sound amplification on the project site during construction.

MM NOI 4 The construction contractor shall limit haul truck deliveries to the same hours specified for construction equipment. To the extent feasible, haul routes shall not pass sensitive land uses or residential dwellings.

Excessive Groundborne Vibration

b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

The Federal Transit Administration Report2 outlines guidelines for assessing the impact of vibration from construction activities on nearby buildings. The guidelines determine impact threshold levels that should be considered based on the age and/or condition of the structures and the level of vibration that could potentially cause damage to the structural integrity of those structures. Based

[2] U.S. Department of Transportation, Federal Transit Administration, "Transit Noise and Vibration Impact Assessment," May 2006.

on the age and/or condition of the buildings, the recommended damage thresholds range from 0.2 inches/second peak particle velocity at non-engineered timber and masonry structures to 0.5 inches/second peak particle velocity for reinforced-concrete, steel, or timber structures containing no plaster. Thus, for the purposes of this analysis, the following significance thresholds are applied to analyze the potential vibration impacts from Project construction:

- Project construction activities would cause a ground-borne vibration level to exceed 0.2 inches/second peak particle velocity at non-engineered timber and masonry structures;
- Project construction activities would cause a ground-borne vibration level to exceed 0.3 inches/second peak particle velocity at engineered concrete and masonry (no plaster) buildings;
- Project construction activities would cause a ground-borne vibration level to exceed 0.12 inches/second peak particle velocity at buildings extremely susceptible to vibration damage, such as historic buildings; or
- Project construction activities would cause a ground-borne vibration level to exceed 0.5 inches/second peak particle velocity at reinforced-concrete, steel, or timber (no plaster) structures.

Project Impacts

Alternative 1

Less than significant impact. While long-term project operation would not include uses or activities that typically generate excessive groundborne vibration or groundborne noise levels, short-term project construction could introduce groundborne vibration to the project site and the surrounding area.

Offsite sources that may produce perceptible vibrations are usually caused by construction equipment, steel-wheeled trains, and traffic on rough roads, while smooth roads rarely produce perceptible groundborne noise or vibration (Table 22).

Table 22: Vibration Levels Generated by Construction Equipment

Equipment	Peak Particle Velocity (inches/second) at 25 feet	Approximate Vibration Level (LV) at 25 feet
Pile driver (impact)	1.518 (upper range) 0.644 (typical)	112 104
Pile driver (sonic)	0.734 upper range 0.170 typical	105 93
Clam shovel drop (slurry wall)	0.202	94
Hydromill (slurry wall)	0.008 in soil 0.017 in rock	66 75
Vibratory Roller	0.210	94

Table 22 (cont.): Vibration Levels Generated by Construction Equipment

Equipment	Peak Particle Velocity (inches/second) at 25 feet	Approximate Vibration Level (LV) at 25 feet
Hoe Ram	0.089	87
Large bulldozer	0.089	87
Caisson drill	0.089	87
Loaded trucks	0.076	86
Jackhammer	0.035	79
Small bulldozer	0.003	58
Source: Transit Noise and Vibration Impact Assessment, Federal Transit Administration, May 2006.		

The primary source of vibration during project construction would likely be from a bulldozer (tractor), which would generate 0.089 inch per second PPV at 25 feet with an approximate vibration level of 87 VdB. Vibration from the bulldozer would be intermittent and not a source of continual vibration. At less than 0.1 inch/second, the bulldozer would not create vibration that would affect even the most fragile of structures. Therefore, impacts from construction vibration are considered to be less than significant.

Operation
The proposed project consists of the reconstruction of Fulton Mall as a complete street by reintroducing vehicle traffic lanes to the existing pedestrian mall. The project does not include any sources of operational vibration; no impacts are anticipated.

Alternative 2

Less than significant impact. The determination of less than significant impacts to persons exposed to or generation of excessive groundborne vibration or groundborne noise levels as described above under Alternative 1 would be the same for Alternative 2.

Cumulative Impacts

Less than significant impact. Cumulative development associated with the implementation of the 2025 Fresno General Plan, the CACP or, if adopted, the DNCP and FCSP as well as current development projects in the Downtown Fresno area will result in construction activities that could expose persons to groundborne vibration. Construction of multi-story structures could require the use of pile drivers, which could result in a substantial amount of vibration. Cumulative short-term construction vibration could be significant. Long-term vibration impacts associated with development in Downtown Fresno is expected to be less than significant because the uses that are proposed to be allowed within the DNCP and FCSP are not associated with substantial groundborne vibration.

Construction activities associated with Alternatives 1 or 2 would result in less than significant vibration impacts as discussed above. The project's contribution to potential cumulative impacts are

considered less than cumulatively considerable, therefore, less than a cumulative significant vibration impact.

As discussed above, operational activities associated with Alternatives 1 or 2 would result in a less than significant vibration impact. Therefore, the contribution of Alternative 1 or 2 would be considered less than cumulatively considerable, therefore less than a cumulative significant vibration impact.

Permanent Increase in Ambient Noise Levels

c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

Refer to discussion 3.12 (a) above for existing ambient noise levels in the project area.

Project Impacts

Alternative 1

Less than significant impact. As previously described in CEQA Checklist Question 3.12 (a) above, increases in permanent operational noise levels would occur from the re-distribution of existing vehicular traffic and parking areas. As discussed, except for Fulton Street, Alternative 1 would not result in greater than 0.03 percent increase in traffic volumes over baseline conditions. A doubling of existing traffic volumes would be required to achieve a 3 dB increase in ambient noise levels. Because the increase in traffic volumes would be nominal, the proposed project would not result in substantial increases in ambient noise levels. Therefore, permanent noise impacts along the roadway segments would be less than significant.

New streets within Fulton Mall are proposed. The proposed project would result in 210 ADT on Fulton Street between Tuolumne Street and Inyo Street at project completion. None of the other road segments that will be converted from pedestrian use are through streets and would only service the immediate area. Therefore, traffic volumes along these segments would be less than those projected for Fulton Street. Considering this, traffic noise modeling was only conducted for Fulton Street, as it represents the worst-case scenario. As discussed in CEQA Checklist Question 3.12(a), Permanent noise levels along Fulton Mall under Baseline Plus Project for Alternative 1, would reach up to 42.5 dBA L_{eq} (h) and 42.7 dBA CNEL at the buildings adjacent to the Fulton Street rights-of-way. Existing ambient noise levels (59.9-70.7 dBA L_{eq}) are substantially louder than the projected Baseline Plus Project noise levels. Therefore, the implementation of Alternative 1 would not result in an adverse change to the existing ambient noise levels, would not exceed the City's noise standard of 60 dB CNEL, and would be considered less than significant.

Alternative 1 includes the relocation of two tot lots to one area that is adjacent to Congo Alley and approximately 72 feet from the proposed right-of-way of Mariposa Mall (Street). Since Mariposa Street would have less traffic volumes and less traffic noise compared to Fulton Street and the tot lots are 72 feet west of the Mariposa Street right-of-way compared to the existing structures adjacent to Fulton Street (approximately 20 feet), the permanent noise level under Alternative 1 would not exceed the City's most restrictive outdoor activity area standard of 60 dB L_{dn}.

Alternative 2

Less than significant impact. The determination of less than significant impacts regarding permanent increases in ambient noise levels as described above in CEQA Checklist Question 3.12 (a) above under Alternative 2 would be the same as for permanent noise increases for Alternative 2.

Cumulative Impacts

Less than significant impact. As described above in CEQA Checklist Question 3.12 (a), cumulative permanent noise levels under Alternative 1 or 2 would result in a less than significant cumulative traffic noise impact because the City of Fresno's noise standard of 60 dBA CNEL for sensitive uses such as residences would not be exceeded. Therefore, long-term cumulative traffic noise impacts would be less than significant.

The determination of less than significant cumulative permanent noise impacts from parking areas as well as to the proposed tot lots as described above in CEQA Checklist Question 3.12 (a) under Cumulative would be the same for cumulative permanent impacts.

Overall, Alternatives 1 or 2 would result in less than significant cumulative permanent noise impacts.

Temporary or Periodic Increase in Ambient Noise Levels

d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

City of Fresno Municipal Code

Chapter 10, Regulations Regarding Public Nuisances and Real Property Conduct and Use, Article 1, Noise Regulations, of the Fresno Municipal Code establishes excessive noise guidelines and exemptions. The following portions of the Municipal Code are applicable to the proposed project:

- SEC. 10-109 Exceptions. The provisions of this article shall not apply to:
  (a) Construction, repair or remodeling work accomplished pursuant to a building, electrical, plumbing, mechanical, or other construction permit issued by the city or other governmental agency, or to site preparation and grading, provided such work takes place between the hours of 7:00 a.m. and 10:00 p.m. on any day except Sunday.
  (b) Emergency work.
  (c) Any act or acts which are prohibited by any law of the State of California or the United States. (Added Ord. 72-163, 1972; Am. Ord. 80-171, § 74, eff. 12-26-80).

Project Impacts

Alternative 1

Less than significant impact. As previously discussed in CEQA Checklist Question 3.12 a), noise from construction activities may intermittently dominate the noise environment in the immediate area of construction. Construction noise is required to comply with applicable local, state, and federal regulations, and that all equipment shall be fitted with adequate mufflers according to the manufacturers' specifications.

No adverse noise impacts from construction are anticipated because the use of construction vehicles would only occur between the hours of 7:00 a.m. and 10:00 p.m. Monday through Saturdays and therefore, be exempt from the City of Fresno Noise Ordinance standards. Potential temporary or periodic noise associated with Alternative 1 would be less than significant.

Mitigation Measures

Although construction impacts would be less than significant, Mitigation Measures NOI-1 through NOI-4 are recommended to ensure the project's contribution to potential cumulative construction noise is minimized.

Implementation of Mitigation Measures NOI-1 through NOI-4 are recommended.

Alternative 2

Less than significant impact. The determination of less than significant impacts resulting from a substantial temporary or periodic increase in ambient noise levels in the project vicinity as discussed for Alternative 1 above would be the same for Alternative 2.

Mitigation Measures

Although construction impacts would be less than significant, Mitigation Measures NOI-1 through NOI-4 are recommended to ensure the project's contribution to potential cumulative construction noise is minimized.

Implementation of Mitigation Measures NOI-1 through NOI-4 are recommended.

Cumulative Impacts

Less than significant impact. There is a possibility that cumulative development may result in substantial increases in ambient noise levels from temporary or periodic noise levels if construction activities occur between 10:00 p.m. and 7:00 a.m. As described above in CEQA Checklist Question 3.12 a), cumulative short-term, temporary or periodic noise levels under Alternative 1 or 2 would result in a less than significant cumulative noise impact because the use of construction vehicles would only occur between the hours of 7:00 a.m. and 10:00 p.m. Monday through Saturdays. Because of compliance with the Noise Ordinance, the contribution of Alternative 1 or 2 to the potential cumulative increase in ambient noise levels from temporary or periodic noise levels would be less than cumulatively considerable. Therefore, Alternative 1 or 2 would result in less than significant cumulative temporary noise impacts.

Airport Noise Levels

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

Project Impacts

Alternative 1

No impact. The Fresno Chandler Downtown Airport is located 1.5 miles west of the project site. The proposed project site is located approximately 0.25 mile outside of the Fresno Chandler Downtown Airport Land Use Plan. The project does not include housing development or new business development. Therefore, project implementation would not expose people in the project area to excessive aircraft noise levels. No impact would occur.

Alternative 2

No impact. The determination of no potential to expose people in the project area to excessive aircraft noise levels as described above under Alternative 1 would be the same for Alternative 2.

Cumulative Impacts

No impact. Cumulative development in the immediate vicinity of the Fresno Chandler Downtown Airport may expose people to aircraft noise. Since the project site is located 1.5 miles east of the airport and approximately 0.25 mile outside of the Fresno Chandler Downtown Airport Land Use Plan, substantial aircraft noise at the project site is not expected. Furthermore, the project would not increase the population within the project boundary through housing developments or new business developments. Therefore, the implementation of Alternative 1 or 2 would not contribute to the cumulative exposure of people to aircraft noise. Thus, Alternative 1 or 2 would result in no cumulative aircraft noise exposure impacts.

Private Airstrip Noise Levels

f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

The project site is located within the existing Fulton Mall in the City of Fresno. There are one private airstrip located in the City of Fresno (Airnav.com 2012). The private airstrip is Sierra Sky Park Airport and is located approximately 8 miles north of the project site.

Project Impacts

Alternative 1

No impact. Due to the distance of the site from the Sierra Sky Park private airstrip, the implementation of Alternative 1 will not expose people associated with Alternative 1 to excessive aircraft noise levels **from a private airstrip.**

Alternative 2

No impact. The determination of no potential to expose people in the project area to excessive noise levels from private airstrips as described under Alternative 1 would be the same for Alternative 2.

Cumulative Impacts

No impact. Since the implementation of Alternative 1 or 2 would result in no impacts to expose people to excessive noise levels from private airstrips, Alternative 1 or 2 would result in no cumulative impacts.

3.13 - Population and Housing

Population Growth

a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

The following discussion of the inducement of population growth is based on information provided in the Community Impact Assessment that is provided in Appendix H of this Initial Study. In addition, information was obtained from the Fulton Mall Alternatives Plans, Economic Impact Analysis prepared by Gibbs Planning Group in 2011 and from the Fulton Mall Urban Decay Study, Fulton Corridor Specific Plan prepared by Rosenow Spevacek Group, Inc. in 2012. The latter two studies are available for review at the City of Fresno Development and Resource Management Department.

The Fulton Mall is limited to pedestrian traffic. This limitation has resulted in businesses within the immediate vicinity of Fulton Mall grossly under-performing and storefronts having a high vacancy rate. There is a lack of convenient parking spaces in front of stores, and no visibility for drive-by vehicular traffic. Parking is located around the perimeter of the study area; however, due to the broken street grid, motorists find it confusing to navigate to a parking area and then navigate to the businesses and stores by foot. There is no clear view into the Mall area from its ends, and the landscape largely blocks views of the storefronts.

The underperformance of the Fulton Mall has occurred for many years. Starting around 1970, business in Downtown Fresno began to decline due to increasingly rapid growth in the northern parts of the City and the opening of the major suburban shopping mall, Fashion Fair. This caused department stores within the Project Study Area to leave Downtown Fresno. The opening of additional shopping malls within the City resulted in further declines in economic activity in Downtown.

The immediate vicinity of Fulton Mall became an area of low levels of retail and other economic activity. In fact, urban decay data show that challenges in lease and vacancy rates are several times more severe on the Fulton Mall than in the rest of Downtown, compared with citywide and regional averages. The Project Study Area is devoid of any significant activity on weeknights after 5 pm when workers leave Downtown.

Numerous efforts are underway to address this problem. In 2010, property owners voted to create an assessment district, which is today managed by the Downtown Fresno Partnership. This district, which is centered on Fulton Mall, funds promotions, events, and advocacy on behalf of the area. The City is also undertaking a wholesale rewrite of its land use plans and zoning codes that govern the downtown, in order to encourage investment and development in Downtown and healthy, mixed-income neighborhoods in the surrounding 7,290 acres.

Project Impacts

Alternative 1

Less than significant impact. Implementation of Alternative 1 would eliminate the Fulton Mall and introduce two-way streets that would provide vehicular interconnectivity to adjacent roadways; no new businesses or housing is proposed. Because the project vicinity is already developed, the introduction of the new streets would not directly induce population growth and would not affect the regional population characteristics of the City.

Although the implementation of Alternative 1 does not include additional land uses within the project area, the provision of streets will increase access to the area. This increase in access is anticipated to influence growth within the project area. This growth is anticipated to occur through the reoccupation of the ground floors of existing vacant buildings as vehicle access and parking become available. This cause-and-effect relationship is bolstered by letters received from two Fulton Mall property owners and developers who recently acquired major historic buildings in support of a City application for funding related to the Fulton Mall Reconstruction Project. The owner of the JC Penney building, who is planning the creation of 66 housing units, wrote that “like any development project…access to and around the property is of utmost concern to me in making this kind of investment” (Maghame 2012). The owner of the Pacific Southwest and Helm Buildings, who is planning to develop a mix of housing, office, and entertainment space, wrote that “addressing the access and infrastructure issues surrounding my properties…is my main source of hesitation about investing in housing units there” (Khatchadourian, 2012).

This reoccupation is considered a beneficial impact on the existing land uses within the immediate vicinity of Fulton Mall because additional tenants and customers are expected to increase the economic productivity of the immediate vicinity of Fulton Mall.

Based on the Economic Impact Analysis for the Fulton Mall Alternative Plans prepared in June 2011, the reopening of Fulton Street and adding on-street parking under Alternative 1 is anticipated to reduce the existing ground floor vacancies from 26 percent to nine percent, close to citywide levels. The reoccupation would represent leasing approximately 79,200 sf of the existing 122,700 sf of vacant ground floor space. Assuming sales only at the present-day rate in the immediate vicinity of Fulton Mall of $78.88 per sf per year, the new occupancy would generate $6.25 million in annual sales. Nearly all of the sales tax, which would be $513,840 per year, would accrue to the City of Fresno.

Interest in developing in Downtown Fresno overall has been on the rise for several years. Because the density along the Fulton Mall is so much greater than other areas, activity in the immediate

vicinity of Fulton Mall fuels itself, and the increases in economic productivity expected to occur as a result of implementing Alternative 1 are therefore substantial.

Although Alternative 1 would result in the indirect inducement of growth including population growth within the Fulton Mall area, this inducement would result in the reoccupation of previously vacated buildings adjacent to Fulton Mall. This reoccupation of existing vacant buildings would be consistent with approved City land use plans and would not affect the regional population characteristics of the City. Therefore, implementation of Alternative 1 would not result in a substantial inducement of population growth. Thus, Alternative 1 would result in a less than significant impact on population growth.

Alternative 2

Less than significant impact. The determination of less than significant impacts from the inducement of population growth as described above under Alternative 1 would be the same for Alternative 2. The specific influence in growth under Alternative 2 would be the reduction of existing ground floor vacancies from 26 percent to 15 percent. The reoccupation under Alternative 2 would represent leasing approximately 51,900 sf of retail space of the existing 122,700 sf of vacant ground floor space. Assuming sales only at the present-day rate in the immediate vicinity of Fulton Mall of $78.88 per sf per year, the new occupancy would generate $4.09 million in annual sales. With the implementation of Alternative 2, the annual sales tax generated from the annual sales would be $336,721 per year.

Cumulative Impacts

Less than significant impact. Cumulative development within Downtown Fresno under the DNCP and FCSP will increase population within the City of Fresno. Based on current population estimates by Fresno Council of Governments, the anticipated increase in population that is currently expected for the year 2035 is consistent with the population estimate for the buildout of the DNCP and FCSP that is also projected for 2035. Therefore, population growth associated with cumulative development would result in a less than significant cumulative impact on population growth. Since the implementation of Alternative 1 or 2 as well as cumulative development would result in a less than significant impact on population growth, cumulative impacts on population growth would be less than significant. As a result, the contribution of Alternative 1 or 2 to the cumulative increase in population growth would be less than cumulatively considerable. Thus, Alternative 1 or 2 would result in less than significant cumulative impacts.

Housing Displacement/Replacement Housing

b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?

Project Impacts

Alternative 1

No impact. Construction of streets under Alternative 1 would not displace existing housing or require the construction of new housing. Therefore, implementation of Alternative 1 would not directly or indirect displace housing and would result in no impact.

Alternative 2

No impact. The determination of no direct or indirect impact on housing as described above under Alternative 1 would be the same for Alternative 2.

Cumulative Impacts

No impact. Development of cumulative projects in Downtown Fresno in accordance with the DNCP and FCSP may result in the displacement of existing housing. This displacement could be considered a significant cumulative impact. Since the implementation of Alternatives 1 or 2 would result in no impacts on housing, Alternatives 1 and 2 would not contribute to potential cumulative impacts. Therefore, Alternatives 1 or 2 would result in no cumulative impacts.

Population Displacement/Replacement Housing

c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?

Project Impacts

Alternative 1

No impact. Construction of streets under Alternative 1 would not displace existing population or housing or require replacement housing. Therefore, implementation of Alternative 1 would not directly or indirect displace population or housing and would result in no impact.

Alternative 2

No impact. The determination of no direct or indirect impact on population or housing as described above under Alternative 1 would be the same for Alternative 2..

Cumulative Impacts

No impact Development of cumulative projects in Downtown Fresno in accordance with the DNCP and FCSP may result in the displacement of existing population and housing. This displacement could be considered a significant cumulative impact. Since the implementation of Alternatives 1 or 2 would result in no adverse impacts on population or housing, Alternatives 1 and 2 would not contribute to potential cumulative impacts. Therefore, Alternatives 1 or 2 would result in no cumulative impacts.

3.14 - Public Services

Fire Protection

Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:

a) Fire protection?

The City Fire Department has 19 fire stations throughout the City and serves approximately 336 square miles. The nearest fire station (Station #3) to Fulton Mall is located at the southeast corner of Fresno Street and E Street, which is approximately 0.4 mile from Fulton Mall. Federal Alley and Home Run Alley/Congo Alley currently parallel Fulton Mall that could provide access to police and fire personnel in case of an emergency. The placement of streets along Fulton Mall would provide long-term improvement to police and fire personnel access to the structures along Fulton Mall. This long-term access for police and fire personnel would result in a beneficial impact on these services.

Project Impacts

Alternative 1

No impact. The project does not include new governmental facilities or alterations to existing facilities. Reintroducing roadways in place of the Fulton Mall would not require new governmental facilities to be provided or directly alter existing government facilities because service ratios, response times and performance objectives would not be affected. Moreover, the introduction of the roadways under this alternative would provide additional vehicular access for emergency vehicles that would be considered a beneficial impact. Therefore, project implementation would not result in impacts related to the provision of fire protection services.

Alternative 2

No impact. The determination of no impacts related to the provision of fire protection services described for Alternative 1 would be the same for Alternative 2.

Cumulative Impacts

No impact. The project does not include new governmental facilities or alterations to existing facilities. Reintroducing roadways in place of the Fulton Mall would not require new governmental facilities to be provided or directly alter existing government facilities because service ratios, response times, and performance objectives would not be affected. Moreover, the introduction of the roadways under this alternative would provide additional vehicular access for emergency vehicles that would be considered a beneficial impact. Therefore, project implementation would not result in cumulatively significant impacts related to the provision of fire protection services.

Police Protection

b) Police protection?

The City of Fresno Police Department operates five police stations within the City. The nearest station to Fulton Mall is located at 2323 Mariposa Mall, which is within the Project Study Area.

According to Captain Greg Garner, the police captain in charge of the Southwest Policing District which includes the Project Study Area, most criminal acts are committed around the Fulton Mall are crimes of opportunity. While criminal offences range from severe (such as armed robbery) to minor (such as loitering), the most common offences include petty theft, vandalism, and illegal panhandling (Urban Decay Study 2012).

Project Impacts

Alternative 1

No impact. The project does not include new governmental facilities or alterations to existing facilities. Reintroducing roadways in place of the Fulton Mall would not require new governmental facilities to be provided or directly alter existing government facilities because service ratios, response times, and performance objectives would not be affected. Moreover, the introduction of the roadways under this alternative would provide additional vehicular access for police emergency vehicles that would be considered a beneficial impact. Captain Garner believes that opening the Mall to traffic has the potential to have a beneficial impact on reducing crime (Urban Decay Study). Therefore, project implementation would not result in impacts related to the provision of police protection services.

Alternative 2

No impact. The determination of no impacts related to the provision of police protection services described for Alternative 1 would be the same for Alternative 2.

Cumulative Impacts

No impact. The project does not include new governmental facilities or alterations to existing facilities. Reintroducing roadways in place of the Fulton Mall would not require new governmental facilities to be provided or directly alter existing government facilities because service ratios, response times, and performance objectives would not be affected. Moreover, the introduction of the roadways under Alternative 1 or 2 would provide additional vehicular access for police emergency vehicles that would be considered a beneficial impact. Captain Garner, with the Fresno Police Department, believes that opening the Mall to traffic has the potential to have a beneficial impact on reducing crime (Urban Decay Study). This beneficial impact could result in a reduction in the demand for police services in the Fulton Mall area. Therefore, project implementation would not result in cumulatively significant adverse impacts related to the provision of police protection services.

Schools

c) Schools?

Project Impacts

Alternative 1

No impact. The reintroduction of streets in place of the pedestrian mall would not result in direct impacts to school facilities. The nearest schools to the project are the Fresno Academy for Civic and Entrepreneurial Leadership School (Fresno Unified School District charter school) located approximately 0.20 mile southwest of the project site and the Fresno County Special Education Local Plan School (public) located approximately 0.07 mile northeast of the project site. Project implementation would not affect the vehicular access to either of these two schools nor would it require any physical alteration to these governmental facilities. Therefore, implementation of the proposed project would not result in any impacts related to schools.

Alternative 2

No impact. The determination of no impacts related to the provision of school services described for Alternative 1 would be the same for Alternative 2.

Cumulative Impacts

No impact. The reintroduction of streets in place of the pedestrian mall would not result in significant cumulative impacts to school facilities. The nearest schools to the project are the Fresno Academy for Civic and Entrepreneurial Leadership School (Fresno Unified School District charter school) located approximately 0.20 mile southwest of the project site and the Fresno County Special Education Local Plan School (public) located approximately 0.07 mile northeast of the project site. Project implementation would not affect the vehicular access to either of these two schools nor would it require any physical alteration to these governmental facilities. Therefore, implementation of the proposed project would be less than cumulatively considerable. .

Parks

d) Parks?

Project Impacts

Alternative 1

No impact. The project does not include new parks or alterations to existing facilities. Reintroducing roadways in place of the Fulton Mall would not require new park facilities to be provided or require directly altering existing government facilities because the introduction of new roadways would not directly affect service ratios or performance objectives related to parks. Therefore, project implementation would not result in impacts related to the parks.

Alternative 2

No impact. The determination of no impacts to parks described for Alternative 1 would be the same for Alternative 2.

Cumulative Impacts

No impact. The project does not include new parks or alterations to existing facilities. Reintroducing roadways in place of the Fulton Mall would not require new park facilities to be provided or require directing altering existing governmental facilities because the introduction of new roadways would not directly affect service ratios or performance objectives related to parks. Therefore, project implementation would not result in cumulatively considerable impacts.

Other Public Facilities

e) Other public facilities?

Project Impacts

Alternative 1

No impact. The Central Library is located approximately 0.3 mile northeast of the Fulton Mall. Because of the distance between the Fulton Mall and the Central Library, improvements associated with implementing this alternative would not result in the need to alter this governmental facility. Replacing the Fulton Mall with vehicular roadways would interconnect the street system but would not directly increase the use of the Central Library. Moreover, implementation of Alternative 1 would provide a beneficial effect by providing greater access to existing facilities within Fulton Mall. Therefore, implementation of this alternative would not result in the need to alter this governmental facility or provide a new, similar or replacement governmental facility and no impacts would occur.

Alternative 2

No impact. The determination of no impact to other public facilities described for Alternative 1 would be the same for Alternative 2.

Cumulative Impacts

No impact. Improvements associated with implementing he project would not result in the need to alter other public facilities. Replacing the Fulton Mall with vehicular roadways would interconnect the street system, and the project would provide a beneficial effect by providing greater access to existing facilities within Fulton Mall. Therefore, the project would not adversely affect public facilities and would not be cumulatively considerable.

3.15 - Recreation

Increase Use of Parks and Recreational Facilities Physical Effect on Environment

a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

and

b) Does the project include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment?

The City of Fresno currently has a mix of regional, community, neighborhood, pocket, and mini parks within the city limits. A limited number of parks are provided in the downtown area. No parks are located within the immediate vicinity of Fulton Mall. There are two recreational areas for children within Fulton Mall. These areas are tot lots with playground equipment and sand areas. One of the tot lots is located within Fulton Mall immediately north of Kern Mall and encompasses 966 square feet of active play equipment area. The second tot lot is also within Fulton Mall immediately south

of Merced Mall and encompasses 806 square feet of active play equipment area. Today most, though not all, of this equipment remains functional for the children to use.

Project Impacts

Alternative 1

Less than significant impact. The implementation of the build Alternative 1 for the proposed Fulton Mall Reconstruction project will result in direct effects to the existing tot lots that are used for public recreation. The two tot lots encompass approximately 1,772 square feet of active play equipment area. Alternatives 1 would result in the relocation of the tot lots and they will be consolidated into one larger tot lot within the Project Study Area at the Fresno County Economic Opportunities Commission campus near the intersection of Mariposa and Congo Alley. During the construction period, the removal of this resource would create a temporary adverse effect. The provision of an equal square footage of active play space within the Project Study Area will reduce the long-term effect so that the effect is not adverse. The long-term restoration or replacement of the playground equipment will provide a beneficial recreational effect because all equipment will be functional for the children to use.

Alternative 2

Less than significant impact. The determination of less than significant impacts to other recreational facilities under Alternative 2 would be the same as described above for Alternative 1.

Cumulative Impacts

Less than significant impact. The provision of an equal square footage of active play space within the Project Study Area will reduce the long-term effect so that the effect is not adverse. The long-term restoration or replacement of the playground equipment will provide a beneficial recreational effect because all equipment will be functional for the children to use. Therefore, the project would be less than cumulatively considerable.

3.16 - Transportation and Traffic

Traffic Increase

a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?

The following is a summary of the analysis in the Final Transportation Impact Report for Fulton Mall Reconstruction Project and the Fulton Mall Supplemental Traffic Analysis - 2025 General Plan prepared by Fehr & Peers in July 2013 and September 2013, respectively. The report is provided in Appendix J.1 and analysis is provided in Appendix J.2 of this Initial Study.

Study Area

The selected Study Area was determined through consultation with City of Fresno and Caltrans District 6 staff, the "City of Fresno Traffic Impact Study Report Guidelines" (City of Fresno, 2009), and the transportation impact analysis conducted for the Downtown Neighborhoods Community Plan (DNCP) and Fulton Corridor Specific Plan (FCSP).

Fulton Mall is located at the center of Fresno's Central Business District, and consists of six blocks bounded by Van Ness Avenue to the east, Inyo Street to the south, Broadway to the west, and Tuolumne Street to the north. The Fulton Mall project area includes an approximately 2,670-foot long north-south pedestrian-only mall along Fulton Street, with three shorter east-west pedestrian malls on Merced Street, Mariposa Street, and Kern Street where they cross the Fulton Mall. Together, the total linear length of the pedestrian mall complex is approximately 4,620 feet. Fresno Street and Tulare Street carry east-west traffic through the project area with traffic signals where they cross Fulton Mall.

Intersections

The following 18 study intersections and 16 roadway segments were evaluated.

1. Stanislaus Street/Van Ness Avenue
2. Stanislaus Street/Fulton Street
3. Stanislaus Street/Broadway
4. Tuolumne Street/Broadway
5. Tuolumne Street/Fulton Street
6. Tuolumne Street/Van Ness Avenue
7. Fresno Street/H Street
8. Fresno Street/Fulton Street
9. Fresno Street/Van Ness Avenue
10. Tulare Street/H Street
11. Tulare Street/Fulton Street
12. Tulare Street/Van Ness Avenue
13. Inyo Street/H Street
14. Inyo Street/Fulton Street
15. Inyo Street/Van Ness Avenue
16. Ventura Avenue/H Street
17. Ventura Avenue/Broadway
18. Ventura Avenue/Van Ness Avenue

Fresno Street currently travels under H Street via a grade-separated underpass. The City of Fresno intends to make this an at-grade intersection in the future. The Fresno Street/Fulton Street and Tulare Street/Fulton Street intersections are current locations where Fulton Mall crosses these east-west streets with traffic signals to allow pedestrians to cross.

Methodology

The traffic analysis used the most recent adopted Fresno Council of Governments (COG) regional model to identify the base year. The base year version of the model was modified and calibrated within the study area to more accurately reflect baseline conditions by using baseline traffic counts collected in the field between March 2009 and January 2012. The baseline conditions roadway operations analysis uses roadway geometrics and traffic control as observed in Fall 2011.

This study analyzes traffic operations using level of service (LOS) as the primary measure of performance. Roadway LOS is a qualitative description of traffic flow from the perspective of motorists. The *Highway Capacity Manual* (HCM) (Transportation Research Board, 2000) defines six levels of service from LOS A representing the least congested traffic conditions to LOS F representing

the most congested traffic conditions. The City of Fresno *Traffic Impact Study Report Guidelines* (2009) and Caltrans' *Guide for the Preparation of Traffic Impact Studies* (2002) recommend using the HCM methodology. Given the recent release of the 2010 HCM and current limitations in the software and application of the 2010 HCM, City of Fresno and Caltrans District 6 staff agreed on the use of the 2000 HCM methodology for this study.

Intersection LOS is based on the control delay experienced by motorists traveling through the intersection. At signalized intersections, the LOS is determined by the average control delay per vehicle, as described in Chapter 16 of the 2000 HCM. Unsignalized intersections are evaluated using the methodology contained in Chapter 17 of the 2000 HCM. The 2000 HCM does not define an overall intersection LOS for side-street stop-controlled intersections; therefore, at side-street stop-controlled intersections, this study reports the control delay and LOS for the movement with the greatest control delay.

Level of Service Policy
According to the 2025 Fresno General Plan, Policy E-1-f states that level of service D is the acceptable level of traffic congestion on major streets.

Baseline Conditions
The level of service (LOS) for morning (AM) and evening (PM) peak hours at the study area intersections during current (baseline) conditions were identified in the traffic report. The report identified that baseline conditions at the study area intersections currently operate at a LOS D or better which is considered acceptable.

Project Impacts

Alternative 1

Less than significant impact. Alternative 1 includes the addition of two-lane, two-way streets within Fulton Mall. This Alternative does not propose any additional traffic generating land uses. With the addition of new streets, Alternative 1 would cause some shifts in local traffic patterns. To evaluate this shift in traffic patterns, a locally validated version of the 2010 Fresno COG TDF model was used to estimate the re-distribution of traffic in the study area. The Fresno COG TDF model confirmed that opening Fulton Mall to vehicular traffic would not affect traffic volumes outside the study area. The model also confirmed that opening the mall to vehicular traffic resulted in minor changes to traffic patterns, primarily on Fulton Street and parallel facilities, such as Van Ness Avenue.

A baseline plus project condition was evaluated for the AM and PM peak hour at the study area intersections. The project condition was opening the Mall to traffic. As shown in the traffic report, the AM and PM peak hours would continue to operate at LOS D or better during the baseline plus project condition. Therefore, the implementation of Alternative 1 would result in a less than significant impact on traffic conditions.

Alternative 2

Less than significant impact. The determination of less than significant impact on traffic conditions under Alternative 2 would be the same as described for Alternative 1.

Cumulative Impacts

Less than significant impact with mitigation measures incorporated. Under Cumulative Conditions, the traffic evaluation uses local and regional planning and funding documents to identify the reasonably foreseeable changes to the transportation system and development patterns in the Fresno region. The cumulative analysis includes the future implementation of the DNCP and FCSP by the year 2035. In addition to the DNCP and FCSP, the cumulative projects includes a financially constrained list of transportation projects for which funding has been identified or is reasonably expected to be available within the RTP planning horizon of 2035. All of these projects are included in the 2035 Fresno COG TDF model used in this cumulative conditions analysis. The Cumulative No Project conditions analysis reflects anticipated conditions without the proposed Fulton Mall Reconstruction Project. This includes the cumulative transportation and land use development changes identified above, including projected development within the project area consistent with the DNCP and FCSP.

A cumulative no project condition was evaluated for the AM and PM peak hour at the study area intersections. The traffic report and analysis described that there were five intersections that would operate at LOS E or F during the AM and/or PM peak hour under the Cumulative No Project condition. These five intersections include the following:

1. Stanislaus Street/Broadway Street
2. Tuolumne Street/Broadway Street
3. Fresno Street/H Street
4. Fresno Street/Van Ness Avenue
5. Ventura Avenue/H Street

A Cumulative Plus Project (Alternatives 1 or 2) Conditions was evaluated for the AM and PM peak hour at the study area intersections. Given there would be intersections that would not operate at an acceptable level of service under the Cumulative No Project Condition, the City of Fresno's Traffic Impact Study Report Guidelines were reviewed to determine the significance criteria for projects with intersections not operating acceptable levels prior to adding a proposed project. According to the City of Fresno's Traffic Impact Study Report Guidelines, a significant impact would occur if the project increases the average delay for a study intersection that is already operating at an unacceptable level. Based on the evaluation in the Fulton Mall Supplemental Traffic Analysis - 2025 General Plan, there would be four intersections that would operate at an unacceptable level of service during the AM and/or PM peak hour under the Cumulative Plus Project Conditions. A discussion of the contribution of project traffic to traffic delays at these four intersections is provided below.

Stanislaus Street/Broadway Street

The technical calculations show that the overall intersection delay at this intersection decreases slightly from 165 seconds to 159 seconds during the PM peak hour with the proposed project. Therefore, the project would not have a cumulatively significant impact at this location.

Tuolumne Street/Broadway Street

The technical calculations show that the overall intersection delay at this intersection increases from 541 seconds to 723 seconds during the PM peak hour with the proposed project. Therefore, the project would have a potentially significant impact at this location.

Fresno Street/H Street

At this intersection, the traffic delay would decrease with the proposed project during the AM and PM peak hours. Therefore, the project would not have a cumulatively significant impact at this location

Ventura Avenue/H Street

The Cumulative No Project and Cumulative Plus Project traffic volumes at this intersection indicate that the proposed project is not expected to result in a substantial change in traffic at this location. In the AM peak hour, two turning movements have a minor increase in traffic volumes that can be attributed to rounding and model variation. In the PM peak hour, one turning movement has a minor increase while one has a minor decrease that can also be attributable to rounding and model variation. In the AM peak hour, the change in traffic volumes through the intersection is an increase of less than one percent, which is well within observed variation in day-to-day traffic. Therefore, this change is not considered cumulatively significant. In the PM peak hour, there is no net change in traffic volumes through the intersection. Similarly, this change is not considered cumulatively significant.

To reduce the project's contribution to a potential significant traffic impact at the Tuolumne Street/Broadway Street intersection, the following mitigation measure is required.

MM TR-1 Prior to the Tuolumne Street/Broadway Street intersection degrading to worse than LOS D, the City of Fresno shall modify the existing signal to allow the split phase operations on northbound and southbound Broadway Street. If the City of Fresno adopts a revision to the current LOS standard of LOS D and allows LOS F for Downtown Fresno intersections prior to the intersection degrading to worse than LOS D, then the recommended improvement would not be required.

The implementation of the recommended improvement would reduce the delay at the Tuolumne Street/Broadway Street intersection to 33 seconds, and the intersection would operate at LOS C that complies with the City's current LOS standard. Therefore, the proposed project's contribution to a potential cumulative impact is less than cumulatively considerable, thus less than cumulatively significant.

Level of Service Standards

b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?

In 1996 California Assembly Bill 2419 was passed, which allowed counties to "opt out" of the California Congestion Management Program, if a majority of local governments elected to exempt

themselves from California's Congestion Management Plans. On September 25, 1997, the Fresno Council of Governments (COG) Policy Board rescinded the Fresno County Congestion Management Program at the request of the local member agencies.

Project Impacts

Alternative 1

No impact. As addressed above, the Fresno COG Policy Board rescinded the Fresno County Congestion Management Program in 1997. Therefore, because there is no applicable congestion management program, the implementation of Alternative 1 will have no impact on a congestion management program.

Alternative 2

No impact. The determination of no impact to a congestion management program for Alternative 2 would be the same as described above for Alternative 1.

Cumulative Impacts

No impact. Cumulative development includes development projects within the Downtown area, including the DNCP and FCSP. As identified above, there is no applicable congestion management program within Fresno County, therefore, there would be no cumulative impact on a congestion management program.

Air Traffic Patterns

c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?

The nearest airport or airstrip to the Fulton Mall site is the Fresno Chandler Executive Airport, which is just over one mile west of the project site. According to the Fresno-Chandler Downtown Airport Environs Plan, which is located within the Fresno-Chandler Downtown Airport Land Use Policy Plan, the project site is located outside of the Traffic Pattern Zone for the airport (Fresno County Airport Land Use Commission 2000).

Project Impacts

Alternative 1

No impact. Since the nearest airport or airstrip to the Fulton Mall site is outside the Traffic Pattern Zone for the nearest airport, land uses within the project site would not interfere with air traffic patterns. Additionally, while the implementation of Alternative 1 would result in new roadway segments within Fulton Mall and result in a redistribution of traffic in the project area, it would not interfere with, and would not impact, air traffic patterns associated with the Fresno Chandler Executive Airport.

Alternative 2

No impact. The determination of no impact on air traffic patterns under Alternative 2 would be the same as described above for Alternative 1.

Cumulative Impacts

No impact. Cumulative development in the project vicinity includes development within the City of Fresno Downtown area. The cumulative development includes development in accordance with the DNCP and FCSP as well as developments that are currently proposed in the vicinity of Fulton Mall. Portions of the DNCP are located adjacent to the Fresno Chandler Executive Airport. Development in these areas would be guided by the policies within the 2025 Fresno General Plan Safety Element (City of Fresno 2002). Policy I-7-b states that future development is required to be in compliance with Subpart C of the Federal Aviation Regulations Part 77 (U.S. Government Printing Office, 2013). Subpart C includes the "Standards for Determining Obstructions to Air Navigation or Navigational Aids or Facilities." The 2025 Fresno General Plan is anticipated to be updated in the near future. Under the General Plan Update, there is draft Policy NS-5-a that states development is required to comply with Part 77 of the Federal Aviation Administration Regulations for airport approach and departure zones. Future cumulative development is anticipated to result in no cumulative impact related to air traffic patterns. Since the proposed project (Alternatives 1 and 2) will also result in no impacts to air traffic patterns, the implementation of Alternatives 1 and 2 would result in no cumulative impacts to air traffic safety.

Hazards

d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

Currently, Fulton Mall is bisected by Tulare Street and Fresno Street and is bound by Inyo Street, Van Ness Avenue, Tuolumne Street and Broadway/H Street. Pedestrian signals exist at Tulare Street and Fresno Street to allow pedestrian to travel from one portion of the Mall to another.

Project Impacts

Alternative 1

Less than significant impact. Alternative 1 includes reopening Fulton Mall with two-way streets, with one lane of vehicular traffic in each direction alongside bicycle, pedestrian, and potentially other travel modes. This alternative also includes a parallel parking lane on both sides of the street. Alternative 1 would introduce vehicular traffic within Fulton Mall and vehicles would interact with pedestrians and bicyclists in an area where no vehicular traffic occurs. Alternative 1 includes the addition of traffic signals at Tulare Street and Fresno Street as well as 4-way signals at Inyo Street and Tuolumne Street. The implementation of Alternative 1 could potentially increase traffic hazards in the Fulton Mall because this alternative would add a vehicular component to the Mall. However, since the streets proposed under this alternative are similar to the existing streets throughout Downtown Fresno, no substantial increase in traffic hazards would occur. Therefore, potential impacts would be less than significant.

Alternative 2

Less than significant impact. Alternative 2 also includes reconnecting the street grid similar to Alternative 1, but would include rebuilding distinctive elements of the Mall in five to six specific locations, known as vignettes. The vignettes would have one travel lane in each direction and would

slightly curve throughout the vignettes to avoid existing landscape features. The vignettes could have one parallel parking lane on one side of the street, and thus areas outside of the roadway surface would be increased for pedestrians in the vignette areas compared to Alternative 1. In addition, due to the design of a curve through the vignette area, the speed limit would be 25 miles per hour compared to 30 miles per hour outside of the vignette area. The development of Alternative 2 could potentially increase traffic hazards within Fulton Mall; however, the streets that are outside the vignette areas are similar to the existing streets throughout Downtown Fresno. The reduced speed limit through the vignette areas would minimize traffic hazards. The implementation of Alternative 2 would not substantially increase traffic hazards. Therefore, potential traffic hazard impacts associated with Alternative 2 would be less than significant.

Cumulative Impacts

Less than significant impact. A substantial amount of cumulative development in Downtown Fresno is anticipated over the next 20 years. The increase in development may result in conditions that could result in increases in traffic hazards. This increase could be considered cumulatively significant. With the development of Alternatives 1 and 2, potential traffic hazard impacts are expected to be less than significant. The contribution of potential traffic hazards would be less than cumulatively considerable because the roadway design for Alternatives 1 and a majority of Alternative 2 would be similar to existing streets throughout Downtown Fresno. In the remaining areas of Alternative 2, such as the vignettes, speed limits will be reduced and minimize potential traffic hazards. The implementation of Alternatives 1 and 2 would result in traffic safety impacts that are considered less than cumulatively considerable, thus less than cumulatively significant.

Emergency Access

e) Result in inadequate emergency access?

Existing city streets in the vicinity of Fulton Mall currently provide emergency service to existing land uses. For the uses within Fulton Mall, Federal Alley and Home Run Alley/Congo Alley parallel Fulton Mall and provide adequate access for police and fire personnel.

Project Impacts

Alternative 1

Less than significant impact. Construction activities associated with Alternative 1 could impede emergency services; however, construction would occur in one-block segments where different construction activities could be occurring in different blocks. The alleys that currently provide emergency access will be available to provide emergency access during construction. Therefore, short-term impacts on emergency services would be less than significant. During long-term conditions, the addition of roadways within Fulton Mall will provide long-term beneficial impacts to emergency access. Emergency vehicles will be able to use the alleys adjacent to Fulton Mall or the new roadways within Fulton Mall to access existing land uses. As addressed in Checklist Question 16 a) above, Alternative 1 will result in increases and decreases at intersections in the project vicinity. Although increases at intersections will occur, an acceptable level of service at intersections in the vicinity of Fulton Mall would be maintain with the addition of Alternative 1 to existing conditions.

Maintaining an acceptable level of service would result in a less than significant impact to emergency access in the Fulton Mall vicinity.

Alternative 2

Less than significant impact. The determination of less than significant emergency access impacts from the implementation of the proposed project under Alternative 2 would be the same as described above for Alternative 1.

Cumulative Impacts

Less than significant with mitigation. Development of cumulative projects, such as the DNCP and FCSP as well as other currently proposed projects in Downtown Fresno, would increase traffic volumes in Downtown Fresno. This increase in cumulative traffic volumes in the vicinity of Fulton Mall could impact emergency access.

As discussed in Checklist Question 16 a) above, the implementation of Alternatives 1 and 2 and the cumulative projects would result in significant impacts to four intersections in the year 2035. As discussed, the implementation of Alternatives 1 and 2 would substantially contribute to the exceedance of the City's LOS standard of LOS D or better at one intersection, Tuolumne Street/Broadway Street, during cumulative conditions. Therefore, Alternatives 1 and 2 would result in a significant cumulative traffic impact that could also result in a significant cumulative emergency access impact.

To reduce the contribution of Alterative 1 and 2 to the significant cumulative impact at the Tuolumne Street/Broadway Street intersection, the following mitigation measure is required.

MM TRANS-1 Prior to the Tuolumne Street/Broadway Street intersection degrading to worse than LOS D, the City of Fresno shall modify the existing signal to allow the split phase operations on northbound and southbound Broadway Street. If the City of Fresno adopts a revision to the current LOS standard of LOS D and allows LOS F for Downtown Fresno intersections prior to the intersection degrading to worse than LOS D, then the recommended improvement would not be required.

As described in Checklist Question 16 a), the implementation of the recommended improvement would reduce the delay at the intersection to 33 seconds and the intersection would operate at LOS C that complies with the City's current LOS standard. Maintaining intersections at the City's LOS standard would reduce the project's (Alternatives 1 and 2) potential emergency access impact to less than cumulatively considerable, thus less than cumulatively significant.

Conflict with Alternative Transportation

f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?

Less than significant impact. The 2025 Fresno General Plan and the City of Fresno Bicycle, Pedestrian, and Trails Master Plan includes various plans and policies regarding public transit, bicycle, and pedestrian facilities. Following are the plans and policies.

City of Fresno 2025 General Plan

- **Policy E-1-j:** Provide areas for pedestrian and other non-motorized travel that enhance the safety, utilization, and efficiency of the street system.
- **Policy E-1-l:** All commercial and office development should be linked with pedestrian, bicycle, and transit facilities.
- **Policy E-1-n:** Safe access and mobility for the physically impaired must be implemented in the design of all pedestrian facilities.
- **Policy E-13-a:** Provide bikeways in proximity to major traffic generators such as commercial centers, schools, recreational areas, and major public facilities.
- **Policy E-20-d:** Safe vehicular, bicycle, and pedestrian access shall be provided and maintained. Access for the disabled shall be incorporated into the project designs as required.

City of Fresno Bicycle, Pedestrian and Trails Master Plan

The currently approved Downtown Bicycle Facilities plan identifies Fulton Mall as a pedestrian mall where bikes are allowed; however, the plan does not designate any existing Class I, 2, or 3 bicycle facilities within Fulton Mall.

The existing Multimodal Connections Plan identify transit lines along Van Ness Avenue, H Street, Inyo Street, Fresno Street, and Tuolumne Street and no existing transit routes in Fulton Mall since vehicles are prohibited within Fulton Mall.

- **Policy E-13-a-1:** Provide bikeways connecting to and in proximity to major traffic generators such as commercial centers, schools (K-12, junior college, and universities), recreational areas/parks, health service facilities, and major public facilities to meet daily needs.
- **Policy E-13-a-7:** Require that bicycle detection be installed at all new traffic signals in Fresno. Promote the retrofitting of existing traffic signals to include bicycle detection and the re-timing of signals to make them more bicycle-friendly.
- **Policy E-13-b-1:** Require major traffic-generating uses (such as major shopping centers, office complexes, industrial parks, schools, and public service facilities) to design on-site parking (indoor or outdoor) and circulation areas to facilitate bicycle travel.
- **Policy E-13-b-2:** Promote the installation of bicycle locking racks and bicycle parking facilities at public buildings, transit facilities, public and private parking lots, and recreational facilities. Establish and adopt standards for the implementation of bicycle parking.

Project Impacts

Alternative 1

No impact. Implementation of Alternative 1 would result in a temporary closure of a bike pathway within Fulton Mall during construction activities. This temporary closure would not impact bicyclists because bicyclists could access other existing bicycle facilities that are located within the surrounding street network.

According to the approved Downtown Bicycle Facilities plan, Fulton Mall allows bicycles. Under Alternative 1, bicycles will be allowed on the new streets within Fulton Mall. In addition, the *City of Fresno Bicycle, Pedestrian and Trails Master Plan* identifies multimodal connections and Alternative 1 would not impede the existing transit connections in the vicinity of Fulton Mall.

Alternative 1 would be consistent with the applicable policies regarding public transit, bicycle, and pedestrian facilities that are identified in the 2025 Fresno General Plan because the new streets within Fulton Mall will allow bicycle travel which would be consistent with Policies E-1-j, E-1-l, and E-13-a. Alternative 1 also includes American Disability Act (ADA) ramps at each intersection for safe travel by disabled persons. The provisions of the ramps are required and would be consistent with Policies E-1-n and E-20-d.

Alternative 1 would also be consistent with the applicable policies regarding bicycle facilities in the City of Fresno Bicycle, Pedestrian and Trails Master Plan. The provision of new streets that will allow bicycle travel will contribute to bicycle connections between existing bicycle facilities and be consistent with Policies E-13-a-1 and E-13-b-1. In addition, the project includes 20-foot sidewalks that will provide adequate space for bicycle parking facilities, which would be consistent with Policy E-13-b-2. Furthermore, Alternative 1 includes new and modified traffic signals at intersections within directly adjacent to Fulton Mall. These new and modified signals would provide for pedestrian and bike detection and be consistent with Policy E-13-a-7.

Overall, the implementation of Alternative 1 would be consistent with the existing plans and policies that are currently provided for public transit, bicycle, or pedestrian facilities. Alternative 1 would not impact public transit, bicycle, and pedestrian facilities.

Alternative 2

No impact. The determination of no impact on public transit, bicycle, or pedestrian facilities under Alternative 1 would be the same as described above for Alternative 1.

Cumulative Impacts

No impact. Development of the proposed project under Alternative 1 and 2 with the future cumulative development that would occur under the DNCP and FCSP as well as other downtown projects would substantially increase the use of roadways, public transit, bikeways, and pedestrian facilities. Cumulative development is not expected to result in inconsistencies with the City's plans and policies related to public transit, bikeways, and pedestrian facilities, and therefore, no cumulative impact is expected. In addition, as stated above, the implementation of Alternative 1 and 2 would result in no impacts on public transit, bicycle, and pedestrian facilities and therefore,

Alternatives 1 and 2 would not contribute to cumulative impacts. Thus, the project would result in no cumulative impacts on public transit, bicycle, and pedestrian facilities.

3.17 - Utilities and Service Systems

A technical report on utilities in the Downtown Fresno area was prepared. This report is Fulton Corridor Specific Plan and Community Plan EIR Technical Report prepared by Sherwood Design Engineers in February 2013 and is provided in Appendix K.1 of this Initial Study. In addition, memorandum letters were prepared by the City of Fresno to supplement the information in the Report identified above. These memorandum letters include "Water Supply and Delivery Infrastructure Within The Downtown Plans Area" prepared by Brock Buche and "Response to Questions Related to DNCP and FCSP Environmental Studies" prepared by Stephen Hogg and provided in Appendix K.2 and K.3, respectively, of this Initial Study. The following information was obtained from the Report and memorandum letters.

The utilities in the Fulton Mall vicinity include water, sewer, drainage, natural gas, electricity, and telecommunication systems (i.e., cable and telephone). The water, sewer, and drainage facilities are owned by the City of Fresno while the natural gas and electricity is owned by Pacific, Gas & Electric, and telecommunication systems in the Fulton Mall Project Study Area are not known.

Water distribution and transmission facilities are currently located within Federal Alley east of Fulton Mall and within Home Run Alley and Congo Alley west of Fulton Mall, respectively, between Inyo Street and Tuolumne Street. These facilities range from 6-inch to 12-inches in diameter. Additional water distribution lines also ranging in diameter from 6-inch to 12-inches are located within Inyo Street, Kern Mall and Street, Tulare Street, Mariposa Mall, Fresno Street, and Tuolumne Street. Each of the existing water distribution and transmission facilities identified above are currently adequate to serve the existing uses (Sherwood Design Engineers 2012, see Appendix K.1 of this Initial Study).

Public and private sewer distribution facilities are located within the Fulton Mall vicinity. Public sewer facilities include up to 30-inch lines within Merced Mall between Van Ness Avenue and H Street, Kern Mall and Street from Van Ness Avenue to Home Run Alley, and Home Run Alley between Kern Mall and Inyo Street. Private sewer lines are located within Federal Alley, Home Run Alley, and Congo Alley except for the portion of Home Run Alley south of Kern Mall. Each of the existing sewer facilities identified above is currently adequate to serve the existing uses. No sewer lift stations are located within the rights-of-way of Fulton Mall (Sherwood Design Engineers 2012 see Appendix K.1 of this Initial Study). The sewer facilities, while adequately sized to serve existing uses, are of very advanced age and in poor condition. The City of Fresno Department of Public Utilities has plans to rebuild these facilities with local funds. The sewer replacement project is anticipated to occur simultaneously with the implementation of the Fulton Mall Reconstruction Project.

Storm drain facilities are located within the Fulton Mall vicinity. A storm drain is located under Fulton Mall between Inyo Street and Tuolumne Street. Addition storm drains are located within Merced Mall between Van Ness Boulevard and H Street, Fresno Street between Van Ness Boulevard and H Street, Mariposa Mall between the Federal Alley and H Street, Tulare Street between Home Run Alley and H Street, Kern Mall between Home Run Alley and Federal Alley, and along Home Run

Alley between Kern Mall and Tulare Street. Each of the existing drainage distribution facilities identified above is currently adequate to serve the existing uses (Sherwood Design Engineers 2012 see Appendix K.1 of this Initial Study).

Natural gas, electricity, and telecommunication systems are located in the Fulton Mall vicinity. The specific locations of these facilities are not known at this time; however, it is known that some of these facilities are located within Fulton Mall.

Wastewater Treatment

a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?

As a condition of a Clean Water Grant issued by the Federal government, the City of Fresno was designated the Regional Sewer Agency for the Fresno-Clovis Metropolitan Area (FCMA) in 1966. The City operates the Regional Wastewater Reclamation Facility (RWRF) under a Joint Powers Agreement with Clovis and the County of Fresno. The 3,000-acreRWRF was originally constructed in 1947, and is located inside the City limits but within a non-contiguous area situated approximately 3.5 miles southwest of the Chandler Executive Airport. Over the past 40 years, the RWRF has been expanded and rehabilitated several times, most recently in 2010 when process units were added to the facility to address high organic concentrations within incoming wastewater. The treatment plant includes a number of redundant facilities that allow for regular maintenance and provide backup capacity in the event of equipment failure. The RWRF currently provides secondary treatment and has a rated capacity of 80 million gallons per day, with equipment redundancy to accommodate maintenance schedules or equipment failures. Effluent disposal occurs primarily through a combination of infiltration beds located at the RWRF and agricultural irrigation (Sherwood Design Engineers 2011, see Appendix K.1 of this Initial Study). Based on information in the report prepared by Sherwood Design Engineers, current treatment at RWRF is less than 75 percent of the current capacity.

Project Impacts

Alternative 1

No impact. Under this alternative, no wastewater would be directly generated, and there would be no direct impacts on wastewater treatment capacity or wastewater treatment requirements. Based on information in the Fulton Mall Urban Decay Study (2012), the reopening of Fulton Street and adding on-street parking under Alternative 1 would induce growth through the reoccupation of existing office and retail vacant space within the vicinity of Fulton Mall through the year 2035. According to CEQA Guidelines Section 15126.2(d), “[i]t must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment.” The anticipated growth inducement and its potential effects are addressed as part of cumulative impacts because the future growth that would occur from the reoccupation of existing office and retail vacant space is considered to occur as part of future projects. The potential impacts associated with the anticipated growth are addressed below under cumulative impacts.

Alternative 2

No impact. The determination of no impact on wastewater treatment capacity or wastewater treatment requirements as discussed above for Alternative 1 would be the same for Alternative 2. In addition, Alternative 2 would also result in a similar inducement of growth through the reoccupation of existing vacant office and retail space. The potential impacts associated with the anticipated growth are addressed below under cumulative impacts.

Cumulative Impacts

No impact. Implementation of cumulative development will result in increases in the generation of wastewater in Downtown Fresno. Part of this cumulative increase is the projected increase from the reoccupation of existing office and retail vacant space in the vicinity of Fulton Mall as well as throughout Downtown Fresno. With cumulative development through 2035 throughout Downtown Fresno, a greater amount of vacant office and retail space is projected to be reoccupied within the vicinity of Fulton Mall with the implementation of Alternative 1 or 2 compared to without the implementation of Alternative 1 or 2. This potential increase in the reoccupation of vacant office and retail space would be part of future growth and the implementation of future cumulative projects throughout the City. The anticipated increase in the reoccupation with Alternative 1 in the year 2035 would be approximately 188,254 square feet of office use and approximately 80,000 square feet of retail use more than without the addition of streets and parking within Fulton Mall. The anticipated increase in the reoccupation with Alternative 2 in the year 2035 would be approximately 188,254 square feet of office and approximately 51,300 square feet of retail use more than without the addition of streets and parking within Fulton Mall.

Cumulative development within the City through the year 2035 is anticipated to generate more wastewater than the current capacity of the existing RWRF (Sherwood Report 2013). According to the Sherwood Report, cumulative growth through 2035 is anticipated to generate approximately 87 million gallons per day (mgd) which is greater than the current treatment capacity of 80 mgd. Since treatment capacities are projected to be greater than the current treatment capacity, cumulative development throughout the City through 2035 could result in the exceedance of wastewater treatment requirements.

Part of the future cumulative increase in wastewater generation includes the wastewater generation from cumulative growth that is anticipated to be induced by the development of Alternative 1 or 2. As stated above, Alternative 1 would result in the inducement of the reoccupation of approximately 188,254 square feet of office use and approximately 80,000 square feet of retail use. The potential reoccupation of space under Alternative 1 would increase existing wastewater flows to the RWRF. For the purpose of this evaluation, wastewater flows from the reoccupation of currently vacant space is based on a worst-case assumption that employees generate the same amount of wastewater as residents. Under this assumption, a wastewater generation factor of 110 gallons per capita per day was used for employees, and the factor was obtained from the Sherwood Report. Employees for an office use and retail use are based on a national average employment density for office uses of 291 square feet per employee and based on 400 square feet per person for retail employment. The employment densities were obtained from the Community Impact Assessment provided in Appendix H of this Initial Study (pages 44 and 45). Based on the employment densities and the cumulative growth from reoccupying vacant space, the increase in office use would generate

approximately 647 employees and the increase in retail use would generate approximately 200 employees for a total of 847 employees. Therefore, based on the additional 847 employees at a wastewater generation factor of 110 gallons per capita per day, there would be approximately 0.093 mgd generated. This increase in wastewater generation from the portion of cumulative growth that would be induced as a result of implementing Alternative 1 would contribute to the cumulative exceedance of the current wastewater treatment capacity and could result in the cumulative exceedance of wastewater treatment requirements. Since Alternative 2 would result in a slightly less inducement of the reoccupation of vacant office and retail space, the portion of cumulative growth associated with Alternative 2 would result in less generation of wastewater compared to Alternative 1; however, wastewater generation from the induce growth associated with Alternative 2 would still contribute to significant cumulative impacts on the existing treatment capacity at RWRF and could result in the cumulative exceedance of wastewater treatment requirements. Growth that will occur from the reoccupation of existing vacant space and from new developments will be associated with future cumulative projects. The implementation of these cumulative projects are anticipated to result in significant cumulative impacts on the current wastewater treatment capacity and could result in significant cumulative impacts associated with wastewater treatment requirements of the Regional Water Quality Control Board (RWQCB).

Although cumulative impacts may be significant, the implementation of Alternative 1 or 2 would not directly generate wastewater, and therefore, Alternative 1 or 2 would not contribute to the potential significant cumulative impacts projected with the implementation of future growth anticipated through the year 2035. Therefore, the implementation of Alternative 1 or 2 would result in no cumulative impacts to existing wastewater treatment capacities or potential exceedances of wastewater treatment requirements regulated by the RWQCB.

Water or Wastewater Treatment Facilities

b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

Project Impacts

Alternative 1

No impact. Under this alternative, no wastewater would be directly generated. Therefore, the implementation of Alternative 1 would result in no impacts on existing wastewater treatment facilities.

As discussed in CEQA Checklist Question 3.17 a) above, Alternative 1 would result in the inducement of growth through the reoccupation of existing office and retail vacant space within the vicinity of Fulton Mall through the year 2035. This potential growth is part of cumulative projects, and the potential cumulative impacts are addressed under cumulative impacts in CEQA Checklist Question 3.17 a), above.

This alternative would result in the demand for water supplies for irrigating the proposed landscaping as well as maintaining fountains. However, this demand for irrigation and maintenance

is expected to be less than the current demand because there will be fewer fountains to maintain. The number of trees to irrigate under Alternative 1 is the same number as the existing trees. Due to a reduction in water requirements under Alternative 1 compared to existing conditions, the existing water lines that are located in and adjacent to Fulton Mall will be adequate to convey water to the proposed landscaping and fountains. No new water lines will be required as part of Alternative 1. Therefore, Alternative 1 would result in no impacts to existing water facilities.

As described above in CEQA Checklist Question 3.17 a),, Alternative 1 is projected to induce growth by the reoccupation of existing vacant space within the vicinity of Fulton Mall. This potential growth is part of cumulative projects, and the potential cumulative impacts are addressed under cumulative impacts, below.

Alternative 2

No impact. The determination of no impact as discussed for Alternative 1 is the same for Alternative 2.

Cumulative Impacts

No impact. As discussed in CEQA Checklist Question 17 a), Alternative 1 or 2 would result in no cumulative impacts on wastewater facilities.

Implementation of cumulative development will result in increases in the demand for water in Downtown Fresno. Part of this cumulative increase is the projected increase from the reoccupation of existing office and retail vacant space in the vicinity of Fulton Mall as well as throughout Downtown Fresno. With cumulative development through 2035 throughout Downtown Fresno, a greater amount of vacant office and retail space is projected to be reoccupied within the vicinity of Fulton Mall with the implementation of Alternative 1 or 2 compared to without the implementation of Alternative 1 or 2. This potential increase in the reoccupation of vacant office and retail space would be part of future growth and the implementation of future cumulative projects throughout Downtown Fresno. The anticipated increase in the reoccupation with Alternative 1 in the year 2035 would be approximately 188,254 square feet of office use and approximately 80,000 square feet of retail use more than without the addition of streets and parking within Fulton Mall. The anticipated increase in the reoccupation with Alternative 2 in the year 2035 would be approximately 188,254 square feet of office and approximately 51,300 square feet of retail use more than without the addition of streets and parking within Fulton Mall.

Based on a review of the supplemental letter memorandum prepared by Brock Buche (see Appendix K.2 of this Initial Study), cumulative development in Downtown Fresno could result in a significant impact on existing water facilities. As stated in the supplemental letter memorandum, a new 3 million gallon water storage tank and a new regional transmission main would be required to serve future development in Downtown Fresno. In addition, cumulative development in Downtown Fresno would need to replace some 6-inch diameter water lines with 8-inch diameter water lines to improve hydraulic conditions and meet demands and fire service levels. The water storage tank is planned for a property located on H Street, southeast of Ventura Avenue. The regional transmission main would convey water from Well Site 172 and other wells in the vicinity to turnouts in the downtown area, including locations near Fulton Mall.

Part of the future cumulative increase in water demand includes the water demand from cumulative growth that is anticipated to be induced by the development of Alternative 1 or 2. According to the letter memorandum from Brock Buche, the growth that occurs from the reoccupation of current vacant office and retail space within the vicinity of Fulton Mall will also result in a significant impact on existing water facilities, thus also requiring the new 3 million gallon water storage tank and new regional transmission main discussed above. In addition, some 6-inch diameter water lines may need to be replaced with 8-inch diameter water lines to improve hydraulic conditions to meet demands and fire service levels. As discussed in the letter memorandum, the addition of the water supply facilities identified above will be adequate to support the re-occupancy of the buildings along Fulton Mall.

Although cumulative impacts on water facilities may be significant, the implementation of Alternative 1 or 2 would not directly increase the existing demand for water; therefore, Alternative 1 or 2 would not contribute to the potential significant cumulative impacts on existing water facilities projected with the implementation of future Downtown Fresno growth anticipated through the year 2035. Therefore, the implementation of Alternative 1 or 2 would result in no cumulative impacts on existing water facilities.

Stormwater Drainage Facilities

c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

Storm drain facilities are located within the Fulton Mall vicinity. A storm drain is located under Fulton Mall between Inyo Street and Tuolumne Street. Additional storm drains are located within Merced Mall between Van Ness Boulevard and H Street, Fresno Street between Van Ness Boulevard and H Street, Mariposa Mall between Federal Alley and H Street, Tulare Street between Home Run Alley and H Street, Kern Mall between Home Run Alley and Federal Alley, and along Home Run Alley between Kern Mall and Tulare Street. Each of the existing drainage distribution facilities identified above are currently adequate to serve the existing uses (Sherwood Design Engineers 2012, see Appendix K.1 in this Initial Study).

The pedestrian mall is currently served by 95 storm drain inlets that collected surface flows from the project area. Adjacent streets such as Fresno and Tulare Streets also have their own storm drain facilities that convey flows from the roadway. Both the onsite and adjacent storm drain facilities presently connect with the existing storm drain facilities located throughout Fulton Mall vicinity. These existing storm drain facilities are connected to one of several larger east-west and northeast-southwest trending trunk lines, which eventually connect with a series of existing drainage basins located along S. West Street in the southwestern portion of the City of Fresno. As previously stated, the existing subsurface drainage distribution facilities identified above are currently adequate to serve the existing uses found in the project area.

Project Impacts

Alternative 1

No impact. Since Alternative 1 would result in generally the same amount of impervious surfaces within Fulton Mall compared to existing conditions, there would not be an increase in stormwater

flow from Fulton Mall. Although Alternative 1 would not result in an increase in stormwater flow, Alternative 1 will modify the location of the existing storm drain inlets. The existing storm drain inlets that are located within the future street (i.e., between the proposed curbs and gutters of each street) will be relocated to the curb face because the future streets will be designed to include a crown in the middle of the street so that surface water will flow to the curb face.

The project will also include the reconstruction of the sidewalks adjacent to the future streets. Therefore, there may be relocation of additional existing storm drain inlets. The inlets may remain in the sidewalks or the sidewalk may be graded so that surface water flows to the street and eventually to the storm drain inlets at the curb face.

Although the implementation of Alternative 1 will modify the location of the stormwater inlets throughout Fulton Mall, the existing subsurface drainage distribution facilities will continue to be adequate to convey storm water from the Fulton Mall vicinity after the implementation of Alternative 1.

Alternative 2

No impact. The determination of no impacts to existing storm drain distribution facilities as discussed above for Alternative 1 would be the same for Alternative 2.

Cumulative Impacts

No impact. The implementation of Alternative 1 or 2 would not result in the construction of new storm water drainage distribution facilities or expansion of existing facilities. Therefore, Alternative 1 or 2 would result in no cumulative impacts to existing storm water drainage facilities.

Water Supplies

d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?

Water supplies to the Fulton Mall vicinity are limited by the existing water distribution facilities in the project vicinity. These facilities are currently located within Federal Alley east of Fulton Mall and within Home Run Alley and Congo Alley west of Fulton Mall, respectively, between Inyo Street and Tuolumne Street. These facilities range from 6-inch to 12-inches in diameter. Additional water distribution lines also ranging in diameter from 6-inch to 12-inches are located within Inyo Street, Kern Mall and Street, Tulare Street, Mariposa Mall, Fresno Street, and Tuolumne Street.

Based on a review of the City of Fresno Urban Water Management Plan (2010), the City's water supply is provided by groundwater, treated surface water, recycled water, and conservation efforts. The City currently has existing water entitlements through a contract with the Fresno Irrigation District for water from the Kings River and a contract with the U.S. bureau of Reclamation for water from the San Joaquin River. Based on Figure 4-3 of the Urban Water Management Plan, future water supplies will increase primarily due to increases in the treated surface water, recycled water and addition conservation efforts while decreasing reliance on groundwater supplies. The supplies

identified by the City of Fresno are estimated to meet the City's demand from future growth beyond the next 20 years.

Project Impacts

Alternative 1

No impact. The implementation of Alternative 1 would result in the demand for water supplies for irrigating the proposed landscaping as well as maintaining fountains. However, this demand for irrigation and maintenance is expected to be less than the current demand because there will be fewer fountains to maintain. The number of trees to irrigate under Alternative 1 is the same number as the existing trees. With a reduce demand for water, the implementation of Alternative 1 will result in no impacts on water supplies from existing entitlements and resources.

As discussed in CEQA Checklist Question 3.17 b), Alternative 1 is projected to induce growth by the reoccupation of existing vacant office and retail space within the vicinity of Fulton Mall. This potential growth is part of cumulative projects, and the potential cumulative impacts are addressed under cumulative impacts, below.

Alternative 2

No impact. The determination of no impact as discussed in Alternative 1 above would be the same for Alternative 2.

Cumulative Impacts

No impact. As discussed in CEQA Checklist Question 3.17 b), the implementation of cumulative development will result in increases in the demand for water in Downtown Fresno. Part of this cumulative increase is the projected increase from the reoccupation of existing office and retail vacant space in the vicinity of Fulton Mall as well as throughout Downtown Fresno. Based on a review of the City's Urban Water Management Plan, existing water entitlements and projected water supplies are estimated to meet the City's demand from the development of cumulative projects as well as from the reoccupation of existing vacant space beyond the next 20 years. Therefore, cumulative projects will result in no impacts on water supplies from existing entitlements and resources. Since the implementation of Alternative 1 or 2 would not increase the demand for water, Alternative 1 or 2 would result in no cumulative impacts on water supplies from existing entitlements and resources.

Wastewater Treatment Capacity

e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

Project Impacts

Alternative 1

No impact. As discussed in CEQA Checklist Question 3.17 a) above, Alternative 1 would not generate wastewater, and therefore, Alternative 1 would result in no impact on existing wastewater treatment capacity.

Alternative 2

No impact. The determination of no impact as discussed in Alternative 1 above would be the same for Alternative 2.

Cumulative Impacts

No impact. As discussed in CEQA Checklist Question 17 a), Alternative 1 or 2 would result in no cumulative impacts on wastewater facilities.

Landfill Capacity

f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?

Project Impacts

Alternative 1

Construction Phase

Less than significant impact. During the short-term construction phase, demolition activities will result in material that will need to be hauled offsite. The material could be transported to a recycling center or the existing American landfill located west of the City of Fresno. The amount of demolition material is not expected to result in a substantial amount of material that would substantially affect the existing landfill capacity. Therefore, impacts to the existing landfill would be less than significant.

Operations Phase

Less than significant impact. During the long-term operations phase, minor amounts of refuse may be generated during maintenance activities. This minor amount of solid waste would result in a less than significant impact on existing landfills.

Alternative 2

Less than significant impact. The determination of less than significant impact on landfills discussed under Alternative 1 would be the same for Alternative 2.

Cumulative Impacts

Less than significant impact. The contribution of potential solid waste during construction and operational activities associated with Alternative 1 or 2 would not be substantial and would be considered less than cumulatively considerable. Cumulative impacts would be less than significant.

Compliance with Solid Waste Regulations and Statutes

g) Comply with federal, state, and local statutes and regulations related to solid waste?

Project Impacts

Alternative 1

Less than significant impact. Development under this alternative is not anticipated to conflict with federal, state, and local statutes and regulations related to solid waste because development is anticipated to comply with applicable City of Fresno 2025 General Plan goals and policies and comply with the City of Fresno Municipal Code requirements and diversion requirements regarding solid waste disposal. Therefore a less than significant impact is anticipated.

Alternative 2

Less than significant impact. The determination of less than significant impact on solid waste regulations and statutes described in Alternative 1 would be the same for Alternative 2.

Cumulative Impacts

Less than cumulative impact. The proposed project would not contribute to conflicts with solid waste regulations and statutes and would result in less than cumulatively considerable impacts. Therefore, project impacts would be less than significant.

3.18 - Mandatory Findings of Significance

a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?

Potentially significant impact. Development of Alternative 1 or 2 would result in potential direct impacts to nesting birds and indirect impacts to roosting bat species. These potential impacts would be considered significant prior to mitigation. Mitigation measures are recommended to reduce these potential significant impacts to less than significant. In addition, the proposed project would remove the pedestrian mall of Fulton Mall which is a historical resource. This removal would cause a significant unmitigatable impact to a resource listed on the California Register of Historic Resources.

b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?

Potentially significant impact. Implementation of Alternative 1 or 2 would result in cumulative impacts associated with aesthetics, biological resources, cultural resources, hazards and hazardous materials, hydrology and water quality, land use, and traffic as discussed in CEQA Checklist Questions 3.1.1 through 3.1.17. Mitigation measures are recommended to reduce potential significant impacts to less than significant. However, cumulative impacts associated with aesthetics and historical resources would remain significant and unavoidable.

c) Does the project have environmental effects, which will cause substantial adverse effects on human beings, either directly or indirectly?

Potentially significant impact. Development of Alternative 1 or 2 may cause substantial adverse effects on humans due to the potential significant and unavoidable impacts that are expected to occur related to the removal of the existing trees within Fulton Mall as well as removal of the pedestrian mall, a historic resource.

SECTION 4: REFERENCES

California Department of Conservation. 2013. California Important Farmland Finder. Website: http://maps.conservation.ca.gov/ciff/ciff.html. Accessed on September 29, 2013.

Central Valley Regional Water Quality Control Board. 2013. Case Closure, Underground Storage Tank Release, Greyhound Bus Depot, 1033 Broadway, Fresno, Fresno County, RB Case 5T10000457. May 14.

City of Fresno. 2013. City of Fresno General Plan Map Atlas (Williamson Act Property in the Fresno area). Website: http://www.fresno.gov/NR/rdonlyres/243E6033-9A3A-46A5-971B-E5FC7A2775EA/0/MapAtlasFinalVersionSept12011.pdf. Accessed on September 29, 2013.

City of Fresno. 2013. City of Fresno Zoning Map. Website: http://www.fresno.gov/Government /DepartmentDirectory/InformationServices/GIS/Layers.htm. Accessed on September 29, 2013.

City of Fresno. 2002. 2025 Fresno General Plan. Website: http://www.fresno.gov/Government /DepartmentDirectory/DARM/AdvancedPlanning/2025FresnoGeneralPlan.htm.

City of Fresno. 2002. 2025 Fresno General Plan. Website: http://www.fresno.gov/Government /DepartmentDirectory/DARM/AdvancedPlanning/2025FresnoGeneralPlan.htm

Department of Transportation. 2013. Fulton Mall Reconstruction Supplemental Assessment to Fulton Corridor Phase I ESA, Fresno County, California. May 29.

Fehr & Peers. 2010. City of Fresno Bicycle, Pedestrian, & Trails Master Plan. Website: http://www.fresno.gov/NR/rdonlyres/5DBFAA2D-5352-47D2-84BA-3A9BEDC99351 /0/FresnoBMP.pdf.

Fehr & Peers. 2013. Memorandum: Fulton Mall Supplemental Traffic Analysis - 2025 General Plan. September 6.

Fehr & Peers. 2013. Final Transportation Impact Report, Fulton Mall Reconstruction Project. July 12.

FirstCarbon Solutions | Michael Brandman Associates. 2013. Fulton Mall Reconstruction Project. Community Impact Assessment. Fulton Mall, City of Fresno, Fresno County, California. Federal Project # TCSPL-5060(263). September 5.

FirstCarbon Solutions | Michael Brandman Associates. 2013. Fulton Mall Reconstruction Project. Paleontological Resource Assessment. Fulton Mall, City of Fresno, Fresno County, California. Federal Project # TCSPL-5060(263). September 5.

FirstCarbon Solutions | Michael Brandman Associates. 2013. Technical Memorandum: Sole-Source Aquifer - Water Quality Assessment. July 9.

FirstCarbon Solutions | Michael Brandman Associates. Fulton Mall Reconstruction Project Noise Study. Fulton Mall, City of Fresno, Fresno County, California. Federal Project # TCSPL-5060(263). September 5.

FirstCarbon Solutions. 2013. Natural Environment Study (Minimal Impacts). Fulton Mall, City of Fresno. Fresno County, California. Federal Project # TCSPL-5060(263). July.

FirstCarbon Solutions. 2013. Fulton Mall Reconstruction Project Visual Impact Assessment. Fulton Mall, City of Fresno. Fresno County Airport Land Use Commission. Revised February 2000. Fresno-Chandler Downtown Airport Land Use Policy Plan, Fresno-Chandler Downtown Airport Environs Plan. Website: http://www.fresnocog.org/sites/default/files/publications /ALUC/Chandler_CLUP_2000_revision.pdf.

Fresno County, California. Federal Project # TCSPL-5060(263). September 4.

Michael Brandman Associates. 2013. Air Quality Analysis Report, Fulton Mall Reconstruction Project. Federal Transportation Improvement Program. August.

U.S. Government Printing Office. 2013. Federal Aviation Administration, Department of Transportation, Part 77, Subpart C—Standards for Determining Obstructions to Air Navigation or Navigational Aids or Facilities. Website: http://www.ecfr.gov/cgi-bin/text-idx?c=ecfr&SID=a29127578d704f800914e6e83954cebe&tpl=/ecfrbrowse/Title14/14cfr77_main_02.tpl.

Initial Study
Fulton Mall Reconstruction Project
City of Fresno, Fresno County, California
Appendices

Prepared for:
City of Fresno
2600 Fresno Street
Fresno, CA 93721
559.621.8371

Contact: Wilma Quan, Urban Planning Specialist

Prepared by:
FirstCarbon Solutions
220 Commerce, Suite 200
Irvine, CA 92602
714.508.4100

Contact: Michael Houlihan, AICP

Report Date: October 15, 2013

Appendix A:
Visual Impact Assessment

Fulton Mall Reconstruction Project

Visual Impact Assessment

Fulton Mall, City of Fresno
Fresno County, California

Federal Project # TCSPL-5060(263)

September 4, 2013

STATE OF CALIFORNIA
Department of Transportation

Prepared By: Michael Houlihan, AICP, FirstCarbon Solutions
714.508.4100

Prepared For: California Department of Transportation

1. Introduction

This Visual Impact Assessment (VIA) was prepared for the City of Fresno for the proposed Fulton Mall Reconstruction Project. The purpose of this VIA is to document potential visual impacts caused by the proposed project and propose measures to lessen any detrimental impacts that are identified. This VIA was prepared using a process developed by the Federal Highway Administration (FHWA). The visual impacts are demonstrated by identifying visual resources in the project area, measuring the amount of change that would occur as a result of the project, and predicting how the affected public would respond to or perceive those changes. This assessment defines the visual assessment methodology, existing visual environment, and quantitatively evaluates the visual impact.

2. Project Description

The City of Fresno, in cooperation with the California Department of Transportation (Caltrans), proposes to convert the pedestrian-only paths associated with the Fulton Mall into multi-use roadways to reintroduce vehicle traffic into the Downtown Mall Area. The purpose of the proposed project is to improve parking and vehicle access to local businesses on Fulton Street in order to maximize economic productivity in conjunction with other downtown redevelopment projects. The proposed project would also be intended to increase activity by re-introducing vehicular traffic, providing bike lanes, and refurbishing sidewalks and seating, removing or rehabilitating the existing 21 fountains, and repairing or relocating the existing 20 sculptures.

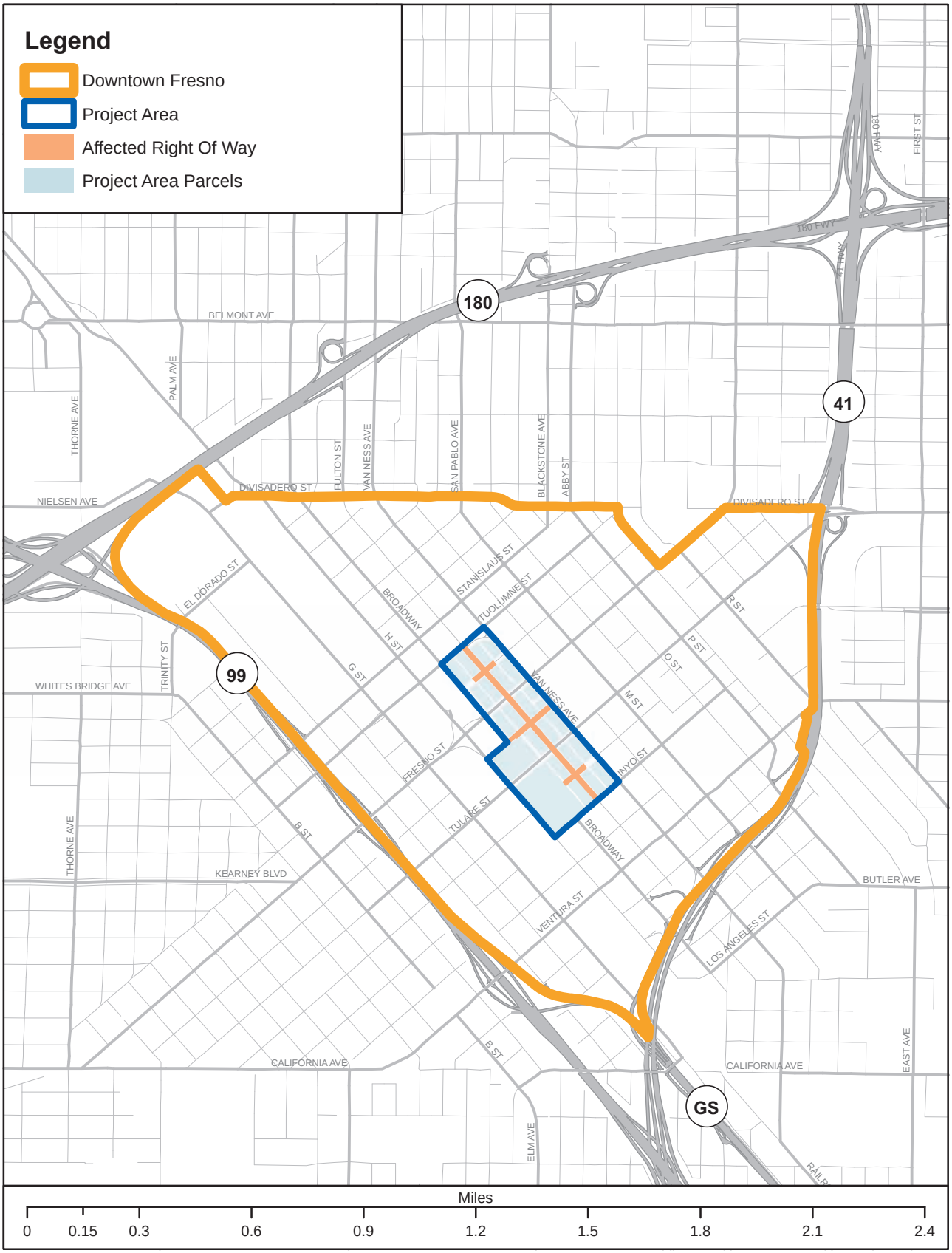
Additionally, increased activity frequently results in lower crime and an improved feeling of safety for people walking between parking areas and businesses located on the Fulton Mall and for visitors to the Mall who live or work in the area.

2.1 Project Location

The proposed project is centrally located in downtown Fresno, within Fresno County, south of State Route (180), west of SR-41 and east of SR-99 (Figure 1). The proposed project is specifically located north of Inyo Street, south of Tuolumne Street, east of Broadway Street and west of Van Ness Avenue. The project vicinity is depicted on Figure 2.

2.2 Project Description

The California Department of Transportation (Caltrans), as assigned by the Federal Highway Administration (FHWA), in cooperation with the City of Fresno (City) proposes to reconstruct Fulton Mall as a complete street by reintroducing vehicle traffic lanes to the existing pedestrian mall. The Mall consists of six linear blocks that were open to traffic prior to 1964 but has been closed to vehicular traffic since that time. Opening up the mall to vehicular traffic will restore it to the original design. The Mall is bounded by Tuolumne Street to the north and Inyo Street to the south, and includes portions of three cross streets. The total length of the new roadways would be 0.74 mile. Figures 1 and 2 show project vicinity and location maps.



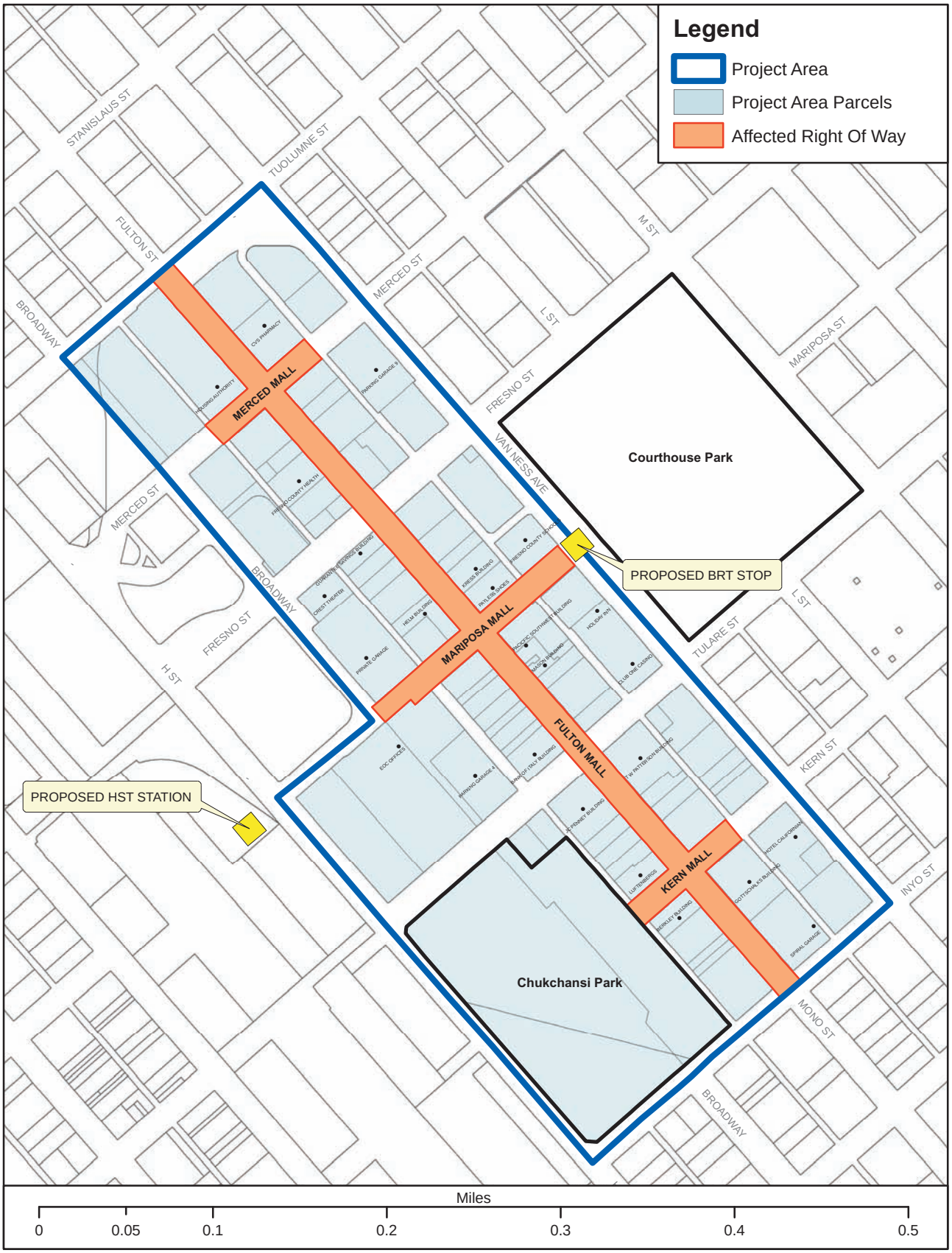
NORTH

Michael Brandman Associates

Figure 1
Project Vicinity Map

31680017 • 07/2013 | 1_project_vicinity.cdr

CITY OF FRESNO • FULTON MALL PROJECT
VISUAL IMPACT ASSESSMENT



Michael Brandman Associates

Figure 2
Project Location Map

31680017 • 07/2013 | 2_project_location.cdr

CITY OF FRESNO • FULTON MALL PROJECT
VISUAL IMPACT ASSESSMENT

The “Mall” refers specifically to the pedestrian areas between adjoining buildings located on the former City of Fresno streets of Fulton Avenue, Mariposa Avenue, Merced Avenue, and Kern Street, which function as an integrated pedestrian Mall. Fresno Street and Tulare Street, which do allow vehicle traffic, run through the Mall and divide it into three roughly equal sections. Mall landscaping elements include fountains, planters, benches, sculptures, electrical systems, irrigation systems, and two “tot lots.” For the purposes of this project, “The Mall” does not include the adjoining buildings or their facades.

Each Build Alternative proposes to reconstruct the Mall using “complete streets” design concepts. Complete streets are those designed to function as shared public space, or as “living streets”—for pedestrians, cyclists, outdoor businesses, and slow-moving, cautiously driven vehicles. Complete streets may include narrow roadways, corner bulb-outs, winding streets, and other traffic calming measures to lower driving speeds; street trees and other landscape elements; wide pedestrian sidewalks and crosswalks; and bicycle accommodations such as dedicated bicycle lanes or wide shoulders. The purpose of incorporating these design concepts into the proposed project is to retain portions of the historic fabric and character of the Mall, maintaining the key elements, feeling and unique experience of a pedestrian mall in downtown Fresno.

The proposed project has three Alternatives, including two Build Alternatives and a No Build Alternative.

Alternative 1 consists of reopening the Mall with two-way streets, with one lane of vehicular traffic in each direction alongside bicycle, pedestrian, and potentially other travel modes. On-street vehicle parking spaces would be reintroduced along the length of the Mall (including cross streets), and construction of streetscape improvements would optimize the streets for the new blend of travel modes. One 11-foot vehicle travel lane would run in each direction, with a parallel parking lane of 9 feet included on both sides of the streets. A 20-foot sidewalk included on both sides of the streets would allow for walking and pedestrian-only seating, landscaping, lighting, and public art.

The existing 20 works of sculpture present on the Mall today would all remain, although some may be moved to be incorporated in sidewalk areas of the new streetscape. Only the three fountains found along the Kern Mall, west of Fulton, would remain. All of the planter beds and raised seating areas found along the Mall today would be removed in favor of wide sidewalks that incorporate artwork and seating areas.

Most of the existing 144 trees would be removed and replaced. The two tot lots, one located near the corner of Merced and Fulton, and the other located near the corner of Kern and Fulton, would be relocated and potentially combined into one larger tot lot near the future intersection of

Mariposa Avenue and Congo Alley west of Fulton Street. The final location and design of the tot lots have not yet been solidified. Impacts to previously undisturbed soil during project construction are not anticipated.

Alternative 2 consists of reconnecting the street grid as in Alternative 1, but would include rebuilding distinctive elements of the Mall in five to six specific locations, known as "vignettes." The vignettes would include many of the existing elements (sculptures, fountains, pavement pattern, trees, etc.). One 11-foot vehicle travel lane would run in each direction and would curve through the vignettes to avoid existing landscape features. Outside the vignette areas, the street would be straight, and the landscape would include a 9-foot parallel parking lane and a pedestrian-only walking, seating, vegetation, and public art area 20 feet in width on one or both sides of the street. Within the vignettes, the existing Mall landscape elements would be kept maximally intact. The remaining space on each side of the street would be dedicated to pedestrian travel, seating, vegetation, and artwork.

Of the existing 144 trees, all but about 30 would be removed and replaced. A total of 12 fountains—nine in vignettes and three on Kern Mall west of Fulton—would remain in place. The 12 fountains would be fully rebuilt or restored to working order. Fourteen of 20 sculptures would remain in their current locations. The other six sculptures (along with the various tile mosaics benches on the Mall today) would be configured differently within the current right-of-way to accommodate the new streetscape. Street lighting outside the vignettes would be contemporary and pedestrian-oriented, but the current Mall fixtures would be rehabilitated within each vignette. The two existing tot lots, one located near the corner of Merced and Fulton and the other located near the corner of Kern and Fulton, would be relocated and potentially combined into one larger tot lot near the future intersection of Mariposa Avenue and Congo Alley west of Fulton Street. The final location and design of the tot lots have not yet been solidified. Impacts to previously undisturbed soil during project construction are not anticipated.

The City of Fresno is currently in the process of determining the future location of the tot lot and anticipates that the tot lot will be relocated to an area south of the future construction of Mariposa Street and west of Congo Alley.

The third Alternative is the No-Build Alternative. New streets would not be constructed and the Mall would remain as it now exists.

3. Existing Visual Environment

3.1 Regional Setting

The region is characterized by the relatively flat San Joaquin Valley that rises into the Sierra Nevada Mountains to the northeast and east. The San Joaquin River extends along the north side of the City and County boundary of Fresno and the Madera County boundary. Due to the relatively flat terrain of the valley, views of the high-rise buildings within downtown Fresno can be viewed from great distances in all directions.

In the late 1800s, Fresno began to colonize, and the land use became predominately agricultural. Development began to occur within the downtown area of Fresno subsequent to the construction of the Central Pacific Railroad that extended through the San Joaquin Valley. In the first few decades of the 1900s development continued to occur within Fresno including major high-rise buildings in the downtown area, where the Fulton Mall was later constructed in the early 1960s.

3.2 Project Setting

Distant views from within the Fulton Mall area are limited due to the surrounding high-rise development. Pedestrians who travel within Fulton Mall have very few locations where distant views are available. These distant views are located on the edges of the Mall and typically along existing streets. Within the Mall, pedestrian views are internal and include the various features of the Mall including trees and shrubs, pavement, planters, sculptures, fountains, seating areas, and other artwork.

There are approximately 144 trees and a large number of shrubs and flowers that provide a visual relief to the urban environment within the Mall. However, although not evaluated by an arborist or urban forester, most of the trees do not appear to be well maintained due to the presence of broken or crossing limbs, misshapen trunks, and roots protruding into the concrete sidewalks. However, the mature trees provide shade, which is much needed in the warmer months in Fresno.

Because the streets with vehicular traffic in the immediate vicinity are perpendicular to the mall, views to the storefronts along the public streets that are adjacent to Fulton Mall such as Inyo Street, Tulare Street, Fresno Street, and Tuolumne Street are limited. Limited views of storefronts do not allow motorists or pedestrians traveling along Inyo Street, Tulare, Street, Fresno Street, and Tuolumne Street to orient themselves in relation to specific stores within the Mall that are adjacent to these streets. Opening up the Mall to vehicular traffic would allow

motorist to have direct physical and visual access to the shops since the streets would allow access.

The Mall's pavement includes a paving pattern that resembles the contours of the natural landscape. However, the overall appearance of the Mall is that it is minimally maintained; the pavement is dirty, with numerous areas of food stains, discarded chewing gum, cigarette butts, and the pavement is cracked in many locations due. At the time the trees were planted, advanced planting techniques, such as structural pavement, drip irrigation, and root barriers were not prevalent, and therefore, tree roots have cracked the pavement in numerous locations.

Additionally, many planter walls and curbs are cracked, which decrease the quality of the visual environment, and generally give the Mall a visually unattractive appearance. The sculptures and fountains provide unique elements to the Mall; however, some sculptures have been vandalized and others are not prominently displayed or identified.

Additionally, some of the 21 fountains have been vandalized, and 14 of the 21 existing fountains have not been operable for years. Plaster is cracked, and the pumps and/or lighting are inoperable and have become repositories for debris, discarded bits of food, and cigarette butts.

Due to the ground floor vacancies within the Fulton Mall, which is approximately 26 percent, many of the businesses have industrial-looking metal gates that extend across the storefront indicating that the building space is vacant and abandoned. The gates are used to deter vandalism; however they also detract from the overall visual environment of the Mall.

In addition, there are vacant storefronts that have numerous haphazardly placed flyers, various advertisements, and other posted materials that are attached to their frontage which further degrades the visual experience of visiting the Mall. Although the 144 trees in the Mall provide a visual amenity, the presence of the inoperable fountains that are used as repositories for trash, in addition to dirty and broken sidewalks, metal security gates and numerous flyers at the vacant storefronts greatly reduce the visual quality of the mall.

3.3 Landscape Assessment Unit

To provide a framework for understanding and disclosing the potential visual effect of project alternatives, the FHWA visual methodology recommends the landscape be divided into sub-units for further analysis. Landscape Assessment Units are based on distinct areas or zones, which have certain common characteristics. Since the proposed Fulton Mall Reconstruction project is located in an urban setting that has similar features throughout the Mall and has limited views beyond the Mall, the project is identified as one Landscape Assessment Unit where views from

the Unit as well as views of the Unit are primarily limited to foreground and middle ground views within the malls. There are limited background views from the Mall and these view locations are near the edges of the Mall. This Landscape Assessment Unit is identified as Fulton Mall - Urban/Built. Appendix A includes the Landscape Unit Checklist that identifies the visual resource components of Visual Information and Visual Character for the Fulton Mall - Urban/Built Landscape Assessment Unit. The Visual Information identifies the supply of the visual resource while the Visual Character identifies the visual pattern of the elements and character.

4. Visual Assessment Methodology

This study uses an assessment model developed by the Federal Highway Administration (FHWA) Visual Impact Assessment for Highway Projects. The major components of this process include establishing the visual environment of the project, assessing the visual resources of the project area, and identifying viewer response to those resources. Those components define the existing conditions. Resource change introduced by the project and the associated viewer response is then assessed, providing a basis for determination of potential visual impacts. Assessing visual impacts is a function evaluating the extent of physical change (resources change), and comparing that with the degree of viewer sensitivity (viewer response). A generalized visual impact assessment process is as follows:

Resource Change + Viewer Response = Visual Impact

4.1 Viewer Resource Change

The physical changes caused by the project would be noticeable in terms of form, line, color, and texture, as well as scale, dominance, diversity, and continuity. These inherent physical attributes are visually experienced as an integrated whole, defining the perceived visual character of the landscape. The relationship of these attributes to one another and their setting is assessed in part by analyzing the view's vividness, intactness, and unity as defined in the FHWA methodology guidance. These three visual rating criteria are as follows:

Vividness is the visual power or memorability of the landscape components as they combine in striking and distinctive visual patterns.

Intactness is the visual integrity of the landscape and its freedom from non-typical encroaching elements. If all of the various elements of a landscape seem to "belong" together, there will be a high level of intactness.

Unity is the visual harmony of the landscape considered as a whole. Unity represents the degree to which potentially diverse visual elements maintain a coherent visual pattern.

To assess the degree of resource change caused by the project, the FHWA method recommends a numerical rating process, which compares the visual quality in terms of vividness, intactness, and unity of both the existing and proposed conditions for each project alternative under consideration. Ratings were conducted utilizing photographs and photo-simulations.

Separate Resource Change evaluations were conducted from each of the three Key Observation Points. A numerical rating between 1 and 7 was assigned for the visual quality of the existing

conditions from each viewpoint, with 1 having the lowest value and 7 the highest. Photographic simulations were then prepared illustrating the likely appearance of each view after project implementation. Based on the photographic simulation and field reviews, numerical ratings were then assigned to each of the proposed views. The numerical difference, if any, between the existing and proposed conditions quantifies the degree of resource change, which may occur as a result of the proposed project.

The Resource Change evaluation determines which specific criteria contribute most to the existing quality of each view, and if change would occur to that criteria as a result of the project. If a numerical change in visual criteria was identified, this change was analyzed for its potential affect on the existing visual quality.

Ultimately, the degree of resource change, as determined by the Resource Change evaluation, must be combined with the anticipated viewer response in order to understand and determine potential levels of visual impact.

4.2 Viewer Response

To understand and predict viewer response to the appearance of a roadway project, information must be known about the viewers who may see the project and the aspects of the visual environment to which they are likely to respond. The major viewer groups can be differentiated by physical factors that modify perception. For the proposed project, there is a basic distinction of the views from the existing roads that cross Fulton Mall, views of Fulton Mall, the physical location of each viewer group, the number of people in each group, and the duration of their view. The receptivity of different viewer groups to the visual environment is not equal. This variable receptivity is defined as viewer sensitivity and is strongly related to visual preference. It modifies visual experience directly by means of viewer activity and awareness. Indirectly, sensitivity modifies experience by means of values, opinions, and preconceptions.

Within the project area, the extent and characteristics of potential viewer groups are few. Viewer groups that would see the project include motorists, bicyclists, pedestrians/shoppers, and retail/office workers.

Motorists would have limited views of the project due to short (low) duration of their views as they drive past the connections of Fulton Mall on the existing streets. The general speeds on the existing streets within the project vicinity are 30 miles per hour. Once the motorists park their vehicles, they exit their vehicle and become pedestrians/shoppers, or retail/office workers. Pedestrians/shoppers within Fulton Mall pass through much slower than motorists and have a

longer (high) duration of views while retail/office workers within Fulton Mall pass through much slower than motorists and have a longer (moderately high) duration of the views.

Bicyclists would have moderately extended views of the project as they moved through the Mall. This group of viewers will be affected because of their duration of views of the Mall. Bicyclists are currently allowed to ride their bikes within the Mall. With the project, the bicyclists will be allowed to ride along the streets similar to other streets within downtown Fresno. Bike racks are currently provided within the Mall and will be provided with the project. The viewer sensitivity for this group is moderately high.

Pedestrians/Shoppers include visitors who are pedestrians using the Mall to recreate or shop. This group includes those who park their cars on the street or within garage structures and walk to the Mall, walk to the Mall from their residence, or walk to the Mall from public transportation. This group is the primary group of affected viewers because of their long duration of views of the Mall. The viewer sensitivity for this group is moderately high.

Retail/Office Workers include the employers and employees of the retail stores and offices within Fulton Mall. The majority of these users park their cars in the surface or structured parking areas in the vicinity of Fulton Mall or ride public transportation and walk to their destination. As they walk to their destination, they have extended views of Fulton Mall. Since the workers' primary purpose within the Mall is to walk to their place of work, their view sensitivity is considered average.

The viewer response by these groups include the quantity of viewers (i.e., number of viewers), their sensitivity to change, and their duration of their view. A driver passing through the project vicinity at 30 miles per hour would not be as sensitive to changes in the visual environment as a pedestrian walking through the environment. Visual sensitivity means how sensitive users are to changes. A very low, low, and a moderately low rating means that the project would not contrast with the visual quality of the existing environment. An average rating means that the project would have some contrast with the visual quality of the existing environment. A very high, high, and moderately high rating means that the project would contrast with the visual quality of the existing environment. Table 1 provides a summary of the viewer groups and their responses.

Table 1: Viewer Group Response

Viewer Group Response				
Viewer Group	**Quantity**	**Sensitivity**	**Duration**	**Viewer Response**
Motorists	Low	Low	Low	Low
Bicyclists	Low	Moderately High	Moderately High	Moderately High
Pedestrians/Shoppers	Very High	Moderately High	High	High
Retail/Commercial Workers	Low	Moderately Low	Moderately High	Moderately Low

This study considers and identifies these viewer modifiers for each of the three viewpoints. A numerical viewer response rating between 1 and 7 was assigned for each viewpoint, with 1 being the least sensitive anticipated response and 7 being the most sensitive anticipated response. Indetermining the potential levels of visual impact, the anticipated viewer response is combined with the degree of resource change.

4.3 Photographic Simulations and Project Representations

Photographic simulations illustrate the visual character from each of the Key Observation Points and provide an overview of the visual setting of the project area. For each Key Observation Point, the existing image shows how the view looked at the time of the study, and the proposed simulation represents how that location might appear with the particular alternative in place. The known dimensions of existing onsite elements were used as visual scale references to increase accuracy of the photographic simulations. For the purpose of this study, the new landscaping in the photographic simulations show plant growth at approximately 5 to 7 years after project construction.

This analysis represents the basic location, mass, and scale of the proposed elements. For project features not specifically defined by design at this time, the study assumes a “reasonable worst case” scenario. Where specifically proposed, landscaping and aesthetic treatments are shown in the photographic simulations.

5. Visual Impact Assessment

The following section contains the numerical ratings assigned to the existing and proposed views as seen from each of the Key Observation Points, along with a brief explanation of the rating numbers. Photographs of the existing conditions along with photographic simulations of the project are included to provide a basis for understanding the visual change proposed by the project.

The project is analyzed in terms of the numerical difference in physical change (Visual Quality Evaluation) combined with the expected sensitivities and responses of potential viewer groups (Viewer Response rating). The Visual Quality Evaluation rating (see Appendix B) is combined with the Viewer Response rating, with the results providing the basis for understanding and determining the type and extent of potential visual impacts.

The Visual Impact Rating and analysis is conducted for each of the three Key Observation Points (Figure 3). A separate table is provided for each build alternative (Alternatives 1 and 2). The Resource Change rating has been identified as either a positive or negative numeral, depending

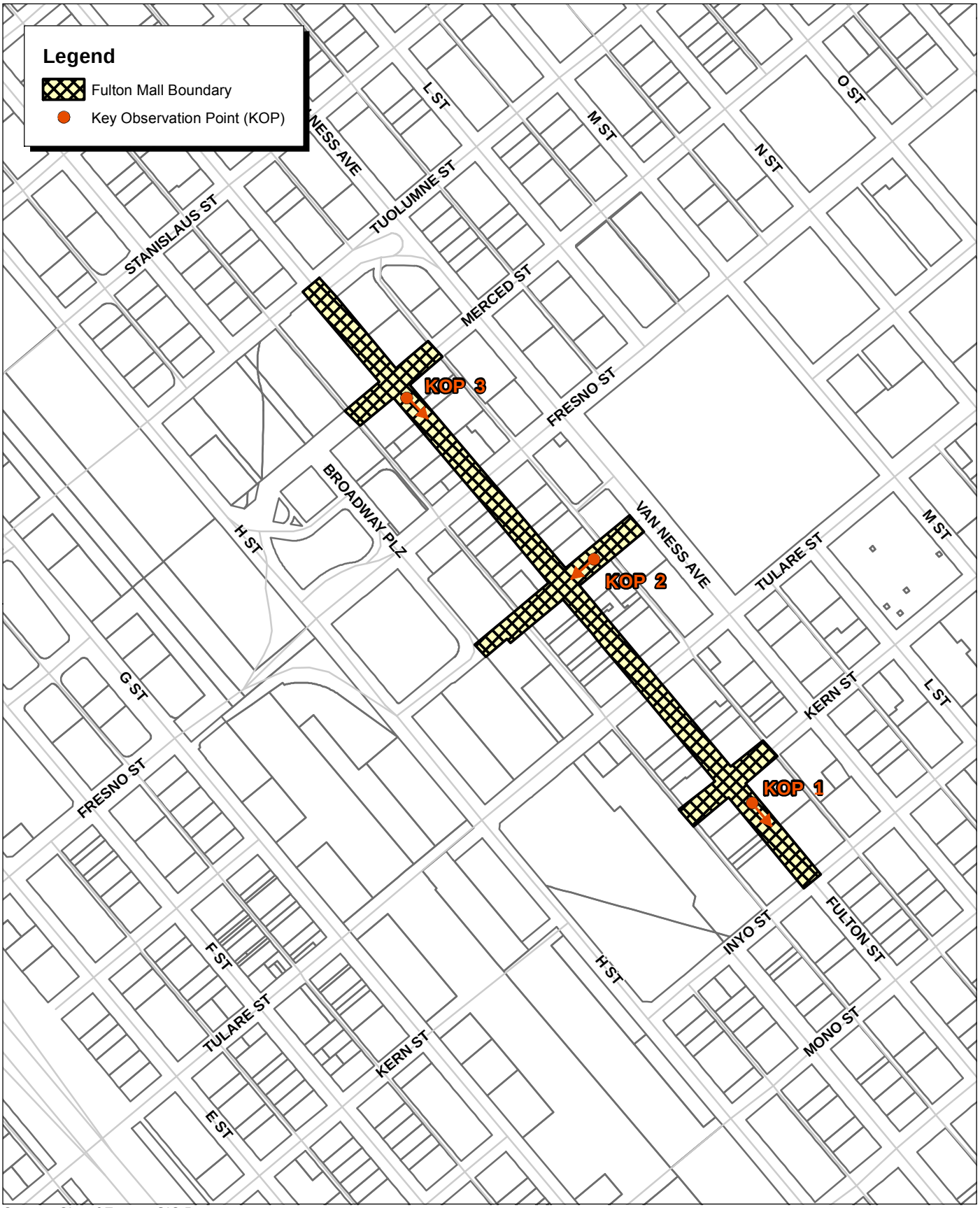
on whether the change is a positive or negative one. Viewer Response is always a positive number, which increases as the level of sensitivity and exposure increase. The Viewer Response serves as an amplifier of the resource change number. As a result, the Visual Impact Rating equation is determined by averaging the absolute value of the resource change number with the viewer response rating number, then applying either a positive or negative sign to the averaged number depending on whether the resource change was positive or negative.

Alternative 3 is the No Build Alternative and therefore, a visual evaluation is not warranted because there would be no change to the existing views.

5.1 Key Observation Point 1

Existing Conditions

The existing southern view of Fulton Mall south of Kern Mall is primarily limited to foreground and middle ground views of various visual resources (Figure 4). These resources include mature trees, patterned pavement, artwork, benches, light stands, and flower pots. The landform from this viewpoint is considered to have moderately low vividness due to its relatively flat terrain; however, the irregularly shaped ornamental pine tree in the foreground is considered to have a moderately high vividness due to its unique trunk structure.



Source: City of Fresno GIS Data.

Michael Brandman Associates

NORTH

500 250 0 500 Feet

Figure 3
Key Observation Points

Michael Brandman Associates

31680017 • 07/2013 | 4_existing_view_KOP1.cdr

Figure 4
Existing View at Key Observation Point 1

CITY OF FRESNO • FULTON MALL PROJECT
VISUAL IMPACT ASSESSMENT

The manmade features within the pedestrian mall provided in this view are considered to have a low level of vividness because they appear to have an overall low level of maintenace or upkeep which has resulted in dirty pavements, inoperable and broken concrete fountains, vacant shops, and flyers haphazardly posted at storefronts and lightpoles. The view from this location outside the right-of-way is only applicable to the nominal vegetation in the middle ground near Inyo Street and the buildings that border the Mall. The vegetation and the buildings provide very low to moderately low vividness view from this viewpoint. Overall, the view from this viewpoint of inside and outside of the right-of-way provides low vividness.

This view has some visual encroachments or eyesores including pavement that is dirty, contains chewing gum and is cracked in various locations. This view also includes flyers in the building windows as well as on the utility poles that are visible in the background view. Overall, the intactness is moderately low.

The unity between natural (trees and vegetation) and manmade as well as the overall unity is considered low due to the low visual harmony that this view provides.

Overall, the visual quality that this view provides is low.

Viewer Response

From Key Observation Point 1, the presence of the artwork, vegetation, and the pavement design provide a unique visual experience compared to some of the other areas within the downtown area. The viewers from this location are currently pedestrians/shoppers, bicyclists, and retail/office workers. Under Alternatives 1 and 2, motorists would be added as a viewer from this location. The pedestrians/shoppers have a relatively lengthy duration of the views. The expected viewer sensitivity rating from this viewpoint is identified as moderately high.

Proposed Condition - Alternative 1

This alternative includes construction of a two-lane street with parallel parking on both sides of the street, and includes approximately 20-foot wide sidewalks with various features (Figure 5). From this viewpoint, the visual features within the sidewalk area would include benches, artwork, trees, and patterned pavement. This viewpoint also illustrates a mid-block crosswalk. This proposed view provides foreground, middle ground, and background views.

Michael Brandman Associates

31680017 • 07/2013 | 5_visual_sim_KOP1_for_alt1.cdr

Figure 5
Visual Simulation at Key Observation Point 1 for Alternative 1

The landform from this viewpoint is considered to have an average level of vividness based on the proposed sidewalk, curb, gutter, and street features. The ornamental trees that are proposed along the road are considered to have moderately high vividness due to their visual pattern. The manmade features within the pedestrian mall provided in this view such as the street, sidewalk pavement, and artwork are considered to provide moderately high vividness while the features outside of the right-of-way such as storefronts as well as the background view of Fulton Street, south of Inyo Street,have average to moderately high vividness. Overall, the view from this viewpoint of inside and outside the right-of-way provides average vividness.

This view has few visual encroachments. Encroachments include the contrast of the sidewalk pavement as well as the marked parallel parking spaces along Fulton Street. Outside of the right-of-way, the adjacent buildings do not have any visual encroachments while the background view south of Inyo Street includes a few utility poles. The overall intactness from this view is moderately high.

The unity between natural (trees and vegetation) and manmade is considered to be moderately high with the built environment being the dominant view. Overall, the unity is moderately high due to the visual harmony of the view established by the proposed tree pattern.

Overall, the visual quality that this view provides is moderately high. Table 2 provides the quantitative comparison between the existing condition and Alternative 1.

Table 2: Visual Impact Assessment for Key Observation Point 1 - Alternative 1

Resource Change (RC) Evaluation				
Description	**Vividness (V)**	**Intactness (I)**	**Unity (U)**	**(=V+I+U/3)**
Existing	2.56	3.67	2.33	2.85
Proposed Alternative 1	4.56	5.17	5.00	4.91
Resource Change (RC) (Visual Quality Difference)				+2.06

Viewer Response (VR) Rating	
Viewer Response (VR)	5.00

Viewer Impact (VI) Rating	
Resource Change (RC)	2.06
Viewer Response (VR)	5.00
Visual Impact Formula: [(Absolute value of RC) + VR] / 2 With plus or minus sign applied to the result depending on whether the resource change (RC) value is positive or negative.	**+3.53**

As shown in Table 2, the overall existing visual quality at the Key Observation Point 1 would increase with the development of Alternative 1. This increase in visual quality would primarily occur due to the increase in the visual integrity, reduction of visual encroachments (such as dirty and cracked pavement, and flyers in the building windows). and establishment of a visual pattern with the proposed trees. The character of the view would improve with the addition of the proposed street and its features.

Proposed Condition Alternative 2

This alternative includes construction of a two-lane street with vignettes that consists of the street on one side of the right-of-way to provide larger areas for sidewalks, vegetation, and artwork (Figure 6). Portions of the vignettes will include parallel parking on one side of the street. From this viewpoint, the visual features within the non-street portion includes benches, artwork, trees, potted plants, grass near some water features, and patterned pavement. This viewpoint also illustrates a mid-block crosswalk.

This proposed view provides foreground, middle ground, and background views. The landform from this viewpoint is moderately high due to the slight elevation variation of the grass area and the street. The asymmetrically shaped ornamental pine tree in the foreground is considered to have high vividness due to its unique trunk structure and the level of importance of the tree that is created from the establishment of the roadway. The manmade features within the pedestrian mall provided in this view are considered to have very high vividness because the street and sidewalk pavement are clean and retain the patterns of the original mall pavement. The manmade features outside of the right-of-way provide views with moderately high vividness because the building structures will have increased maintenance as shoppers and retail revenues increase and vacancies decrease within the mall. Overall, the view from this viewpoint of inside and outside of the right-of-way provides moderately high vividness.

This view has few visual encroachments or eyesores. These include the limited contrast of the pavement and the mid-block crosswalk along Fulton Street. The overall intactness from this view is considered moderately high.

The unity between natural (trees and vegetation) and manmade is considered to be moderately high and the overall unity is also considered to be moderately high due to the coherent visual pattern that is established with the proposed improvements.

Overall, the visual quality that this view provides is moderately high. Table 3 provides the quantitative comparison between the existing condition and Alternative 2.

Figure 6
Visual Simulation at Key Observation Point 1 for Alternative 2

Michael Brandman Associates

31680017 • 07/2013 | 6_visual_sim_KOP1_for_alt2.cdr

Table 3: Visual Impact Assessment for Key Observation Point 1 - Alternative 2

Resource Change (RC) Evaluation				
Description	**Vividness (V)**	**Intactness (I)**	**Unity (U)**	**(=V+I+U/3)**
Existing	2.56	3.67	2.33	2.85
Proposed Alternative 2	5.33	5.33	5.33	5.33
Resource Change (RC) (Visual Quality Difference)				+2.48

Viewer Response (VR) Rating	
Viewer Response (VR)	5.00

Viewer Impact (VI) Rating	
Resource Change (RC)	2.48
Viewer Response (VR)	5.00
Visual Impact Formula: [(Absolute value of RC) + VR] / 2 With plus or minus sign applied to the result depending on whether the resource change (RC) value is positive or negative.	+3.74

As shown in Table 3, the overall existing visual quality at the Key Observation Point 1 would increase with the development of Alternative 2. This increase in visual quality would occur due to a substantial increase in the vividness, intactness, and unity of the view. The presence of the narrow road as well as a similar paving pattern in the road provides distinct viewing components and could lead the viewers to provide a more focused view of the natural and manmade elements adjacent to the proposed road. The presence of the proposed road will not substantially alter the character of the existing view. The character of the view would improve with the addition of the proposed street and the retention of existing natural and manmade features.

5.2 Key Observation Point 2

Existing Conditions

The existing western view of the intersection of the Fulton Mall and Mariposa Mall from east of Fulton Mall is dominated by the 60-foot “Clock Tower” (Figure 7). The resources included in this view are mature trees, patterned pavement, a bronze sculpture “La Grand Laveuse (Washer Woman)” by world renown Pierre Auguste Renoir, benches, light stands, and flower pots. The landform from this viewpoint is considered moderately low vividness due to its relatively flat terrain.

The ornamental trees and vegetation in the foreground and background are considered to have a moderately high vividness due to the amount of vegetation in this view. The manmade features which are dominated by the existing "Clock Tower" has moderately high vividness due to the Clock Tower's unique design and height, but it is weathered and not maintained in good condition. The view from this location outside the right-of-way is only applicable to the area southwest of Fulton Street and Mariposa Street and there are no views outside of the Fulton Mall - Urban/Built Landscape Unit.

The area southwest of Fulton and Mariposa includes a stage located adjacent to an existing building and includes various ornamental trees. This stage is located on a parcel that is currently owned by the City of Fresno and is used for various events throughout the year such as the annual Ice Rink, Fiestas Patrias (Mexican Independence Day) celebration, Cinco de Mayo, and the Catacomb Party music and art festival. From this view location, this area outside of the right-of-way as well as the structures that are adjacent to the mall, including the Pacific Southwest Building constructed in 1925, have moderately high vividness while the vegetation, which does not appear to be well maintained, has moderately low vividness. Overall, the view from this viewpoint of inside and outside of the right-of-way provides moderately low vividness.

This view has visual encroachments or eyesores including posters haphazardly taped on the light poles, dirty and cracked pavement, as well as the random location of the flowerpots that are regularly maintained within the right-of-way. The area outside of the right-of-way includes a trash enclosure that is visually intrusive due to the contrasting color of the trash enclosure with the surrounding vegetation. Overall, this view has an average level of intactness.

The unity between natural (trees and vegetation) and manmade features is considered moderately high within the right-of-way due to the visual pattern. Outside of the right-of-way, the unity is considered average. Overall, this view provides an average unifying view.

Based on the vividness, intactness, and unity qualities of this view, the visual quality that this view provides is average.

Viewer Response

From Key Observation Point 2, the presence of the "Clock Tower," vegetation, pavement design, and the adjacent buildings provide a unique visual experience. The viewers from this location are currently pedestrians/shoppers, bicyclists, and retail/office workers. Under Alternatives 1 and 2, motorists would be added as viewers from this location. The pedestrians/shoppers have a relatively lengthy duration of the views. The expected viewer sensitivity rating from this viewpoint is identified as high.

Proposed Condition Alternative 1

This alternative includes construction of two lane streets along Fulton Street and Mariposa Street with pedestrian bulb-outs and crosswalks at each of the four corners of the intersection (Figure 8). Parallel parking on both sides of Fulton Street and Mariposa Street will be provided. The "Clock Tower" will be refurbished and relocated to the southwest corner of the intersection.Sidewalks will be approximately 20 feet wide and have trees, seating, sculptures, and patterned pavement.

The landform from this viewpoint is considered to have low vividness due to its relatively flat terrain. The ornamental trees and vegetation in the foreground, middle ground, and background are considered to have a high vividness due to the number of trees which provide a leafy canopy. The manmade features include a Clock Tower, sculptures, patterned pavement on the sidewalk, street, and crosswalks and are considered to provide moderately high vividness. The view from this location outside the right-of-way is only applicable to the area southwest of the two malls and there are no views outside of the Fulton Mall - Urban/Built Landscape Unit.

The area southwest of Fulton Street and Mariposa Street includes a stage located adjacent to an existing building and includes various ornamental trees. From this view location, this area outside of the right-of-way as well as the structures that are adjacent to the mall, including the Pacific Southwest Building constructed in 1925, have moderately high vividness while the vegetation has moderately low vividness. Overall, the view from this viewpoint of inside and outside of the right-of-way provides average vividness.

This view has few visual encroachments or eyesores. These eyesores include the contrast of the pavement and the crosswalk as well as the marked parallel parking spaces along Fulton Street and Mariposa Street. The overall intactness from this view is moderately high.

The unity between natural (trees and vegetation) and manmade features is considered to be high within the right-of-way due to the visual integrity of the view and average outside of the right-of-way. The overall unity from this viewpoint is moderately high. Based on the above evaluation, the overall visual quality that this view provides is average. Table 4 provides the quantitative comparison between the existing condition and Alternative 1.

Michael Brandman Associates

31680017 • 07/2013 | 7_existing_view_KOP2.cdr

Figure 7
Existing View at Key Observation Point 2

CITY OF FRESNO • FULTON MALL PROJECT
VISUAL IMPACT ASSESSMENT

Michael Brandman Associates

31680017 • 07/2013 | 8_visual_sim_KOP2_alt1.cdr

Figure 8
Visual Simulation at Key Observation Point 2 for Alternative 1

Table 4: Visual Impact Assessment for Key Observation Point 2 - Alternative 1

Resource Change (RC) Evaluation				
Description	**Vividness (V)**	**Intactness (I)**	**Unity (U)**	**(=V+I+U/3)**
Existing	3.84	4.50	4.50	4.28
Proposed Alternative 1	4.00	5.50	5.00	4.83
Resource Change (RC) (Visual Quality Difference)				+0.55

Viewer Response (VR) Rating	
Viewer Response (VR)	6.00

Viewer Impact (VI) Rating	
Resource Change (RC)	+0.55
Viewer Response (VR)	6.00
Visual Impact Formula: [(Absolute value of RC) + VR] / 2 With plus or minus sign applied to the result depending on whether the resource change (RC) value is positive or negative.	+3.28

As shown in Table 4, the overall existing visual quality at the Key Observation Point 2 would increase with the development of Alternative 1. This increase in visual quality would primarily occur due to an increase in the intactness of the view by eliminating the dirty and cracked pavement as well as the unification of the visual pattern of the mall features. The presence of the road does not substantially alter the character of the existing view.

Proposed Condition Alternative 2

This alternative includes construction of two lane streets that converge into a roundabout at the intersection of Fulton Street and Mariposa Street (Figure 9). The intersection will include pedestrian bulb-outs and crosswalks at each of the four corners. Parallel parking on both sides of Fulton Street and Mariposa Street will be provided. The “Clock Tower” will remain at the center of the roundabout making it a visual focus for pedestrians and motorists. The “Clock Tower” is planned to be raised approximately 2 to 3 feet in height onto a base that includes a planter. Sidewalks will be approximately 20 feet wide with trees, artwork, and patterned pavement.

The landform from this viewpoint is considered to have low vividness due to its relatively flat terrain. The proposed ornamental trees and vegetation within the right-of-way would have high vividness while the trees outside of the right-of-way would have moderately low vividness. The

manmade features include the Clock Tower, artwork, pattern pavement on the sidewalk, street, and crosswalks would be considered to provide very high vividness due to the Clock Tower's unique design and height as well as making it a focal point in the street design. The manmade features outside of the right-of-way includes the structures adjacent to the mall, including the Pacific Southwest Building constructed in 1925, have moderately high vividness. Overall, the view of inside and outside the right-of-way from this viewpoint has average vividness.

This view has no visual encroachments within the right-of-way. The overall intactness from this view would be high due to the improvement of visual integrity by isolating the Clock Tower in the middle of the intersection.

The unity between natural (trees and vegetation) and manmade features within the right-of-way is considered to be high because this view provides visual harmony while the unity outside of the right-of-way provides average unity. Overall, the unity is moderately high from this viewpoint.

Based on the above evaluation, the overall visual quality that this view provides is moderately high. Table 5 provides the quantitative comparison between the existing condition and Alternative 2.

Table 5: Visual Impact Assessment for Key Observation Point 2 - Alternative 2

Resource Change (RC) Evaluation				
Description	**Vividness (V)**	**Intactness (I)**	**Unity (U)**	**(=V+I+U/3)**
Existing	3.84	4.50	4.50	4.28
Proposed Alternative 2	4.33	6.00	5.00	5.11
Resource Change (RC) (Visual Quality Difference)				+0.83

Viewer Response (VR) Rating	
Viewer Response (VR)	6.00

Viewer Impact (VI) Rating	
Resource Change (RC)	0.83
Viewer Response (VR)	6.00
Visual Impact Formula: [(Absolute value of RC) + VR] / 2 With plus or minus sign applied to the result depending on whether the resource change (RC) value is positive or negative.	+3.42

Michael Brandman Associates

31680017 • 07/2013 | 9_visual_sim_KOP2_alt2.cdr

Figure 9
Visual Simulation at Key Observation Point 2 for Alternative 2

As shown in Table 5, the overall existing visual quality at the Key Observation Point 2 would increase with the development of Alternative 2. This increase in visual quality would primarily occur due to the increase in intactness and unity by improving the visual integrity and harmony of the view.

5.3 Key Observation Point 3

Existing Conditions

The existing southern view of Fulton Mall south of Merced Mall is limited to foreground and middle ground views of various visual resources (Figure 10). These resources include the mature trees, shrubs, planters, patterned pavement, artwork, benches, light stands, and flower pots. The landform from this viewpoint has very low vividness due to its relatively flat terrain; however, the ornamental trees in the foreground and middle ground are considered to have moderately high vividness. The manmade features within the pedestrian mall provided in this view are considered to have low vividness because they do not appear to be well maintained and have dirty, stained, and broken or cracked pavement, benches, and planter areas.

The view from this location outside the right-of-way is only applicable to buildings that border the pedestrian mall. The buildings provide moderately high vividness from this viewpoint due to their unique architecture. Overall, the view from this viewpoint of inside and outside of the right-of-way provides moderately low vividness.

This view has several visual encroachments or eyesores that include posters on light poles, dirty and cracked pavement and benches and has moderately low intactness. Outside of the right-of-way, there are some visual encroachments from this viewpoint including the dirty and cracked pavement, benches and planters. This view is considered to have a moderately high intactness. Overall, the intactness of this view is average.

The unity between natural (trees and vegetation) and manmade features is considered moderately low because the features within the mall from this viewpoint do not appear to be well maintained. There is little visual harmony of this view.

Michael Brandman Associates

31680017 • 07/2013 | 10_existing_view_KOP3.cdr

Figure 10
Existing View at Key Observation Point 3

CITY OF FRESNO • FULTON MALL PROJECT
VISUAL IMPACT ASSESSMENT

Viewer Response

From Key Observation Point 3, the presence of the vegetation, the pavement design, and the adjacent buildings provide a unique visual experience; however, the noticeable stains on the pavement and seating area reduces the quality of the view. The viewers from this location are currently pedestrians/shoppers, bicyclists, and retail/office workers. Under Alternatives 1 and 2, motorists would be added as a viewer from this location. The pedestrians/shoppers have a relatively lengthy duration of the views. The expected viewer sensitivity rating from this viewpoint is identified as average.

Proposed Condition Alternative 1

This alternative includes construction of a two-lane street with parallel parking on both sides of the street, and includes approximately 20-foot wide sidewalks with various features to improve the shopping experience (Figure 11). From this viewpoint, the visual features within the sidewalk area includes light poles, artwork, trees, and patterned pavement. This viewpoint also illustrates a mid-block crosswalk. This proposed view provides foreground, middle ground, and limited and confined background views.

The landform from this viewpoint is considered to have low vividness due to its relatively flat terrain; however, the ornamental trees that are proposed along the road are considered to have high vividness due to their visual pattern. The features within the pedestrian mall provided in this view are considered to also have high vividness due to the distinctive patterns of the sidewalk pavement, artwork, and light poles. There are no available views from this location outside the right-of-way and outside the Fulton Mall - Urban/Built Landscape Unit.

Overall, the view from this viewpoint of inside and outside of the right-of-way provides moderately high vividness.

This view has few visual encroachments or eyesores. These eyesores include the contrast of the pavement and the mid-block crosswalk along Fulton Street. The overall intactness from this view is high. The unity between natural (trees and vegetation) and manmade is considered to be moderately high while the overall unity is also considered to be moderately high due to the visual pattern and harmony that is created under this alternative.

Overall, the visual quality that this view provides is moderately high. Table 6 provides the quantitative comparison between the existing condition and Alternative 1.

Michael Brandman Associates

31680017 • 07/2013 | 11_visual_sim_KOP3_alt1.cdr

Figure 11
Visual Simulation at Key Observation Point 3 for Alternative 1

Table 6: Visual Impact Assessment for Key Observation Point 3 - Alternative 1

Resource Change (RC) Evaluation				
Description	**Vividness (V)**	**Intactness (I)**	**Unity (U)**	**(=V+I+U/3)**
Existing	3.84	4.00	3.50	3.61
Proposed Alternative 1	5.34	6.50	4.50	5.47
Resource Change (RC) (Visual Quality Difference)				+1.19

Viewer Response (VR) Rating	
Viewer Response (VR)	4.00

Viewer Impact (VI) Rating	
Resource Change (RC)	1.19
Viewer Response (VR)	4.00
Visual Impact Formula: [(Absolute value of RC) + VR] / 2 With plus or minus sign applied to the result depending on whether the resource change (RC) value is positive or negative.	+2.60

As shown in Table 6, the overall existing visual quality at the Key Observation Point 3 would increase with the development of Alternative 1. This increase in visual quality would occur due to an increase in the vividness, intactness, and unity of the view. Each of these components of the visual quality substantially increase under Alternative 1 due to the provision of distinctive patterns, visual integrity, and visual harmony of the view with Alternative 1. The implementation of Alternative 1 would improve the current view of stained and cracked pavement, seating areas and planters.

Proposed Condition Alternative 2

This alternative includes construction of a two-lane street with vignettes. At this location, the vignette includes the roadway in the middle of the right-of-way and no parallel parking in the vignette area, but parallel parking is provided outside of the vignette area (Figure 12). The vignette allows for a larger area for sidewalks, vegetation, and artwork. From this viewpoint, the visual features within the sidewalk area includes light poles, artwork, trees, potted plants, and patterned pavement.

Figure 12
Visual Simulation at Key Observation Point 3 for Alternative 2

Michael Brandman Associates

31680017 • 07/2013 | 12_visual_sim_KOP3_alt2.cdr

This proposed view provides foreground, middle ground, and limited and confined background views. The landform from this viewpoint is considered to be low vividness due to its relatively flat terrain; however, the ornamental trees that are proposed along the road are considered to have moderately high vividness due to their visual pattern. The features proposed within the pedestrian mall provided in this view are considered to have high vividness due to the clean pavement and maintained street, sidewalk, lighting fixtures, and artwork. The view outside of the right-of-way includes the structures that are adjacent to the mall. An expected result of opening the mall to vehicular traffic is an increase in customers and retail sales. With an increase in sales, building owners or renters, may use the additional income to improve building exteriors, which would provide the opportunity for the storefronts to have a higher vividness. Overall, the view from this viewpoint of inside and outside of the right-of-way provides high vividness.

This view has few visual encroachments or eyesores under Alternative 2. One eyesore includes the contrast of the patterned pavement and the white stipes that illustrate the separation between the sidewalk and the roadway along Fulton Street (Figure 12). The intactness of the view outside of the right-of-way which includes the buildings is considered very high. The overall intactness from this view is high.

The unity between natural (trees and vegetation) and manmade features is considered to be high due to the visual harmony and coherent visual pattern created with the features that are proposed as part of Alternative 2. The overall unity is also considered to be moderately high.

Based on the above evaluation, the overall visual quality that this view provides is moderately high. Table 7 provides the quantitative comparison between the existing condition and Alternative 2.

Table 7: Visual Impact Assessment for Key Observation Point 3 - Alternative 2

Resource Change (RC) Evaluation				
Description	**Vividness (V)**	**Intactness (I)**	**Unity (U)**	**(=V+I+U/3)**
Existing	3.84	4.00	3.50	3.61
Proposed Alternative 2	5.84	6.50	5.00	5.78
Resource Change (RC) (Visual Quality Difference)				+2.17

Viewer Response (VR) Rating	
Viewer Response (VR)	4.00

Viewer Impact (VI) Rating	
Resource Change (RC)	2.17
Viewer Response (VR)	4.00
Visual Impact Formula: [(Absolute value of RC) + VR] / 2 With plus or minus sign applied to the result depending on whether the resource change (RC) value is positive or negative.	+3.09

As shown in Table 7, the overall existing visual quality at the Key Observation Point 3 would increase with the development of Alternative 2. This increase in visual quality would occur due to a substantial increase in the vividness, intactness, and unity of the view. Each of these components of the visual quality substantially increases under Alternative 1 due to the provision of distinctive patterns, visual integrity, and visual harmony of the view with Alternative 2. The implementation of Alternative 2 would improve the current view of dirty, stained, and cracked pavement, benches and planter areas.

5.4 Summary of Visual Impacts

The implementation of Alternatives 1 and 2 will result in the alternation of the visual character of Fulton Mall. The visual quality of the views as well as the response of the viewers were evaluated at three Key Observation Points along the project area. Based on the evaluation provided above, Alternatives 1 and 2 will result in positive visual changes with the reconstruction of Fulton Mall. However, until the proposed newly planted trees reach maturity and provide shade and increased visual appeal, the removal of the mature trees will have a temporary substantial negative visual impact.

Alternatives 1 and 2

Both alternatives will result in the removal of existing mature trees that are located throughout Fulton Mall. It is assumed that approximately four mature trees of the existing 144 trees within the Mall will remain under Alternatives 1 and approximately 30 mature trees within the vignette areas would remain under Alternative 2. Removal of trees will cause a temporary substantial negative visual impact. However, under both Alternatives 1 and 2, replacement trees will be planted within the Mall so that the total number of trees would be approximately 144 trees. The replacement trees that will be located within the sidewalk areas will include root barriers that will diminish future uneven pavement around the trees. Replacement trees will include varying sizes that range from 15-gallon to 36-inch box. Advanced planting techniques will ensure the trees will grow quickly to maturity and provide beauty and shade to Mall visitors.

Alternatives 1 and 2 will also result in the loss of the original patterned pavement of the Mall and replace it with an asphalt road in the middle of the Mall and new patterned pavement along the sidewalks as well as the vignette areas in Alternative 2. The new patterned pavement will replicate the original pavement to maintain the original design. The presence of the asphalt road will alter the views within the Mall. This visual alteration will be positive because both alternatives will replace the dirty, stained, and cracked pavement that decreases the visual quality of the Mall.

The planters throughout the Mall area are also assumed to be removed under Alternatives 1 and 2 and new planters will be constructed in the vignette areas under Alternative 2. The new planters will include new irrigation. Many of the existing planter walls and associated curbs are cracked and stained. The removal of the planters under Alternative 1 would improve the visual quality of the Mall. Under Alternative 2, the inclusion of new planters within the vignette areas will also improve the visual quality of the Mall under Alternative 2.

The existing sculptures will be temporarily removed during construction activities under Alternatives 1 and 2. Some of the existing sculptures have been vandalized. Alternative 1 includes refurbishing the 20 existing sculptures, placing them within the sidewalk areas of Fulton Mall, and prominently identifying them. The refurbishment of the sculptures will improve the visual quality of the Mall under Alternative 1.

Alternative 2 will also include refurbishing the 20 existing sculptures. Fourteen of the 20 sculptures would be returned to approximately the same location as they exist today. The remaining six sculptures would be returned to new locations within the Mall. Each of the sculptures would be prominently displayed and identified. The refurbishment of the sculptures will improve the visual quality of the Mall under Alternative 2.

Some of the existing fountains will be removed and others will remain during construction activities under both Alternatives 1 and 2. Fourteen of the existing 21 fountains are currently inoperable due to cracks, inoperable pumps, and/or electrical problems affecting the lighting. Many have become repositories for debris, discarded bits of food, and cigarette butts. Alternative 1 will retain the three fountains that are located on Kern Mall west of Fulton. These three fountains will be refurbished. Since many of the fountains are in disrepair, removal of them under Alternative 1 would improve the visual quality of the Mall.

Alternative 2 will retain 12 of the 21 fountains; three fountains on Kern Mall west of Fulton and nine fountains within the vignette areas. All 12 fountains will be refurbished or rebuilt. Retaining and refurbishing/rebuilding the fountains will improve the visual quality of the Mall under Alternative 2.

Under both Alternatives 1 and 2, long-term maintenance of the fountains will be provided by the City of Fresno. The City currently provides maintenance of the fountains; however, due to the number and age of the fountains, substantial funding has been needed. Under Alternatives 1 and 2, fewer fountains will be included in Fulton Mall, and the existing maintenance funding will be adequate to maintain the refurbished or rebuilt fountains.

There are various existing lighting fixtures throughout the Mall that are inoperable due to lack of maintenance. After dark, the Mall appears to be almost abandoned, since most of the retail stores throughout the Mall are closed in the evening due to the lack of customers and many of the stores are locked with metal gates to prevent burglaries and the lights are turned off. Therefore, in the evening, the Mall has a lack of proper lighting and the nighttime visual experience is of very low quality. Under Alternatives 1 and 2, the provision of streets within the Mall as well as parking near the retail stores will indirectly increase the number of shoppers in Fulton Mall, thereby increasing revenues, decreasing vacancies, and it would be expected that increased maintenance dollars would be available for upkeep of the Mall landscaping, lighting, and storefronts. New irrigation lines would be provided for landscaping within the Mall, and new electrical wiring would be provided for the light fixtures proposed in the Mall.

If sufficient nighttime lighting is provided, and stores remain open in the evenings, the opportunity for increased revenue is created. Therefore, the implementation of Alternatives 1 and 2 will substantially improve the nighttime visual quality of Fulton Mall. Although both Alternatives 1 and 2 will improve the visual quality of the Mall, Alternative 2 will result in a greater increase in the visual quality of the mall compared to Alternative 1. See Tables 2 through 7 to compare the overall higher rating at each Key Observation Point for visual quality improvement with Alternative 2. The higher rating for Alternative 2 is because the

implementation of this Alternative will include vignettes that allow for the proposed street to narrow and provide wider sidewalk areas to accommodate more existing Mall design elements compared to Alternative 1.

Additionally, the vignettes proposed for Alternative 2 will incorporate a greater amount of the existing patterned pavement within the Mall area compared to Alternative 1 because the patterned pavement would extend onto the surface of the street. The crosswalks within the vignette areas would include offset color concrete strips. The three Key Observation Points that are evaluated above include locations with special treatment areas. The special treatment areas under Alternative 2 are generally expected to provide a substantially greater visual quality than current conditions.

In the areas of Alternative 2 that will include improvements similar to Alternative 1, the visual quality of the views are expected to be increased compared to the existing conditions. The vignette areas of Alternative 2 would have a greater visual quality compared to Alternative 1.

The implementation of Alternative 3 (No Build Alternative) would retain the existing pedestrian Mall in its current state. The existing pavement, planters, sculptures, fountains, seating areas, other artwork, and lighting that are in various states of disrepair are anticipated to continue to degrade due to lack of maintenance and vandalism thus resulting in the further adverse visual quality of existing views within Fulton Mall. Maintaining status quo may indirectly reduce the number of shoppers and retail revenues. A reduction in retail revenue may result in additional retail store vacancies, and continued degradation of the views within the Mall. The mature trees, although not regularly maintained, would remain and continue to provide shade and visual relief from the minimally maintained storefronts along the Mall. Overall, Alternative 3 will continue to adversely affect the visual environment and with the passage of time, further reduce the quality of the existing views within the Mall.

6. Recommended Mitigation and Minimization Measures

Following are the recommended mitigation and minimization measures to reduce potential visual impacts associated with Alternatives 1 and 2. The first set of mitigation measures are recommended for both Alternatives 1 and 2. The second set of mitigation measures are recommended for Alternative 2 only. No mitigation and minimization measures are recommended for the No Build alternative (Alternative 3).

Alternatives 1 and 2

1. All crosswalks within the project area shall not use typical white wide hatched lines, but shall include offset color concrete strips similar to other intersections in the vicinity of Fulton Mall such as Kern Street/Van Ness Avenue, Kern Street/L Street, and Inyo Street/Van Ness Avenue.

2. Drainage structures such as inlets within the sidewalk areas and the face of the curbs shall be designed to visibly blend-in with the color and tone of the setting.

3. Trees that are removed shall be replaced with a new tree at a 1:1 ratio within the Fulton Mall right-of- way. The replacement trees shall be consistent with the landscape palette and design provided in the Fulton Corridor Specific Plan.

4. Replacement trees to be planted shall be of varying sizes that range from 15 gallon to 36-inch box. Each replacement tree shall have root barriers to prevent sidewalk upheaval from roots.

5. Trash receptacles shall blend in with the landscape by including an exterior color that is similar to the patterned pavement of the sidewalk.

Alternative 1

6. All 20 sculptures would be removed during construction activities. Prior to returning the sculptures, they shall be refurbished, and then located in prominent viewable areas within the Mall.

Alternative 2

7. Subsequent to removal of all 20 sculptures during construction activities, 14 of the 20 sculptures shall be returned to their approximate current location. The six remaining sculptures shall be return to a new location within the Mall. Prior to returning the

sculptures, they shall be refurbished and then located in prominent viewable areas within the Mall.

8. The roadway pavement within the vignette areas shall include integrally colored concrete with a similar tone as the proposed sidewalk.

9. The new location of the Clock Tower is planned in the center of the proposed roundabout at the intersection of Fulton Street and Mariposa Street. To increase the visual prominence of this feature, it is recommended that the Clock Tower be raised approximately 2 to 3 feet in height onto a base that includes a planter. The planter will require irrigation lines and maintenance of the planter base and the vegetation within the planter will be provided by the City of Fresno. To ensure safety of maintenance workers, the planter base shall be designed with a raised step around the planter. The size of the base shall be determined by the City of Fresno based on the lane width requirements of the roundabout. The material that is used for the base shall be determined by the City of Fresno and the color and tone of the material shall be consistent with the color of the patterned pavement on the sidewalk. Raising the Clock Tower feature will also reduce the potential for motorist accidentally hitting the Clock Tower.

7. References

California Department of Transportation. 2013. Standard Environmental Reference. Chapter 27, Visual & Aesthetics Review.

Site Visit. April 2013. FirstCarbon Solutions.

U.S. Department of Transportation, Federal Highway Administration. 1988. Visual Impact Assessment for Highway Projects (FHWA-HI-88-054).

Visual Simulations. July 2013. Susanne Bertz-Rosa, Bertz-Rosa Strategy and Creative.

8. Appendices

A - Landscape Unit Checklist

B - Visual Quality Evaluation

Appendix A - Landscape Unit Checklist

Landscape Unit Checklist: Visual Inventory and Analysis

Project Name	Fresno Fulton Mall	**Evaluator**	Houlihan
S.R. Number		**Date**	April 13, 2013
Assessment Unit	Fulton Mall - Urban Built	**Weather**	Clear
L/F District			
L/F Section			
L/F Province			

Visual Information (Perception		Visual Character (Cognition)			
Resource Supply		Pattern Elements		Pattern Character	
3	High Prominence	3	High Prominence	3	High Prominence
2	Moderate Prominence	2	Moderate Prominence	2	Moderate Prominence
1	Present	1	Present	1	Present
0	Absent	0	Absent	0	Absent

Landform

0	Mountains	3	Form	3	Dominance of Landforms
0	Steep Hills/Ridges	3	Line	2	Scale of Landforms
0	Rolling Hills	3	Color	2	Diversity of Landforms
0	Undulating Land	3	Texture	1	Continuity of Landform Pattern
0	Plateaus/Plains				
0	Valleys				
0	Cliffs, Bluffs				
0	Points				
0	Beaches				

Land Cover (Water)

0	Bays/Inlets	0	Form	0	Dominance of Waterforms
0	Rivers	0	Line	0	Scale of Waterforms
0	Streams	0	Color	0	Diversity of Waterforms
0	Lakes	0	Texture	0	Continuity of Waterform Pattern
0	Ponds				
0	Marshes				
0	Waterfalls/Rapids				

Land Cover (Vegetation)

0	Coniferous Woods	2	Form	2	Dominance of Vegetation
0	Deciduous Woods	2	Line	2	Scale of Vegetation
0	Scrubland	2	Color	1	Diversity of Vegetation
0	Grassland	2	Texture	1	Continuity of Vegetation Pattern
0	Pasture/Croplands				
0	Parks/Lawns				
0	Street Trees				
0	Agriculture				

Appendix B - Visual Quality Evaluation

Visual Quality Evaluation - Evaluation Scale
Fulton Mall Reconstruction

The evaluation scale for each of the components of the visual quality criteria is provided below.

Vividness Criteria - This criteria is based on the memorability of the visual impression received from contracting landscape elements as they combine to form a striking and distinctive visual pattern. This criteria includes Landform, Water, Vegetation, and Manmade Development. If one of the criteria is not present, it is considered not applicable.

Vividness Rating (for all criteria)

7	Very High
6	High
5	Moderately High
4	Average
3	Moderately Low
2	Low
1	Very Low

Intactness Criteria - This criteria is based on the integrity of the visual pattern and the extent to which the landscape is free from visual encroachment or eyesores. This criteria includes Absence of Encroachments and Overall Intactness. Following are the basis of the ratings.

Intactness Rating

Absence of Encroachments		Overall Intactness	
7	None	7	Very High
6	Few	6	High
5	Some	5	Moderately High
4	Average	4	Average
3	Several	3	Moderately Low
2	Many	2	Low
1	Very Many	1	Very Low

Unity Criteria - This criteria is based on the degree to which the visual resources of a landscape join together to form a coherent, harmonious visual pattern. This criteria includes Manmade/Natural Unity, which is the unity between manmade and natural elements and Overall Unity. If there are no manmade elements or natural elements associated with a view then the Manmade/Natural Unity criteria is not present, and it is considered not applicable.

<u>Unity Rating (for both criteria)</u>

7	Very High
6	High
5	Moderately High
4	Average
3	Moderately Low
2	Low
1	Very Low

VISUAL QUALITY EVALUATION - VIEW FROM THE ROAD - EXISTING CONDITIONS

VISUAL QUALITY EVALUTION – VIEW FROM THE ROAD

Project Fulton Mall Reconstruction
S.R. No.
V.R.M. Unit _____

Evaluator Mike Houlihan
Date July 3, 2013
Weather Clear

Evaluation Scale: 1-7
1 = Very Low
4 = Average
7 = Very High

Observer Viewpoint	VIEW: ZONE		VISUAL QUALITY: VIVIDNESS: CRITERIA: Landform	Water	Vegetation	Mannade Dev.	Vividness (1–7)	Overall Vividness	FEATURES	INTACTNESS: CRITERIA: Absence of Encroachment	Overall Intact.	Intactness (Av.: 1–7)	Overall Intactness	ENCROACHMENT	UNITY: CRITERIA: Man/Natural	Overall Unity	Unity (Av.: 1–7)	Overall Unity	Visual Quality (V + I + U) ÷ 3 (Overall Average)
1	Inside R.O.W.		3.00	NA	5.00	2.00	3.67	2.56	Mature trees are distinctive	5.00	2.00	3.50	3.67	Chewing gum, cracked pavement, posters on light poles	3.00	3.00	3.00	2.33	2.85
	O/S Row	I/S Unit	NA	NA	NA	3.00	3.00		Buildings	6.00	4.00	5.00		Flyers on windows	NA	2.00	2.00		
	O/S Row	O/S Unit	NA	NA	1.00	1.00	1.00		Vegetation, utility poles	3.00	2.00	2.50		Utility poles	2.00	2.00	2.00		
2	Inside R.O.W.		2.00	NA	5.00	5.00	4.00	3.84	Clock Tower, mature trees	4.00	4.00	4.00	4.50	Dirty and cracked pavement, posters on light poles	5.00	5.00	5.00	4.50	4.28
	O/S Row	I/S Unit	3.00	NA	3.00	5.00	3.67		Mature trees	5.00	5.00	5.00		Trash bin	4.00	4.00	4.00		
	O/S Row	O/S Unit	NA	NA	NA	NA	NA		NA	NA	NA	NA		NA	NA	NA	NA		
3	Inside R.O.W.		1.00	NA	5.00	2.00	2.67	3.84	Mature trees, stained pavement	3.00	3.00	5.00	4.00	Posters on light poles, dirty pavement	3.00	3.00	3.00	3.50	3.78
	O/S Row	I/S Unit	NA	NA	NA	5.00	5.00		Building Architecture	5.00	5.00	5.00		Low exterior maintenance	NA	4.00	4.00		
	O/S Row	O/S Unit	NA	NA	NA	NA	NA		NA	NA	NA	NA		NA	NA	NA	NA		

O/S R.O.W. = Outside R.O.W.
NA = Not Applicable

I/S Unit = Inside Landscape Unit
O/S Unit = Outside Landscape Unit

VISUAL QUALITY EVALUATION - VIEW FROM THE ROAD - PROPOSED ALTERNATIVE 1

VISUAL QUALITY EVALUTION – VIEW FROM THE ROAD

Project Fulton Mall Reconstruction
S.R. No.
V.R.M. Unit _____

Evaluator Mike Houlihan
Date July 3, 2013
Weather Clear

Evaluation Scale: 1-7
1 = Very Low
4 = Average
7 = Very High

Observer Viewpoint	VIEW: ZONE		VISUAL QUALITY: VIVIDNESS: CRITERIA: Landform	Water	Vegetation	Manmade Dev.	Vividness (1–7)	Overall Vividness	FEATURES	INTACTNESS: Absence of Encroachment	Overall Intact.	Intactness (Av.: 1–7)	Overall Intactness	ENCROACHMENT	UNITY: CRITERIA: Man/Natural	Overall Unity	Unity (Av.: 1–7)	Overall Unity	Visual Quality (V + I + U) ÷ 3 (Overall Average)
1	Inside R.O.W.		4.00	NA	5.00	5.00	4.67	4.56	Patterned trees, artwork, patterned pavement	6.00	6.00	6.00	5.17	Contrasting crosswalk	5.00	5.00	5.00	5.00	4.91
	O/S Row	I/S Unit	NA	NA	NA	4.00	4.00		Trees	7.00	5.00	6.00		None	NA	5.00	5.00		
	O/S Row	O/S Unit	NA	NA	5.00	5.00	5.00		Few trees, utility poles	3.00	4.00	3.50		Utility poles	5.00	5.00	5.00		
2	Inside R.O.W.		2.00	NA	6.00	5.00	4.33	4.00	Mature trees, artwork, Clock Tower	6.00	6.00	6.00	5.50	Contrasting crosswalk	6.00	6.00	6.00	5.00	4.83
	O/S Row	I/S Unit	3.00	NA	3.00	5.00	3.67		Mature trees	5.00	5.00	5.00		Trash bin	4.00	4.00	4.00		
	O/S Row	O/S Unit	NA	NA	NA	NA	NA		NA	NA	NA	NA		NA	NA	NA	NA		
3	Inside R.O.W.		2.00	NA	6.00	6.00	4.67	5.34	Trees, patterned pavement, artwork	6.00	6.00	6.00	6.50	Contrasting crosswalk	5.00	5.00	5.00	4.50	5.47
	O/S Row	I/S Unit	NA	NA	NA	6.00	6.00		Building architecture	7.00	7.00	7.00		None	NA	4.00	4.00		
	O/S Row	O/S Unit	NA	NA	NA	NA	NA		NA	NA	NA	NA		NA	NA	NA	NA		

O/S R.O.W. = Outside R.O.W.
NA = Not Applicable

I/S Unit = Inside Landscape Unit
O/S Unit = Outside Landscape Unit

VISUAL QUALITY EVALUATION - VIEW FROM THE ROAD - PROPOSED ALTERNATIVE 2

Project Fulton Mall Reconstruction
S.R. No.
V.R.M. Unit _____

Evaluator Mike Houlihan
Date July 3, 2013
Weather Clear

Evaluation Scale: 1-7
1 = Very Low
4 = Average
7 = Very High

Observer Viewpoint	VIEW: ZONE		VISUAL QUALITY: VIVIDNESS: CRITERIA: Landform	Water	Vegetation	Manmade Dev.	Vividness (1–7)	Overall Vividness	FEATURES	INTACTNESS: CRITERIA: Absence of Encroachment	Overall Intact.	Intactness (Av.: 1–7)	Overall Intactness	ENCROACHMENT	UNITY: CRITERIA: Man/Natural	Overall Unity	Unity (Av.: 1–7)	Overall Unity	Visual Quality (V + I + U) ÷ 3 (Overall Average)
1	Inside R.O.W.		5.00	NA	6.00	7.00	6.00	5.33	Accentuates the features	6.00	6.00	6.00	5.33	Contrasting crosswalk	6.00	6.00	6.00	5.33	5.33
	O/S Row	I/S Unit	NA	NA	NA	5.00	5.00		Buildings	7.00	6.00	6.50		None	NA	5.0	5.0		
	O/S Row	O/S Unit	NA	NA	5.00	5.00	5.00		Vegetation, utility poles	3.00	4.00	3.50		Utility poles	5.00	5.00	5.00		
2	Inside R.O.W.		2.00	NA	6.00	7.00	5.00	4.33	Clock tower, mature trees	7.00	7.00	7.00	6.00	Contrasting crosswalk	6.00	6.00	6.00	5.00	5.11
	O/S Row	I/S Unit	3.0	NA	3.0	5.00	3.67		Mature trees	5.00	5.00	5.00		Trash bin	4.00	4.00	4.00		
	O/S Row	O/S Unit	NA	NA	NA	NA	NA		NA	NA	NA	NA		NA	NA	NA	NA		
3	Inside R.O.W.		2.0	NA	6.00	6.00	4.60	5.84	Mature trees, artwork	6.00	6.00	6.00	6.50	Contrasting curb divider	6.00	6.00	6.00	5.00	5.78
	O/S Row	I/S Unit	NA	NA	NA	7.00	7.00		Building architecture	7.00	7.00	7.00		None	NA	4.00	4.00		
	O/S Row	O/S Unit	NA	NA	NA	NA	NA		NA	NA	NA	NA		NA	NA	NA	NA		

O/S R.O.W. = Outside R.O.W.

I/S Unit = Inside Landscape Unit
O/S Unit = Outside Landscape Unit

Appendix B:
Air Quality Report

Air Quality Analysis Report
Fulton Mall Reconstruction Project
Federal Transportation Improvement Program
Project ID FRE130069
City of Fresno, California

Prepared for:

City of Fresno
2600 Fresno Street
Fresno, CA 93721
559.621.8371

Contact: Wilma Quan, Urban Planning Specialist

Prepared by:

Michael Brandman Associates
1234 O Street
Fresno, CA 93721
559.437.0310

Contact: Chryss Meier, Air Quality Analyst

Michael Brandman Associates

August 21, 2013

Table of Contents

Acronyms and Abbreviations v

Section 1: Introduction and Project Description 1
1.1 - Purpose and Methods of Analysis 1
1.2 - Purpose and Need of Project 1
1.3 - Project Location and Description 1
1.4 - Summary of Analysis Results 10
1.4.1 - Transportation Conformity Impacts 10
1.4.2 - NEPA Impacts 10
1.4.3 - Project-level Air Quality Impacts 10

Section 2: Regulatory Setting 14
2.1 - Criteria Pollutants 14
2.1.1 - Federal and State 14
2.1.2 - San Joaquin Valley Air Pollution Control District 19
2.1.3 - Fresno Council of Governments 22
2.1.4 - Pollutants of Concern 23
2.2 - Climate Change and Greenhouse Gases 27
2.2.1 - Federal 27
2.2.2 - State 29
2.2.3 - Local Agencies 33
2.2.4 - Pollutants of concern 34

Section 3: Physical Setting 36
3.1.1 - Regional Air Quality 36
3.1.2 - Local Air Quality 38
3.1.3 - Greenhouse Gas Emissions and Climate Change 40

Section 4: Impact Analysis 43
4.1 - Transportation Conformity Impacts 43
4.1.1 - Regional Conformity 43
4.1.2 - Project-Level Conformity 44
4.2 - Project-Level Air Quality Impacts 47
4.2.1 - CO Hot-spot 47
4.2.2 - Construction-Generated Criteria Pollutants 51
4.2.3 - Operational Particulate Matter Hot-spot 59
4.2.4 - Toxic Air Contaminant Analysis 61
4.2.5 - Air Quality Attainment Plan Conformity 65
4.2.6 - Greenhouse Gases and Climate Change 65

Section 5: References 72

Appendix A: 2011 RTP and 2013 FTIP Documentation

Appendix B: IAC Memo and FHWA Concurrence

Appendix C: CO Protocol Flow Charts

Appendix D: CO Hotspot Analysis

Appendix E: Roadway Construction Emissions Model Output

Appendix F: CalEEMod Output

Appendix G: EMFAC2011 Output

List of Tables

Table 1: Daily Roadway Segment Traffic Volumes Baseline and Baseline Plus Build Alternatives 5
Table 2: Daily Roadway Segment Traffic Volumes Cumulative and Cumulative Plus Build Alternatives 6
Table 3: Annual Average Daily Trips for Project Segment 7
Table 4: Level of Service Criteria 7
Table 5: Intersection Capacity Level of Service, Peak Hour 2015 8
Table 6: Intersection Capacity Level of Service, Peak Hour Cumulative 2035 Scenario 9
Table 7: National and California Ambient Air Quality Standards 15
Table 8: San Joaquin Valley Air Basin Attainment Status 20
Table 9: Caltrans Climate Change / CO_2 Reduction Strategies 32
Table 10: 2008 Inventory Fresno County 38
Table 11: Air Quality Monitoring Summary 39
Table 12: Localized Carbon Monoxide Concentrations 51
Table 13: Significant Emissions Thresholds 52
Table 14: Construction Duration - Fulton Mall 52
Table 15: Construction Duration - Cross Malls 53
Table 16: Hauling Miles- Fulton Mall Alternative 1 55
Table 17: Hauling Miles- Fulton Mall Alternative 2 56
Table 18: Hauling Miles - Cross Malls 56
Table 19: Annual Construction Emissions (Alternative 1) 57
Table 20: Annual Construction Emissions (Alternative 2) 58
Table 21: Annual Vehicle Miles Traveled by Alternative 61
Table 22: Operational Re-entrained Road Dust by Alternative 61
Table 23: Greenhouse Gas from Construction 68
Table 24: Annual Vehicle Miles Traveled by Alternative 69
Table 25: CO_2 Emission Factors for Fresno County 70
Table 26: Operational CO_2 by Alternative - Without Regulation 70
Table 27: Operational CO_2 by Alternative - With Regulation 71

List of Exhibits

Exhibit 1: Regional Location Map..... 12
Exhibit 2: Project Location Map..... 13

ACRONYMS AND ABBREVIATIONS

µm	micrometer
AADT	annual average daily trips
ADT	average daily trips
ARB	California Air Resources Control Board
CAA	Federal Clean Air Act
CAAQS	California Ambient Air Quality Standards
Caltrans	California Department of Transportation
CAPCOA	California Air Pollution Control Officers Association
CCAA	California Clean Air Act
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CO	Carbon Monoxide
DMG	California Department of Conservation, Division of Mines and Geology
DPM	diesel particulate matter
EA/FONSI	environmental assessment/finding of no significant impact
EIS	environmental impact statement
EPA	Environmental Protection Agency
FHWA	Federal Highway Administration
FSTIP	Federal Statewide Transportation Improvements Plan
FTA	Federal Transportation Agency
FTIP	Federal Transportation Improvement Program
GAMAQI	Guide for Assessing and Mitigating Air Quality Impacts
IPCC	Intergovernmental Panel on Climate Change
LOS	level of service
$MMTCO_2e$	million metric tons of carbon dioxide equivalent
$MTCO_2e$	metric tons of carbon dioxide equivalent
MPO	Metropolitan Planning Organization
MSAT	Mobile Source Air Toxics
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Protection Act
NHTSA	National Highway Traffic Safety Administration
NOA	Naturally Occurring Asbestos
NO_X	nitrogen oxides
OPR	Governor's Office of Planning and Research
PES	Preliminary Environmental Study
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter

PM_{10}	particulate matter less than 10 microns in diameter
ppm	parts per million
ROG	reactive organic gases
RTP	Regional Transportation Plan
SER	Standard Environmental Reference
SJVAB	San Joaquin Valley Air Basin
SJVAPCD	San Joaquin Valley Air Pollution Control District
SIP	State Implementation Plans
STIP	State Transportation Improvement Program
TIP	Transportation Improvement Program
TAC	toxic air contaminants
U.S.	United States
VMT	vehicle miles traveled
VOC	volatile organic compounds

SECTION 1: INTRODUCTION AND PROJECT DESCRIPTION

1.1 - Purpose and Methods of Analysis

This assessment was conducted within the context of the National Environmental Protection Act (NEPA), the California Environmental Quality Act (CEQA) and the Federal project-level conformity analysis requirements. The methodology follows the California Department of Transportation (Caltrans) Standard Environmental Reference (SER), specifically Chapter 11 (Air Quality), the San Joaquin Valley Air Pollution Control District's Guide for Assessing and Mitigating Air Quality Impacts (GAMAQI) and Rule 9120 (Transportation Conformity), and the Transportation Project-Level Carbon Monoxide Protocol (UCD 1997).

1.2 - Purpose and Need of Project

The purpose of the proposed project is to improve parking and vehicle access to local businesses on Fulton Street in order to maximize sustainable development and economic productivity in conjunction with other downtown redevelopment projects. The proposed project would also be intended to lower crime and improve safety for people walking between parking areas and businesses located on the Fulton Mall and for people who live in, work in, and visit the project area.

1.3 - Project Location and Description

The Fulton Mall (Mall) is a pedestrian mall in the City of Fresno. The Mall consists of six linear blocks that were open to traffic prior to 1964 but now do not allow public vehicle access. The Mall is bounded by Tuolumne Street to the north and Inyo Street to the south, and includes portions of three cross streets. The total length of the Mall and, therefore new roadways, would be 0.74 mile. Figures 1 and 2 show project vicinity and location maps.

The "Mall" refers specifically to the pedestrian areas between adjoining buildings located on the former City streets of Fulton, Mariposa, Merced, and Kern, which function as an integrated pedestrian Mall. Fresno Street and Tulare Street, which do allow vehicle traffic, run through the Mall and divide it into three roughly equal sections. Mall landscaping elements include fountains, planters, benches, sculptures, electrical systems, irrigation systems, and two "tot lots." The Mall does not include the adjoining buildings or their facades.

The California Department of Transportation (Caltrans), as assigned by the Federal Highway Administration (FHWA), in cooperation with the City of Fresno (City) proposes to reconstruct Fulton Mall (Mall) as a complete street by reintroducing vehicle traffic lanes to the existing pedestrian mall.

The proposed project has three Alternatives, including two Build Alternatives and a No Build Alternative. Each alternative is discussed in greater detail below. Alternative 1 and Alternative 2 are

considered the Build Alternatives. Each Build Alternative proposes to reconstruct the Mall using "complete streets" design concepts. Complete streets are those designed to function as shared public space, or as "living streets" - for pedestrians, cyclists, outdoor businesses, and slow-moving, cautiously driven vehicles. Complete streets may include narrow roadways, corner bulb-outs, winding streets, and other traffic calming measures to lower driving speeds; street trees and other landscape elements; wide pedestrian sidewalks and crosswalks; and bicycle accommodations such as dedicated bicycle lanes or wide shoulders. The purpose of incorporating these design concepts into the proposed project is to retain portions of the historic fabric and character of the Mall, maintaining the key elements, feeling and unique experience of a pedestrian mall in downtown Fresno.

Alternative 1 consists of reopening the Mall with two-way streets, with one lane of vehicular traffic in each direction alongside bicycle, pedestrian, and potentially other travel modes. On-street vehicle parking spaces would be reintroduced along the length of the Mall (including cross streets), and construction of streetscape improvements would optimize the streets for the new blend of travel modes. One 11-foot vehicle travel lane would run in each direction, with a parallel parking lane of 9 feet included on both sides of the streets. A 20-foot sidewalk included on both sides of the streets would allow for walking and pedestrian-only seating, landscaping, lighting, and public art. Impacts to native earth during project construction are not anticipated.

The existing 20 works of sculpture present on the Mall today would all remain, though some may be moved so as to be incorporated in sidewalk areas of the new streetscape. Only the three fountains found along the Kern Mall, west of Fulton, would remain. All of the planter beds and raised seating areas found along the Mall today would be removed in favor of wide sidewalks that incorporate artwork and seating areas. The two tot lots present, one located near the corner of Merced and Fulton, and the other located near the corner of Kern and Fulton, would be relocated and potentially combined into one larger tot on Kern Mall between Fulton Street and Home Run Alley, or near the corner of Mariposa and Fulton.

Alternative 2 consists of reconnecting the street grid as in Alternative #1, but would include rebuilding distinctive elements of the Mall in five to six specific locations, known as "vignettes." The vignettes would include many of the existing elements (sculptures, fountains, pavement pattern, trees, etc.). One 11-foot vehicle travel lane would run in each direction and would curve through the vignettes to avoid existing landscape features. Outside the vignette areas the street would be straight, and the landscape would include a 9-foot parallel parking lane and a pedestrian-only walking, seating, vegetation, and public art area 20 feet in width on one or both sides of the street. Within the vignettes the existing Mall landscape elements would be kept maximally intact. The remaining space on each side of the street would be dedicated to pedestrian travel, seating, vegetation, and artwork. Impacts to native earth during project construction are not anticipated.

Fourteen of 20 sculptures would remain in their precise current locations. The other six (along with the various tile mosaics benches on the Mall today) would be reconfigured differently within the current right-of-way to accommodate the new streetscape. Street lighting outside the vignettes would be contemporary and pedestrian-oriented, but the original Mall fixtures would be rehabilitated within each vignette. A total of 12 fountains - nine in vignettes and three on Kern Mall west of Fulton - would remain in place. The 12 fountains would be fully rebuilt or restored to working order. The two tot lots present, one located near the corner of Merced and Fulton, and the other located near the corner of Kern and Fulton, would be relocated and potentially combined into one larger tot on Kern Mall between Fulton Street and Home Run Alley, or near the corner of Mariposa and Fulton.

Alternative 3 is the no-build Alternative. New streets would not be constructed and the Mall would remain as it now exists

The three alternatives are evaluated for construction activity to occur in 2014. The three alternatives are evaluated for year 2015 and 2035. The main difference between Alternative 1 and Alternative 2 is the inclusion of vignettes in Alternative 2. In addition, Alternative 1 would have a parallel parking lane of 9 feet on both sides of the street, and Alternative 2 would have a parallel parking lane on one or both sides of the street.

The roadway volumes and traffic reassignment information Transportation Impact Report (TIS) for project, prepared by Fehr and Peers, was utilized for this document (Fehr and Peers, 2013). As disclosed in the TIS, the study conducted a daily traffic evaluation that looked at the change in daily traffic volumes, and did not conduct a detailed roadway segment Level of Service (LOS) analysis. The project does not propose any additional traffic generating land uses. The alternatives are not expected to affect traffic volumes. Since the Build Alternatives propose narrow, two-way vehicular streets, it is anticipated that the reintroduced roadways associated with these alternatives would serve existing traffic by providing access to existing businesses along the pedestrian malls, but would not induce additional travel upon opening (Fehr and Peers, 2013).

Table 1 contains the annual average daily trips for each study roadway segment in the project area in the existing, or ‘Baseline’ scenario, both with and without the Build Alternatives. Table 2 contains the annual average daily trips for each study roadway segment in the project area in the cumulative Year 2035 scenario, both with and without Build Alternatives. Table 3 contains the annual average daily trips for the study roadways under Alternatives 1 and 2 (Build Alternatives) and Alternative 3 (No Build).

As shown in Table 1, Table 2, and Table 3, the Build Alternatives would appear to result in slightly more Average Daily Trips than the No Build scenario. Per the Transportation Impact Report:

> … it is anticipated that the reintroduced roadways associated with these alternatives would serve existing traffic by providing access to existing businesses along the pedestrian malls, but would not induce additional travel upon opening.

And

> The Open to Traffic alternatives may cause some shifts in local traffic patterns by opening the existing Fulton Mall and its cross streets to vehicle traffic. However, since these alternatives would create narrow, two-way vehicular streets, these new roadways would primarily carry local trips to access adjacent businesses. Therefore, these changes in traffic patters would be localized to roadways in the project study area.

The apparent increase is not a trip increase from Build Scenarios, but is a result of reassignment of existing trips through the project area. All trips would be existing in the project area under the Build and No Build Alternatives. Under the Build Alternatives, existing trips within the project area would be rerouted from existing travel paths through the project segments. Therefore, the apparent increase on roadway segments identified in Table 1, Table 2, and Table 3 result from a decrease of trips on other project area roadways due to the reassignment of existing trips. Alternative 1 and Alternative 2 (Build Alternatives) would not increase the number of trips on the project area roadways compared to Alternative 3 (No Build Alternative). Table 4 contains the City of Fresno's defined LOS based on the average vehicle delay (in seconds per vehicle).

Table 1: Daily Roadway Segment Traffic Volumes Baseline and Baseline Plus Build Alternatives

Roadway Segment	Annual Average Daily Trips	
	Baseline (No Build) Conditions	Baseline Plus Build Alternatives
1. Broadway: North of Stanislaus St.	2,588	2,580
2. Fulton Street: North of Stanislaus St.	2,731	2,800
3. Van Ness Avenue: North of Stanislaus St.	6,339	6,270
4. Fulton Mall: Tuolumne St. to Inyo St.[1]	N/A	210
5. Van Ness Avenue: Fresno St. to Tulare St.	9,991	10,020
6. Van Ness Avenue: Tulare St. to Inyo St.	9,728	9,740
7. Van Ness Avenue: Inyo St. to Ventura Ave.	7,586	7,580
8. Stanislaus Street: M Street to Van Ness Ave.	4,360	4,340
9. Stanislaus Street: Broadway to E Street	6,996	7,010
10. Tuolumne Street: E Street to Broadway	5,586	5,600
11. Tuolumne Street: Van Ness Ave. to M Street	4,299	4,290
12. Fresno Street: Broadway to Van Ness Ave.	14,444	14,380
13. Fresno Street: Van Ness Ave. to M Street	12,150	12,080
14. Tulare Street: H Street to Van Ness Ave.	9,304	9,280
15. Inyo Street: H Street to Van Ness Ave.	3,301	3,300
16. Ventura Avenue: Van Ness Ave. to M Street	11,838	11,910
Total ADT	111,241	111,390

NA = Not Applicable
No Build is Alternative 3
Build Alternatives are Alternative 1 and Alternative 2
1. Fulton Street is a pedestrian mall between Tuolumne St. and Inyo St. under Baseline Conditions and Baseline Plus Project: Pedestrian Mall alternative.
Source: Fehr and Peers, 2013.

Table 2: Daily Roadway Segment Traffic Volumes Cumulative and Cumulative Plus Build Alternatives

Roadway Segment	Annual Average Daily Trips	
	Cumulative (No Build) Conditions	Cumulative Plus Build Alternatives
1. Broadway: North of Stanislaus St.	13,930	13,810
2. Fulton Street: North of Stanislaus St.	6,310	6,360
3. Van Ness Avenue: North of Stanislaus St.	11,300	11,710
4. Fulton Mall: Tuolumne St. to Inyo St.[1]	N/A	2,310
5. Van Ness Avenue: Fresno St. to Tulare St.	14,280	13,950
6. Van Ness Avenue: Tulare St. to Inyo St.	13,750	13,950
7. Van Ness Avenue: Inyo St. to Ventura Ave.	13,530	13,640
8. Stanislaus Street: M Street to Van Ness Ave.	14,190	14,030
9. Stanislaus Street: Broadway to E Street	22,110	22,010
10. Tuolumne Street: E Street to Broadway	5,570	5,990
11. Tuolumne Street: Van Ness Ave. to M Street	5,290	5,210
12. Fresno Street: Broadway to Van Ness Ave.	18,420	18,480
13. Fresno Street: Van Ness Ave. to M Street	20,200	20,050
14. Tulare Street: H Street to Van Ness Ave.	18,780	18,980
15. Inyo Street: H Street to Van Ness Ave.	6,150	6,120
16. Ventura Avenue: Van Ness Ave. to M Street	24,880	24,570
Total ADT	208,690	211,170

NA = Not Applicable
No Build is Alternative 3
Build Alternatives are Alternative 1 and Alternative 2
1. Fulton Street is a pedestrian mall between Tuolumne St. and Inyo St. under Baseline Conditions and Baseline Plus Project: Pedestrian Mall alternative.
Source: Fehr and Peers, 2013.

Table 3: Annual Average Daily Trips for Project Segment

Year	Annual Average Daily Trips		
	Alternative I (Build Alternative)	Alternative II (Build Alternative)	Alternative III (No Project/No Build Alternative)
2010	NA	NA	NA
2015	210	210	NA
2035	2,310	2,310	NA

NA = Not Applicable
Source: Fehr and Peers, 2013.

Table 4: Level of Service Criteria

Level of Service	Average Vehicle Delay (seconds/vehicle)	
	Signalized Intersections	Unsignalized Intersections
A	≤ 10.0	≤ 10.0
B	10.1 - 20.0	10.1 - 15.0
C	20.1 - 35.0	15.1 - 25.0
D	35.1 - 55.0	25.1 - 35.0
E	55.1 - 80.0	35.1 - 50.0
F	>80	>50

Source: Fehr and Peers, 2013.

Table 5 contains the LOS for Project-affected intersections in 2015, in the morning and evening peak hours (the most impacted timeframes) for Alternatives 1 and 2 (Build Alternatives) and Alternative 3 (No Build). As shown in Table 5, the build alternatives not change the LOS for the study area intersections under the 2015 Scenario.

Table 5: Intersection Capacity Level of Service, Peak Hour 2015

Intersection	Delay (seconds)- Level of Service					
	Alternative 1 (Build Alternative)		Alternative 2 (Build Alternative)		Alternative 3 (No Project/No Build Alternative)	
	AM	PM	AM	PM	AM	PM
1. Stanislaus St / Van Ness Ave	11-B	13-B	11-B	13-B	11-B	13-B
2. Stanislaus St / Fulton St	12-B	11-B	12-B	11-B	11-B	11-B
3. Stanislaus St / Broadway	10-A	10-B	10-A	10-B	10-A	10-B
4. Tuolumne St / Broadway	18-B	17-B	18-B	17-B	18-B	17-B
5. Tuolumne St /Fulton St	12-B	11-B	12-B	11-B	12-B	11-B
6. Tuolumne St /Van Ness Ave	12-B	13-B	12-B	13-B	12-B	13-B
7. Fresno St / H St	NA	NA	NA	NA	NA	NA
8. Fresno St /Fulton St	4-A	3-A	4-A	3-A	NA	NA
9. Fresno St /Van Ness Ave	35-C	**37-D**	35-C	**37-D**	35-C	35-C
10. Tulare St / H St	12-B	11-B	12-B	11-B	12-B	11-B
11. Tulare St /Fulton St	4-A	4-A	4-A	4-A	NA	NA
12. Tulare St /Van Ness Ave	23-C	26-C	23-C	26-C	23-C	21-C
13. Inyo St / H Street	12-B	11-B	12-B	11-B	13-B	12-B
14. Inyo St /Fulton St	9-A	9-A	9-A	9-A	10-A	10-A
15. Inyo St /Van Ness Ave	13-B	11-B	13-B	11-B	13-B	11-B
16. Ventura Ave / H St	**33-D**	19-C	**33-D**	19-C	**34-D**	**18-D**
17. Ventura Ave / Broadway	20-C	25-C	20-C	25-C	20-C	25-C
18. Ventura Ave / Van Ness Ave	25-C	21-C	25-C	21-C	25-C	21-C

Notes:
LOS D or worse are bolded for easy identification.
Source: Fehr and Peers, 2013.

Table 6 contains the LOS for Project-affected intersections in 2035, in the morning and evening peak hours (the most impacted timeframes) for Alternatives 1 and 2 (Build Alternatives) and Alternative 3 (No Build). As shown in Table 5, the Build Alternatives would improve the LOS for the study area intersections under the 2035 Scenario.

Table 6: Intersection Capacity Level of Service, Peak Hour Cumulative 2035 Scenario

Intersection	Delay (seconds)- Level of Service					
	Alternative 1 (Build Alternative)		Alternative 2 (Build Alternative)		Alternative 3 (No Project/No Build Alternative)	
	AM	PM	AM	PM	AM	PM
1. Stanislaus St / Van Ness Ave	29-C	52-C	29-C	52-C	28-C	**53-D**
2. Stanislaus St / Fulton St	18-B	17-B	18-B	17-B	18-B	16-B
3. Stanislaus St / Broadway	**51-D**	**>150-F**	**51-D**	**>150-F**	**50-D**	**>150-F**
4. Tuolumne St / Broadway	**41-D**	**>150-F**	**41-D**	**>150-F**	**46-D**	**>150-F**
5. Tuolumne St /Fulton St	23-C	28-C	23-C	28-C	22-C	19-B
6. Tuolumne St /Van Ness Ave	**35-D**	**39-D**	**35-D**	**39-D**	**38-D**	**40-D**
7. Fresno St / H St	**77-E**	**92-F**	**77-E**	**92-F**	**84-F**	**102-F**
8. Fresno St /Fulton St	19-B	13-B	19-B	13-B	NA	NA
9. Fresno St /Van Ness Ave	**48-D**	**48-D**	**48-D**	**48-D**	**49-D**	**62-E**
10. Tulare St / H St	15-B	22-C	15-B	22-C	14-B	27-C
11. Tulare St /Fulton St	14-B	15-B	14-B	15-B	NA	NA
12. Tulare St /Van Ness Ave	**42-D**	33-C	**42-D**	33-C	**38-D**	35-C
13. Inyo St / H Street	20-B	14-B	20-B	14-B	12-B	23-C
14. Inyo St /Fulton St	9-A	10-B	9-A	10-B	11-B	9-A
15. Inyo St /Van Ness Ave	14-B	13-B	14-B	13-B	13-B	13-B
16. Ventura Ave / H St	**>150-F**	**>150-F**	**>150-F**	**>150-F**	**>150-F**	**>150-F**
17. Ventura Ave / Broadway	17-B	19-B	17-B	19-B	15-B	18-B
18. Ventura Ave / Van Ness Ave	29-C	31-C	29-C	31-C	29-C	32-C

Notes:
LOS D or worse are bolded for easy identification.
Source: Fehr and Peers, 2013.

1.4 - Summary of Analysis Results

This section describes the results of analysis contained in this report; specifically, this section provides the Project's air quality impacts relative to criteria established by California Environmental Quality Act, the San Joaquin Valley Air Pollution Control District's (SJVAPCD) guidance, as well the transportation conformity requirements under the federal Clean Air Act.

1.4.1 - Transportation Conformity Impacts

For transportation projects, there are two levels of conformity—regional and project-level.

Regional Conformity

- The Project is located in an area with a conforming regional transportation plan and transportation improvement plan, and is contained within those plans. The project is found to be in regional conformity.

Project Level Conformity

- The project area is in attainment/maintenance for the federal CO standard. Therefore, a CO hot-spot analysis is not required.
- The project area is in attainment/maintenance for the federal PM_{10} standards. Therefore, PM_{10} hot-spot analyses are not required. The project does not require a qualitative or quantitative hotspot analysis, as it is not a project of air quality concern.

1.4.2 - NEPA Impacts

The FHWA's 1987 technical advisory contains guidance for air quality impacts assessment for an EIS, but does not specify the content requirements for an EA/FONSI. The guidance states that information should be presented, as appropriate, for two scales: the 'mesoscale' or regional level for ozone, hydrocarbons and nitrogen oxide; and the 'microscale' or localized level for carbon monoxide. This document contains regional conformity (mesoscale) as well estimates the project-generated emissions in respect to the SJVAPCD's significance criteria for regional pollutants, and localized or 'hot-spot' CO analysis (microscale). Therefore, this document appropriately addresses the NEPA considerations as presented by the FHWA.

1.4.3 - Project-level Air Quality Impacts

- The Project is not in an area likely to contain naturally occurring asbestos (NOA); therefore, there is little potential for NOA impacts during construction.
- The Project's construction would not generate quantities of criteria air pollutants or ozone precursors that exceed the San Joaquin Valley Air Pollution Control District's thresholds of significance. Mitigation measures for construction-generated fugitive dust and construction exhaust emissions is added to minimize potential impacts.

- The Project would not generate long-term construction impacts.
- The Project contains low potential for Mobile Source Air Toxics (MSAT) effects.
- The project would not generate localized CO impacts from project operation.
- The Project's construction-generated greenhouse gas emissions would be limited in scope and temporary, and would occur prior to 2020. In addition, the project would not generate an increase in operational emissions of greenhouse gases.
- The Project would not conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases.

Exhibit 1: Regional Location Map

Exhibit 2: Project Location Map

SECTION 2: REGULATORY SETTING

Air pollutants are regulated at the national, State, and air basin level; each agency has a different degree of control. The United States Environmental Protection Agency (EPA) regulates at the national level. The California Air Resources Board (ARB) regulates at the state level. The San Joaquin Valley Air Pollution Control District (SJVAPCD) regulates at the regional level.

2.1 - Criteria Pollutants

2.1.1 - Federal and State

The EPA is responsible for global, international, national, and interstate air pollution issues and policies. The EPA sets national vehicle and stationary source emission standards, oversees approval of all State Implementation Plans (SIP), provides research and guidance for air pollution programs, and sets National Ambient Air Quality Standards (NAAQS), also known as federal standards. There are NAAQS for six common air pollutants, called criteria air pollutants, which were identified from provisions of the Clean Air Act (CAA) of 1970. The criteria pollutants are:

- Ozone
- Particulate matter (PM_{10} and $PM_{2.5}$)
- Nitrogen dioxide
- Carbon monoxide (CO)
- Lead
- Sulfur dioxide

The NAAQS were set to protect public health, including that of sensitive individuals; thus, the standards continue to change as more medical research is available regarding the health effects of the criteria pollutants.

The SIP for the State of California is administered by ARB, which has overall responsibility for statewide air quality maintenance and air pollution prevention. A SIP is prepared by each state describing existing air quality conditions and measures that will be followed to attain and maintain NAAQS. The SIP incorporates individual federal attainment plans for regional air districts. Federal attainment plans prepared by each air district are sent to ARB to be approved and incorporated into the California SIP. Federal attainment plans include the technical foundation for understanding air quality (e.g., emission inventories and air quality monitoring), control measures and strategies, and enforcement mechanisms.

ARB also administers California Ambient Air Quality Standards (CAAQS) for the ten air pollutants designated in the California Clean Air Act (CCAA). The ten state air pollutants are the six criteria pollutants listed above as well as visibility reducing particulates, hydrogen sulfide, sulfates, and vinyl chloride. The national and state ambient air quality standards are summarized in Table 7.

Table 7: National and California Ambient Air Quality Standards

Air Pollutant	Averaging Time	California Standard	National Standard
Ozone	1-hour	0.09 ppm	—
	8-hour	0.070 ppm	0.075 ppm
Particulate matter (PM_{10})	24-hour	50 µg/m^3	150 µg/m^3
	Mean	20 µg/m^3	—
Particulate matter ($PM_{2.5}$)	24-hour	—	35 µg/m^3
	Mean	12 µg/m^3	15.0 µg/m^3
Carbon monoxide (CO)	1-hour	20 ppm	35 ppm
	8-hour	9.0 ppm	9 ppm
Nitrogen dioxide (NO_2)	1-hour	0.18 ppm	0.100 ppm
	Mean	0.030 ppm	0.053 ppm
Sulfur dioxide (SO_2)	1-hour	0.25 ppm	0.075 ppm
	24-hour	0.04 ppm	—
	3-hour		0.5 ppm
Lead	30-day	1.5 µg/m^3	—
	Quarter	—	1.5 µg/m^3
	Rolling 3-month average	—	0.15 µg/m^3
Hydrogen sulfide	1-hour	0.03 ppm	—
Sulfates	24-hour	25 µg/m^3	—
Vinyl chloride[1]	24-hour	0.010 ppm	—

Notes:
[1] The ARB has identified vinyl chloride as toxic air contaminant (TAC) with no threshold level of exposure for adverse health effects. Therefore, the vinyl chloride the standard is not a threshold but is the minimum detectable limit. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.
Abbreviations:
ppm = parts per million (concentration) µg/m^3 = micrograms per cubic meter
Mean = Annual Arithmetic Mean 30-day = 30-day average Quarter = Calendar year quarter
Source: SJVAPCD, 2013.

The EPA and the ARB designate air basins where ambient air quality standards are exceeded as "nonattainment" areas. If standards are met, the area is designated as an "attainment" area. If there is inadequate or inconclusive data to make a definitive attainment designation, they are considered "unclassified." Each standard has a different definition, or 'form' of what constitutes attainment, based on specific air quality statistics. For example, the Federal 8-hour CO standard is not to be exceeded more than once per year; therefore, an area is in attainment of the CO standard if no more than one 8-hour ambient air monitoring values exceeds the threshold per year. In contrast, the

Federal annual $PM_{2.5}$ standard is met if the three-year average of the annual average $PM_{2.5}$ concentration is less than or equal to the standard.

In addition to attainment designations, the EPA and ARB further classify ozone and PM nonattainment areas based on the severity of the air pollution monitoring, based on the deviation from the respective standard. Federal ozone nonattainment areas are further designated as marginal, moderate, serious, severe, or extreme as a function of deviation from standards. Federal PM_{10} areas are further classified as serious or moderate. ARB classifies 1-hour ozone nonattainment areas as marginal, moderate, serious, severe, or extreme.

Federal Regulations and Guidance

NEPA

NEPA establishes national environmental policy and goals for the protection, maintenance, and enhancement of the environment and provides a process for implementing these goals within the federal agencies. Section 102 requires federal agencies to incorporate environmental considerations in their planning and decision-making through a systematic interdisciplinary approach.

The NEPA process consists of an evaluation of the environmental effects of a federal undertaking including its alternatives. There are three levels of analysis: categorical exclusion determination; preparation of an environmental assessment/finding of no significant impact (EA/FONSI); and preparation of an environmental impact statement (EIS). Each federal agency promulgates or adopts its own guidance for preparation and content of NEPA documents. The FHWA's Technical Advisory T6640.8A, Guidance for Preparing and Processing Environmental And Section 4(F) Documents, was published in 1987, and provides the overarching guidance for environmental document analysis and contents for projects that require a FHWA approval. As stated by the advisory, the material is not regulatory, but was developed to provide guidance for uniformity and consistency in the format, contents and processing of various environmental studies and documents pursuant to NEPA.

The FHWA's 1987 technical advisory contains guidance for air quality impacts assessment for an EIS, but does not specify the content requirements for an EA/FONSI. The guidance states that information should be presented, as appropriate, for two scales: the 'mesoscale' or regional level for ozone, hydrocarbons and nitrogen oxide; and the 'microscale' or localized level for carbon monoxide. This document contains regional conformity (mesoscale) as well estimates the project-generated emissions in respect to the SJVAPCD's significance criteria for regional pollutants, and localized or 'hot-spot' CO analysis (microscale). Therefore, this document appropriately addresses the NEPA considerations as presented by the FHWA.

Transportation Conformity

Transportation Conformity is a process set up under the CAA to ensure that transportation planning, transportation improvement programs, and projects are consistent with the plans to achieve and maintain NAAQS. Specific requirements are set by EPA regulations in 40 CFR 93, EPA and U.S.

Department of Transportation guidance documents, and local regulations and procedures set up by Metropolitan Planning Organizations and Air Pollution Control Districts.

The Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) must be able to find that the Federal Transportation Improvement Program (FTIP) conforms to the adopted State Implementation Plan and that priority has been given to timely implementation of the transportation control measures found in the SIP. The projects in the TIP should also not further exacerbate the existing air quality problems

Table 1 of 40 CFR 93.109 contains the conformity required from transportation plans, federal transportation improvement plans, and projects. The Project is subject to the following conformity criteria:

Project (From a Conforming Plan and TIP)

- §93.114 Currently conforming plan and FTIP
- §93.115 Project from a conforming plan and FTIP
- §93.116 CO, PM_{10} and $PM_{2.5}$ hot-spots
- §93.117 PM_{10} and $PM_{2.5}$ control measures

Regional Conformity

The Federal CAA requires that all transportation plans and programs pass the air quality conformity test. This process involves forecasting future emissions of air pollution to determine whether the amount of future pollution resulting from the plan or program would be within the allowable limit for motor vehicle emissions.

Transportation conformity must be determined for all federal nonattainment pollutants classified as regional pollutants. In the San Joaquin Valley Air Basin (SJVAB), those pollutants are ozone and $PM_{2.5}$; the SJVAB is in attainment of federal PM_{10} standards. Transportation projects also generate CO, which is considered a localized pollutant. CO micro-scale modeling is required to determine whether a transportation project would cause or contribute to localized violations of federal CO standards.

Regional conformity must be determined based on a full study at least every 3 years. In California, it is determined at least every two years when the state-required regional transportation plan (RTP) updates are done. In addition, a new federal transportation improvement program (FTIP) is required every four years, for which a conformity determination is required. Amendments to both the RTP and FTIP between mandated conformity analyses also must have conformity demonstrated, including a full-scale revision of the regional analysis if regionally significant projects are added, deleted, or significantly modified.

Regional conformity is demonstrated by showing that the project is included in a conforming RTP and FTIP with substantially the same design concept and scope that was used for the regional conformity analysis.

Project-Level Conformity

Project level conformity is demonstrated by showing that it will not cause a localized exceedance of CO and/or PM standards, and that it will not interfere with "timely implementation" of transportation control measures called out in the state implementation plan.

In March 2006, EPA issued amendments to the Transportation Conformity Rule (40 CFR 93) to address localized impacts of particulate matter: "$PM_{2.5}$ and PM_{10} Hot-Spot Analyses in Project-level Transportation Conformity Determinations for the New $PM_{2.5}$ and Existing PM_{10} National Ambient Air Quality Standards" (71 FR 12468). This amendment requires the assessment of localized air quality impacts in PM_{10} and $PM_{2.5}$ federal nonattainment and maintenance areas for federally funded or approved transportation projects of air quality concern. An assessment of localized impacts (i.e., "hot-spot analysis") examines potential air quality impacts on a scale smaller than an entire nonattainment or maintenance area. A hot-spot analysis is a means of demonstrating that a transportation project meets CAA conformity requirements to support state and local air quality goals. EPA further amended 40 CFR 93 in March 2012. The final rule primarily restructures two sections of the conformity rule, 40 CFR 93.109 and 93.119, so that the existing rule requirements clearly apply to areas designated for future new or revised NAAQS, thus reducing the need to amend the transportation conformity rule merely to reference specific new NAAQS.

The Project is located in an area that is in maintenance of federal CO and PM_{10} standards. Therefore, hot-spot analysis for CO and PM_{10} are not required under the Transportation Conformity Rule.

California Regulations and Guidance

Caltrans

The California Department of Transportation (Caltrans) has prepared multiple guidance documents to assist in air quality and transportation conformity analyses. A primary source of guidance is the Standard Environmental Reference (SER), which is an on-line guidance document to assist state and location agency staff to plan, prepare, submit and evaluate environmental documents for transportation projects. SER Chapter 11 contains specific guidance for air quality analysis, as well as references to state and federal analysis requirements and links to other resource documents.

Toxic Air Contaminant Regulations

ARB's Toxic Air Contaminant (TAC) program traces its beginning to the criteria pollutant program in the 1960s. For many years, the criteria pollutant control program has been effective at reducing TACs, since many volatile organic compounds and PM constituents are also TACs. During the 1980s, the public's concern over toxic chemicals heightened. As a result, citizens demanded protection and control over the release of toxic chemicals into the air. In response to public concerns,

the California legislature enacted the Toxic Air Contaminant Identification and Control Act governing the release of TACs into the air. This law charges ARB with the responsibility for identifying substances as TACs, setting priorities for control, adopting control strategies, and promoting alternative processes. ARB has designated almost 200 compounds as TACs. Additionally, ARB has implemented control strategies for a number of compounds that pose high health risk and show potential for effective control.

In July 2001, ARB approved an Air Toxic Control Measure for construction, grading, quarrying and surface mining operations to minimize NOA emissions. The regulation requires application of best management practices to control fugitive dust in areas known to have NOA, as well as requiring notification to the local air district prior to commencement of ground-disturbing activities.

ARB approved a regulatory measure to reduce emissions of toxics and criteria pollutants by limiting idling of heavy-duty diesel vehicles. The driver of any vehicle subject to this section (1) shall not idle the vehicle's primary diesel engine for greater than 5 minutes at any location and (2) shall not idle a diesel-fueled auxiliary power system for more than 5 minutes to power a heater, air conditioner, or any ancillary equipment on the vehicle if it has a sleeper berth and the truck is located within 100 feet of a restricted area (homes and schools).

ARB's Land Use Handbook

ARB adopted the Air Quality and Land Use Handbook: A Community Health Perspective (Land Use Handbook) in 2005. The Land Use Handbook provides information and guidance on siting sensitive receptors in relation to sources of TACs. The sources of TACs identified in the Land Use Handbook are high-traffic freeways and roads, distribution centers, rail yards, ports, refineries, chrome plating facilities, dry cleaners, and large gasoline dispensing facilities. If a project involves siting a sensitive receptor or source of TAC discussed in the Land Use Handbook, siting mitigation may be added to avoid potential land use conflicts, thereby reducing the potential for health impacts to the sensitive receptors (ARB 2005). The Project would not construct a source of TACs or a location of sensitive receptors.

2.1.2 - San Joaquin Valley Air Pollution Control District

The Project is within the San Joaquin Valley Air Basin, which is under the jurisdiction of the San Joaquin Valley Air District (SJVAPCD). The SJVAPCD is responsible for controlling emissions, primarily from stationary sources. The SJVAPCD maintains an air quality monitoring stations throughout Fresno County. The SJVAPCD, in coordination with the Council of Governments and Association of Governments (including Fresno COG), is also responsible for developing, updating, and implementing the Air Quality Attainment Plan for the area. In 2002, the SJVAPCD adopted the Guide for Assessing and Mitigating Air Quality Impacts, which details the recommended environmental setting, impacts discussions, and significance thresholds to be applied to projects in the SJVAB.

Attainment Status

The current attainment designations for the SJVAB are shown in Table 8. The area is designated as nonattainment for the California and federal ozone standards, and the California PM_{10} standard.

Table 8: San Joaquin Valley Air Basin Attainment Status

Pollutant	California Status	Federal Status
Ozone	Nonattainment	Nonattainment
PM_{10}	Nonattainment	Attainment/Maintenance
$PM_{2.5}$	Nonattainment	Nonattainment
Carbon Monoxide	Attainment/Unclassified	Attainment/Maintenance
Nitrogen Dioxide	Attainment/Unclassified	Attainment/Unclassified
Sulfur Dioxide	Attainment/Unclassified	Attainment/Unclassified
Source: SJVAPCD 2013		

Air Quality Attainment Plans

Ozone Plans

As an extreme nonattainment area for the 1-hour ozone national standard, the SJVAPCD adopted the Extreme Ozone Attainment Demonstration Plan in 2004. On March 8, 2010, the EPA approved the Extreme Ozone Attainment Demonstration Plan for 1-hour ozone. Although effective June 15, 2005, the EPA revoked the 1-hour standard, the control requirements remain in effect to ensure progress toward meeting the new, more stringent 8-hour ozone standard that has replaced the 1-hour standard. The Plan contains commitments to reduce a precursor of ozone, NO_x, including NO_x reductions from indirect sources.

The 2007 Ozone Plan contains measures to reduce ozone and particulate matter precursor emissions to bring the Basin into attainment with the federal 8-hour ozone standard. The 2007 Ozone Plan calls for a 75-percent reduction of NO_x and a 25-percent reduction of ROG. The plan, with a "dual path" strategy, demonstrates attainment of the federal 8-hour ozone standard. The SJVAPCD Governing Board adopted the 2007 Ozone Plan on April 30, 2007. The ARB approved the plan on June 14, 2007.

Particulate Matter Plans

The SJVAPCD adopted the 2007 PM_{10} Maintenance Plan in September 2007 to assure the San Joaquin Valley's continued attainment of the EPA's PM_{10} standard. The EPA designated the valley as an attainment/maintenance area for PM_{10}.

The 2008 $PM_{2.5}$ Plan builds upon the strategy adopted in the 2007 Ozone Plan to bring the Basin into attainment of the 1997 national standards for $PM_{2.5}$. The EPA has identified NO_x and sulfur dioxide as precursors that must be addressed in air quality plans for the 1997 $PM_{2.5}$ standards. The 2008

$PM_{2.5}$ Plan is a continuation of the SJVAPCD's strategy to improve the air quality in the Basin. The SJVAPCD adopted the 2012 $PM_{2.5}$ Plan in December 2012. This plan addresses EPA's most recent 24-hour $PM_{2.5}$ standard of 35 µg/m³.

Rules and Regulations

The SJVAPCD administers rules and regulations to obtain and maintain attainment of the State and federal air quality standards. The rules and regulations that apply to this Project include, but are not limited to, the following:

- Rule 4002 - National Emission Standards for Hazardous Air Pollutants.
- Rule 4102 - Nuisance. The purpose of this rule is to protect the health and safety of the public, and applies to any source operation that emits or may emit air contaminants or other materials.
- Rule 4641 - Cutback, Slow Cure, and Emulsified Asphalt, Paving and Maintenance Operations. The purpose of this rule is to limit ROG emissions from asphalt paving and maintenance operations. If asphalt paving will be used, then the paving operations will be subject to Rule 4641.
- Regulation VIII - Fugitive PM_{10} Prohibitions. Rules 8011-8081 are designed to reduce PM_{10} emissions (predominantly dust/dirt) generated by human activity, including construction and demolition activities, road construction, bulk materials storage, paved and unpaved roads, carryout and trackout, etc.
- Rule 9120 Transportation Conformity. This rule incorporates the requirements of the federal Transportation Conformity Rule into the SJVAPCD's rulebook.

Rule 9510 (ISR)

Rule 9510 - Indirect Source Review (ISR) reduces the impact of oxides of nitrogen (NO_x) and PM_{10} emissions from growth in the Air Basin. A master Air Impact Assessment application must be submitted to begin rule compliance.

Compliance with Rule 9510 reduces the emissions impact of the project land uses through incorporation of onsite measures as well as payment of an offsite fee that funds emission reduction projects in the Air Basin. The emissions analysis for Rule 9510 is highly detailed and is dependent on the exact use design that is expected to be constructed or installed. The required amounts of emission reductions required by Rule 9510 for transportation projects that exceed 2 tons per year of NO_X or PM_{10} emissions during construction are as follows:

Construction Exhaust: 20 percent of the total NO_x emissions, and
45 percent of the total PM_{10} emissions.

2.1.3 - Fresno Council of Governments

Fresno Council of Governments (Fresno COG) is the Metropolitan Planning Organization (MPO) for Fresno County, and is a voluntary association of local governments consisting of:

- City of Clovis
- City of Coalinga
- City of Firebaugh
- City of Fowler
- City of Fresno
- City of Huron
- City of Kerman
- City of Kingsburg
- City of Mendota
- City of Orange Cove
- City of Parlier
- City of Reedley
- City of San Joaquin
- City of Sanger
- City of Selma
- County of Fresno

As the designated MPO, Fresno COG is mandated by the federal government to research and draw up plans for transportation, growth management, hazardous waste management, and air quality. Additional mandates exist at the state level.

Regional Transportation Plan (RTP)

Transportation control measures provided by Fresno COG include those contained in the Regional Transportation Plans (RTP), the most current version of which is the 2011 RTP. The 2011 RTP has control measures to reduce emissions from on-road sources by incorporating strategies such as high occupancy vehicle interventions, transit, and information-based technology interventions. The measures implemented by ARB and Fresno COG affect the Project indirectly by regulating the vehicles that the residents may use and regulating public transportation.

The project is included in the 2011 RTP through 2011 RTP Amendment #2 as Project ID FRE500768. Excerpts from the 2011 RTP Amendment #2 with the project information is provided in Appendix A.

Fresno COG is currently circulating the 2014 RTP for informal and early public review and comment. The 2014 RTP, also called the Regional Transportation Plan 2040, charts a 25-year course to the year 2040. The 2014 RTP addresses greenhouse gas emission reductions and other air emissions with a goal of sustainable planning.

Federal Transportation Improvement Plan

The FTIP is a compilation of project lists from the State Transportation Improvement Program (STIP), urbanized and non-urbanized areas, and other programs using federal funding. The 2013 FTIP is composed of two parts. The first is a priority list of projects and project segments to be carried out in a four-year period. The second is a financial plan that demonstrates how the TIP can be implemented. The project was included in the 2013 FTIP Appendix F, Regional Transportation Plan

Project Listing 2011 through 2035, as RTP ID FRE500768. The project was also included in 2013 FTIP Amendment #1, dated August 2012, as Project ID FRE130069. Excerpts from the 2013 FTIP and 2013 FTIP Amendment #1 with the project information is provided in Appendix A.

Federal Statewide Transportation Improvement Plan

The Federal Statewide Transportation Improvements Plan (FSTIP) covers a four-year period from 2012/2013 through 2015/2016, which includes the listings of proposed transportation projects in the rural non MPO areas of the sate, and incorporates by reference projects listed in the MPO's 2013 FTIPs. Fresno COG submitted their board-approved 2013 FTIP to Caltrans, including 2013 FTIP Amendment #1 made August 2012. The FSTIP was transmitted from Caltrans to FHWA on November 5, 2012.

Transportation Conformity

The FHWA and FTA completed review of the conformity determination for the 2011 RTP and found that the document conforms to the applicable state implementation plan in accordance with the provisions of 40 CFR Parts 51 and 93. The FHWA and FTA issued the determination on December 14, 2010. The FHWA and FTA issued a determination of conformity for the 2011 RTP Amendment #2 on December 14, 2012. The transportation conformity determinations are provided in Appendix A.

The FHWA and FTA completed review of California's 2013 FSTIP, and approved the document as proposed. The FHWA and FTA determined the 2013 FSTIP conforms to the SIP on December 14, 2012. The 2013 FSTIP incorporated by reference those projects included in the 2012/2013 Federal Transportation Improvement Programs (FTIP) adopted by the MPOs in California. This conformity determination includes Fresno COG 2013 FTIP Amendment #1, which lists the project

2.1.4 - Pollutants of Concern

As described above, the Project area is designated nonattainment for the federal and State ozone and $PM_{2.5}$ standards. Because the area exceeds these health-based ambient air quality standards, ozone is the main criteria pollutants of concern for the Project area. The Project area is in attainment/ maintenance of the federal PM_{10} standards, but is nonattainment for the state's PM_{10} standard. In addition, asbestos and MSAT are generally a concern for construction projects. Other pollutants of concern are TACs and greenhouse gases.

The Project, as a 0.74-mile road reconstruction project, is not considered a source of potentially significant quantities of nitrogen dioxide, sulfur dioxide, lead, hydrogen sulfide, sulfates, or vinyl chloride; therefore, those pollutants are not included as "pollutants of concern" for the Project and are not included in the impact analysis.

The emissions sources and potential health effects of the pollutants of concern are described below. The discussions of properties and health effects below are based on sources including the Environmental Protection Agency and the California Air Resources Board.

Ozone

Ozone is not emitted directly into the air, but is a regional pollutant formed by a photochemical reaction in the atmosphere. Ozone precursors, which include reactive organic gases (ROG) and NO_X, react in the atmosphere in the presence of sunlight to form ozone. Because photochemical reaction rates depend on the intensity of ultraviolet light and air temperature, ozone is primarily a summer air pollution problem. Often, the effects of emitted ROG and NO_X are felt a distance downwind of the emission sources. Ozone is subsequently considered a regional pollutant. Ground-level ozone is a respiratory irritant and an oxidant that increases susceptibility to respiratory infections and can cause substantial damage to vegetation and other materials.

Ozone can irritate lung airways and cause inflammation much like sunburn. Other symptoms include wheezing, coughing, pain when taking a deep breath, and breathing difficulties during exercise or outdoor activities. People with respiratory problems are most vulnerable, but even healthy people who are active outdoors can be affected when ozone levels are high. Chronic ozone exposure can induce morphological (tissue) changes throughout the respiratory tract, particularly at the junction of the conducting airways and the gas exchange zone in the deep lung. Anyone who spends time outdoors in the summer is at risk, particularly children and other people who are more active outdoors. Even at very low levels, ground-level ozone triggers a variety of health problems, including aggravated asthma, reduced lung capacity, and increased susceptibility to such respiratory illnesses as pneumonia and bronchitis.

Ozone also damages vegetation and ecosystems. It leads to reduced agricultural crop and commercial forest yields; reduced growth and survivability of tree seedlings; and increased susceptibility to diseases, pests, and other stresses such as harsh weather. In addition, ozone causes damage to buildings, rubber, and some plastics.

Nitrogen Oxides

During combustion of fossil fuels, oxygen reacts with nitrogen to produce nitrogen oxides or NO_X. This occurs primarily in motor vehicle internal combustion engines and fossil fuel-fired electric utility facilities and industrial boilers. The pollutant NO_X is a concern because it is an ozone precursor, which means that it helps form ozone. When NO_X and ROG are released in the atmosphere, they can chemically react with one another in the presence of sunlight and heat to form ozone. NO_X can also be a precursor to PM_{10} and $PM_{2.5}$.

Because NO_X and ROG are ozone precursors, the health effects associated with ozone (as discussed above) are also indirect health effects associated with significant levels of NO_X and ROG emissions.

Reactive Organic Gases and Volatile Organic Compounds

ROG, also known as volatile organic compounds (VOC) are defined as any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, which participate in atmospheric photochemical reactions. ROG consist of nonmethane hydrocarbons and oxygenated hydrocarbons. Hydrocarbons are organic compounds that contain only hydrogen and carbon atoms. Nonmethane hydrocarbons are hydrocarbons that do not contain the unreactive hydrocarbon methane. Oxygenated hydrocarbons are hydrocarbons with oxygenated functional groups attached.

There are no state or national ambient air quality standards for ROG because they are not classified as criteria pollutants. They are regulated, however, because a reduction in ROG emissions reduces certain chemical reactions that contribute to the formulation of ozone. ROG also are transformed into organic aerosols in the atmosphere, which contribute to higher PM_{10} levels and lower visibility.

Particulate Matter (PM_{10} and $PM_{2.5}$)

PM is the term for a mixture of solid particles and liquid droplets found in the air. Some particles, such as dust, dirt, soot, or smoke, are large or dark enough to be seen with the naked eye. Others are so small they can only be detected using an electron microscope.

Particle pollution includes “inhalable coarse particles,” with diameters larger than 2.5 micrometers and smaller than 10 micrometers and “fine particles,” with diameters that are 2.5 micrometers and smaller. For reference, $PM_{2.5}$ is approximately one-thirtieth the size of the average human hair.

These particles come in many sizes and shapes and can be made up of hundreds of different chemicals. Some particles, known as primary particles, are emitted directly from a source, such as construction sites, unpaved roads, fields, smokestacks, or fires. Others form in complicated reactions in the atmosphere from chemicals such as sulfur dioxides and nitrogen oxides that are emitted from power plants, industrial activity, and automobiles. These particles, known as secondary particles, make up most of the fine particle pollution in the United States.

Particle exposure can lead to a variety of health effects. For example, numerous studies link particle levels to increased hospital admissions and emergency room visits—and even to death from heart or lung diseases. Both long- and short-term particle exposures have been linked to health problems. Long-term exposures, such as those experienced by people living for many years in areas with high particle levels, have been associated with problems such as reduced lung function, the development of chronic bronchitis, and even premature death. Short-term exposures to particles (hours or days) can aggravate lung disease, causing asthma attacks and acute bronchitis, and may increase susceptibility to respiratory infections. In people with heart disease, short-term exposures have been linked to heart attacks and arrhythmias. Healthy children and adults have not been reported to suffer serious effects from short-term exposures, although they may experience temporary minor irritation when particle levels are elevated.

Carbon Monoxide

CO is a colorless, odorless gas that is formed when carbon in fuel is not burned completely. It is a component of motor vehicle exhaust, which contributes about 56 percent of all CO emissions nationwide. Higher levels of CO generally occur in areas with heavy traffic congestion.

CO is a public health concern because it combines readily with hemoglobin, reducing the amount of oxygen transported in the bloodstream. High levels of CO can affect even healthy people. At extremely high levels, CO is poisonous and can cause death.

Motor vehicles are the dominant source of CO emissions in most areas. CO is described as having only a local influence because it dissipates quickly. High CO levels develop primarily during winter, when periods of light winds combine with the formation of ground-level temperature inversions (typically from the evening through early morning). These conditions result in reduced dispersion of vehicle emissions. Because CO is a product of incomplete combustion, motor vehicles exhibit increased CO emission rates at low air temperatures. High CO concentrations occur in areas of limited geographic size, sometimes referred to as hot spots.

Toxic Air Contaminants

In addition to the above-listed criteria pollutants, toxic air contaminants (TACs), also known as hazardous air pollutants, are another group of pollutants of concern. A TAC is defined as an air pollutant that may cause or contribute to an increase in mortality or serious illness, or that may pose a hazard to human health. TACs are usually present in minute quantities in the ambient air; however, their high toxicity or health risk may pose a threat to public health even at low concentrations. In general, for those TACs that may cause cancer, there is no concentration that does not present some risk. In other words, there is no threshold level below which adverse health impacts are not expected to occur. This contrasts with the criteria pollutants for which acceptable levels of exposure can be determined and for which the state and federal governments have set ambient air quality standards.

According to the California Almanac of Emissions and Air Quality, the majority of the estimated health risk from TACs can be attributed to relatively few compounds, the most important being diesel particulate matter (DPM) from diesel-fueled engines (ARB 2009). Asbestos is a concern for construction projects. However, City of Fresno does not contain known potential for naturally occurring asbestos (NOA). Therefore, NOA is not a concern for the Project, and is not discussed in this section.

Mobile Source Air Toxics

MSAT are a subset of the 188 air toxics defined by the CAA. The MSATs are compounds emitted from highway vehicles and non-road equipment. Of the 21 identified MSAT compounds, the EPA has listed seven as “priority” MSATs: benzene, formaldehyde, DPM/diesel exhaust organic gases, acrolein, 1,3-butadiene, naphthalene, and polycyclic organic matter.

Diesel Particulate Matter

The ARB identified the PM emissions from diesel-fueled engines as a TAC in August 1998 under California's TAC program. The State of California, after a 10-year research program, determined in 1998 that DPM from diesel-fueled engines is a human carcinogen and that chronic (long-term) inhalation exposure to DPM poses a chronic (long-term) health risk. The California Office of Environmental Health Hazard Assessment recommends using a 70-year exposure duration for determining residential cancer risks. DPM is emitted from both mobile and stationary sources. In California, on-road diesel-fueled vehicles contribute approximately 40 percent of the statewide total, with an additional 57 percent attributed to other mobile sources such as construction and mining equipment, agricultural equipment, and transport refrigeration units.

2.2 - Climate Change and Greenhouse Gases

2.2.1 - Federal

Although climate change and greenhouse gas reduction is a concern at the federal level; currently there are no regulations or legislation that have been enacted specifically addressing greenhouse gas emissions reductions and climate change at the project level for transportation projects. Neither the United States Environmental Protection Agency (EPA) nor Federal Highway Administration (FHWA) has promulgated explicit guidance or methodology to conduct project-level greenhouse gas analysis. As stated on FHWA's climate change website (http://www.fhwa.dot.gov/hep/climate/index.htm), climate change considerations should be integrated throughout the transportation decision-making process—from planning through project development and delivery. Addressing climate change mitigation and adaptation up front in the planning process will facilitate decision-making and improve efficiency at the program level, and will inform the analysis and stewardship needs of project level decision-making. Climate change considerations can easily be integrated into many planning factors, such as supporting economic vitality and global efficiency, increasing safety and mobility, enhancing the environment, promoting energy conservation, and improving the quality of life.

The four strategies set forth by FHWA to lessen climate change impacts do correlate with efforts that the State has undertaken and is undertaking to deal with transportation and climate change; the strategies include improved transportation system efficiency, cleaner fuels, cleaner vehicles, and reduction in the growth of vehicle hours traveled.

Climate change and its associated effects are also being addressed through various efforts at the federal level to improve fuel economy and energy efficiency, such as the "National Clean Car Program" and Executive Order 13514- Federal Leadership in Environmental, Energy and Economic Performance.

Executive Order 13514 is focused on reducing greenhouse gases internally in federal agency missions, programs and operations, but also direct federal agencies to participate in the interagency

Climate Change Adaptation Task Force, which is engaged in developing a U.S. strategy for adaptation to climate change.

On April 2, 2007, in Massachusetts v. EPA, 549 U.S. 497 (2007), the Supreme Court found that greenhouse gases are air pollutants covered by the Clean Air Act and that the EPA has the authority to regulate greenhouse gases. The Court held that the EPA Administrator must determine whether or not emissions of greenhouse gases from new motor vehicles cause or contribute to air pollution, which may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision.

On December 7, 2009, the EPA Administrator signed two distinct findings regarding greenhouse gases under section 202(a) of the Clean Air Act:

- Endangerment Finding: The Administrator found that the current and projected concentrations of the six key well-mixed greenhouse gases--carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6)--in the atmosphere threaten the public health and welfare of current and future generations.
- Cause or Contribute Finding: The Administrator found that the combined emissions of these well-mixed greenhouse gases from new motor vehicles and new motor vehicle engines contribute to the greenhouse gas pollution, which threatens public health and welfare.

Although these findings did not themselves impose any requirements on industry or other entities, this action was a prerequisite to finalizing the EPA's Proposed Greenhouse Gas Emission Standards for Light-Duty Vehicles, which was published on September 15, 2009. On May 7, 2010 the final Light-Duty Vehicle Greenhouse Gas Emissions Standards and Corporate Average Fuel Economy Standards was published in the Federal Register.

EPA and the National Highway Traffic Safety Administration (NHTSA) are taking coordinated steps to enable the production of a new generation of clean vehicles with reduced greenhouse gas emissions and improved fuel efficiency from on-road vehicles and engines. These next steps include developing the first-ever greenhouse gas regulations for heavy-duty engines and vehicles, as well as additional light-duty vehicle greenhouse gas regulations. These steps were outlined by President Obama in a memorandum on May 21, 2010.

The final combined EPA and NHTSA standards that make up the first phase of this national program apply to passenger cars, light-duty trucks, and medium-duty passenger vehicles, covering model years 2012 through 2016. The standards require these vehicles to meet an estimated combined average emissions level of 250 grams of carbon dioxide per mile, equivalent to 35.5 miles per gallon if the automobile industry were to meet this carbon dioxide level solely through fuel economy improvements. Together, these standards will cut greenhouse gas emissions by an estimated 960

million metric tons and 1.8 billion barrels of oil over the lifetime of the vehicles sold under the program (model years 2012-2016).

On January 24, 2011, the EPA along with the U.S. Department of Transportation and the State of California announced a single timeframe for proposing fuel economy and greenhouse gas standards for model years 2017-2025 cars and light-trucks. Proposing the new standards in the same timeframe (September 1, 2011) signals continued collaboration that could lead to an extension of the current National Clean Car Program.

Council on Environmental Quality. On February 18, 2010, the Council on Environmental Quality (CEQ) provided a draft guidance memorandum for public consideration and comment on the ways in which federal agencies can improve their consideration of the effects of greenhouse gas emissions and climate change in evaluations of proposals for federal actions under NEPA (CEQ 2010).

CEQ proposes to advise federal agencies to consider, in scoping their NEPA analyses, whether analysis of the direct and indirect greenhouse gas emissions from their proposed actions may provide meaningful information to decision makers and the public. Specifically, if a proposed action would be reasonably anticipated to cause direct emissions of 25,000 metric tons or more of carbon dioxide equivalent greenhouse gas emissions on an annual basis, agencies should consider this an indicator that a quantitative and qualitative assessment may be meaningful to decision makers and the public. For long-term actions that have annual direct emissions of less than 25,000 metric tons of carbon dioxide equivalent, CEQ encourages federal agencies to consider whether the action's long-term emissions should receive similar analysis. CEQ does not propose this as an indicator of a threshold of significant effects, but rather as an indicator of a minimum level of greenhouse gas emissions that may warrant some description in the appropriate NEPA analysis for agency actions involving direct emissions of greenhouse gases.

2.2.2 - State

There have been significant legislative and regulatory activities that affect climate change and greenhouse gases in California. Legislative and regulatory activities pertinent to transportation are discussed below.

Assembly Bill 1493 (AB 1493), Pavley. Vehicular Emissions: Greenhouse Gases (AB 1493), 2002: requires the ARB to develop and implement regulations to reduce automobile and light truck greenhouse gas emissions. These stricter emissions standards were designed to apply to automobiles and light trucks beginning with the 2009-model year. In June 2009, the EPA Administrator granted a Clean Air Act waiver of preemption to California. This waiver allowed California to implement its own greenhouse gas emission standards for motor vehicles beginning with model year 2009. California agencies will be working with Federal agencies to conduct joint rulemaking to reduce greenhouse gas emissions for passenger cars model years 2017-2025.

Executive Order S-3-05: (signed on June 1, 2005, by Governor Arnold Schwarzenegger) the goal of this Executive Order is to reduce California's greenhouse gas emissions to: 1) 2000 levels by 2010, 2) 1990 levels by the 2020 and 3) 80 percent below the 1990 levels by the year 2050. In 2006, this goal was further reinforced with the passage of Assembly Bill 32.

AB32 (AB 32), the Global Warming Solutions Act of 2006: AB 32 sets the same overall greenhouse gas emissions reduction goals as outlined in Executive Order S-3-05, while further mandating that ARB create a plan, which includes market mechanisms, and implement rules to achieve "real, quantifiable, cost-effective reductions of greenhouse gases." Executive Order S-20-06 further directs state agencies to begin implementing AB 32, including the recommendations made by the State's Climate Action Team.

Executive Order S-01-07: Governor Schwarzenegger set forth the low carbon fuel standard for California. Under this Executive Order, the carbon intensity of California's transportation fuels is to be reduced by at least ten percent by 2020.

Senate Bill 97 (Chapter 185, 2007): required the Governor's Office of Planning and Research (OPR) to develop recommended amendments to the State CEQA Guidelines for addressing greenhouse gas emissions. The Amendments became effective on March 18, 2010.

Senate Bill 375: SB 375 states, "Without improved land use and transportation policy, California will not be able to achieve the goals of AB 32." SB 375 contains the following:

- Requires MPOs to include sustainable community strategies in their regional transportation plans for reducing greenhouse gas emissions,
- Aligns planning for transportation and housing, and
- Creates specified incentives for the implementation of the strategies. Concerning CEQA, SB 375, section 21159.28 states that CEQA findings determinations for certain projects are not required to reference, describe, or discuss growth inducing impacts or any project-specific or cumulative impacts from cars and light-duty truck trips generated by a project on global warming or the regional transportation network if the project:
  - Is in an area with an approved sustainable communities strategy or an alternative planning strategy that the ARB accepts as achieving the greenhouse gas emission reduction targets;
  - Is consistent with that strategy (in designation, density, building intensity, and applicable policies); and
  - Incorporates the mitigation measures required by an applicable prior environmental document.

Caltrans

Caltrans continues to be actively involved on the Governor's Climate Action Team as ARB works to implement the Executive Orders S-3-05 and S-01-07 and help achieve the targets set forth in AB 32.

Many of the strategies Caltrans is using to help meet the targets in AB 32 come from the California Strategic Growth Plan, which is updated each year. Former Governor Arnold Schwarzenegger's Strategic Growth Plan calls for a $222 billion infrastructure improvement program to fortify the state's transportation system, education, housing, and waterways, including $100.7 billion in transportation funding during the next decade. The Strategic Growth Plan targets a significant decrease in traffic congestion below today's level and a corresponding reduction in greenhouse gas emissions. The Strategic Growth Plan proposes to do this while accommodating growth in population and the economy. A suite of investment options has been created that combined together are expected to reduce congestion. The Strategic Growth Plan relies on a complete systems approach to attain CO_2 reduction goals: system monitoring and evaluation, maintenance and preservation, smart land use and demand management, and operational improvements.

Caltrans is supporting efforts to reduce vehicle miles traveled by planning and implementing smart land use strategies: job/housing proximity, developing transit-oriented communities, and high-density housing along transit corridors. Caltrans is working closely with local jurisdictions on planning activities; however, Caltrans does not have local land use planning authority. Caltrans is also supporting efforts to improve the energy efficiency of the transportation sector by increasing vehicle fuel economy in new cars, light and heavy-duty trucks; Caltrans is doing this by supporting on-going research efforts at universities, by supporting legislative efforts to increase fuel economy, and by its participation on the Climate Action Team. It is important to note, however, that the control of the fuel economy standards is held by EPA and ARB. Lastly, the use of alternative fuels is also being considered; Caltrans is participating in funding for alternative fuel research at the UC Davis.

Table 9 summarizes Caltrans and statewide efforts that Caltrans is implementing in order to reduce greenhouse gas emissions. More detailed information about each strategy is included in the Climate Action Program at Caltrans (December 2006).

Table 9: Caltrans Climate Change / CO_2 Reduction Strategies

Strategy	Program	Partnership		Method/Process	Estimated CO_2 Savings (MMT)	
		Lead	Agency		2010	2020
Smart Land Uses	Intergovernmental Review (IGR)	Caltrans	Local Governments	Review and seek to mitigate development proposals	Not Estimated	Not Estimated
	Planning Grants	Caltrans	Local and regional agencies & other stakeholders	Competitive selection process	Not Estimated	Not Estimated
	Regional Plans and Blueprint Planning	Regional Agencies	Caltrans	Regional plans and application process	0.975	7.8
Operational Improvements & Intelligent Trans. System (ITS) Deployment	Strategic Growth Plan	Caltrans	Regions	State ITS; Congestion Management Plan	.07	2.17
Mainstream Energy & Greenhouse Gas into Plans and Projects	Office of Policy Analysis & Research; Division of Environmental Analysis	Interdepartmental effort		Policy establishment, guidelines, technical assistance	Not Estimated	Not Estimated
Educational & Information Program	Office of Policy Analysis & Research	Interdepartmental, CalEPA, ARB, CEC		Analytical report, data collection, publication, workshops, outreach	Not Estimated	Not Estimated
Fleet Greening & Fuel Diversification	Division of Equipment	Department of General Services		Fleet Replacement B20 B100	0.0045	0.0065 0.045 0.0225
Non-vehicular Conservation Measures	Energy Conservation Program	Green Action Team		Energy Conservation Opportunities	0.117	.34
Portland Cement	Office of Rigid Pavement	Cement and Construction Industries		2.5 % limestone cement mix 25% fly ash cement mix > 50% fly ash/slag mix	1.2 0.36	4.2 3.6
Goods Movement	Office of Goods Movement	Cal EPA, ARB, BT&H, MPOs		Goods Movement Action Plan	Not Estimated	Not Estimated
Total					2.72	18.18

Acronyms:
$MMTCO_2e$ = Million metric tons of carbon dioxide equivalent
Source: Caltrans 2006.

2.2.3 - Local Agencies

San Joaquin Valley Air Pollution Control District

On December 17, 2009, the SJVAPCD Governing Board adopted "Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA" and the policy: "District Policy - Addressing GHG Emission Impacts for Stationary Source Projects Under CEQA When Serving as the Lead Agency." The SJVAPCD concluded that the existing science is inadequate to support quantification of the impacts that project-specific greenhouse gas emissions have on global climatic change. The SJVAPCD found that the effects of project-specific emissions to be cumulative, and without mitigation, their incremental contribution to global climatic change could be considered cumulatively considerable. The SJVAPCD found that this cumulative impact is best addressed by requiring all projects to reduce their greenhouse gas emissions, whether through project design elements or mitigation.

The SJVAPCD's approach is intended to streamline the process of determining if project-specific greenhouse gas emissions would have a significant effect. Projects exempt from the requirements of CEQA, and projects complying with an approved plan or mitigation program would be determined to have a less than significant cumulative impact. Such plans or programs must be specified in law or adopted by the public agency with jurisdiction over the affected resources and have a certified Final CEQA document.

For non-exempt projects, those projects for which there is no applicable approved plan or program, or those projects not complying with an approved plan or program, the lead agency would evaluate the project against a performance-based standards and would require the adoption of design elements, known as a Best Performance Standard, to reduce greenhouse gas emissions. The Best Performance Standards have not yet fully been established, though they must be designed to effect a 29-percent reduction when compared with the "business-as-usual" projections identified in ARB's AB 32 Scoping Plan.

"Business-as-usual" is the emissions occurring in 2020 if the average baseline emissions during the 2002-2004 period were grown to 2020 levels, without control. These standards thus would carry with them pre-quantified emissions reductions, eliminating the need for project specific quantification. Therefore, projects incorporating Best Performance Standards would not require specific quantification of greenhouse gas emissions, and automatically would be determined to have a less than significant cumulative impact for greenhouse gas emissions.

For stationary source permitting projects, Best Performance Standards means, "The most stringent of the identified alternatives for control of greenhouse gas emissions, including type of equipment, design of equipment and operational and maintenance practices, which are achieved-in-practice for the identified service, operation, or emissions unit class." The SJVAPCD has identified Best Performance Standards for the following sources: boilers; dryers and dehydrators; oil and gas

extraction, storage, transportation, and refining operations; cogeneration; gasoline dispensing facilities; volatile organic compound control technology; and steam generators.

For development projects, Best Performance Standards means, "Any combination of identified greenhouse gas emission reduction measures, including project design elements and land use decisions that reduce project specific greenhouse gas emission reductions by at least 29 percent compared with business as usual."

Projects not incorporating Best Performance Standards would require quantification of greenhouse gas emissions and demonstration that business-as-usual greenhouse gas emissions have been reduced or mitigated by 29 percent. Quantification of greenhouse gas emissions would be required for all projects for which the lead agency has determined that an environmental impact report is required, regardless of whether the project incorporates Best Performance Standards.

Fresno Council of Governments

Fresno COG is currently working on the 2014 Regional Transportation Plan Sustainable Communities Strategy (SCS), which addresses greenhouse gas emissions reductions and other air emissions. SCS regional plans consider long-term housing, transportation and land use needs, and are being coordinated by the 8 San Joaquin Valley Air Basin MPOs.

City of Fresno

The City is working with a consultant to prepare a Climate Action Plan for municipal and community-wide sources. Although the City has made progress in the preparation of the Climate Action Plan, a draft plan has not been released as of the date of this document.

2.2.4 - Pollutants of concern

Gases that trap heat in the atmosphere are greenhouse gases, analogous to the way a greenhouse retains heat. The accumulation of greenhouse gases in the atmosphere regulates the earth's temperature. However, human activities have increased the amount of greenhouse gases in the atmosphere. Some greenhouse gases can remain in the atmosphere for hundreds of years. The following greenhouse gases are defined under Assembly Bill 32 but are not expected to be generated by the Project: chlorofluorocarbons, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride.

Individual greenhouse gas compounds have varying global warming potential and atmospheric lifetimes. The global warming potential of a greenhouse gas is a measure of how much a given mass of a greenhouse gas is estimated to contribute to global warming. To describe how much global warming a given type and amount of greenhouse gas may cause, use is made of a metric called the carbon dioxide equivalent.

The calculation of the carbon dioxide equivalent is a consistent methodology for comparing greenhouse gas emissions since it normalizes various greenhouse gas emissions to a consistent

reference gas, carbon dioxide. Carbon dioxide, the reference gas for global warming potential, has a global warming potential of one. For example, methane's warming potential of 21 indicates that methane has a 21 times greater warming affect than carbon dioxide on a molecule per molecule basis. A carbon dioxide equivalent is the mass emissions of an individual greenhouse gas multiplied by its global warming potential. The following is a brief description of the most common greenhouse gases that may be emitted by the Project.

Carbon dioxide. Carbon dioxide (CO_2) is an odorless, colorless natural greenhouse gas. CO_2 is emitted from natural and anthropogenic sources. Natural sources include the following: decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungus; evaporation from oceans; and volcanic outgassing. Anthropogenic sources are from burning coal, oil, natural gas, gasoline, and wood. As discussed above, CO_2 has a global warming potential of 1.

Methane. Methane is a flammable greenhouse gas. A natural source of methane is from the anaerobic decay of organic matter. Geological deposits, known as natural gas fields, also contain methane, which is extracted for fuel. Other sources are from landfills, fermentation of manure, and ruminants such as cattle. Methane has a global warming potential of 21.

Nitrous oxide. Nitrous oxide, also known as laughing gas, is a colorless greenhouse gas. Nitrous oxide is produced by microbial processes in soil and water, including those reactions that occur in fertilizer containing nitrogen. In addition to agricultural sources, some industrial processes (fossil fuel-fired power plants, nylon production, nitric acid production, and vehicle emissions) also contribute to its atmospheric load. Nitrous oxide is a highly potent greenhouse gas with a global warming potential of 310.

SECTION 3: PHYSICAL SETTING

The Project is located in the City of Fresno, in Fresno County, in the San Joaquin Valley Air Basin (Air Basin). The Air Basin consists of Kings Madera, San Joaquin, Merced, Stanislaus, and Fresno counties; as well as a portion of Kern County. The local agency with jurisdiction over air quality in the Basin is the San Joaquin Valley Air Pollution Control District (SJVAPCD). Regional and local air quality is impacted by topography, dominant airflows, atmospheric inversions, location, and season.

3.1.1 - Regional Air Quality

The information in this section is primarily from the SJVAPCD's Guide for Assessing and Mitigating Air Quality Impacts and the accompanying Technical Document (San Joaquin Valley Air Pollution Control District 2002).

The Air Basin has an "inland Mediterranean" climate and is characterized by long, hot, dry summers and short, foggy winters. Sunlight can be a catalyst in the formation of some air pollutants (such as ozone); the Air Basin averages over 260 sunny days per year.

The Air Basin is generally shaped like a bowl. It is open in the north and is surrounded by mountain ranges on all other sides. The Sierra Nevada mountains are along the eastern boundary (8,000 to 14,000 feet in elevation), the Coast Ranges are along the western boundary (3,000 feet in elevation), and the Tehachapi Mountains are along the southern boundary (6,000 to 8,000 feet in elevation).

Dominant Airflow

Dominant airflows provide the driving mechanism for transport and dispersion of air pollution. The mountains surrounding the Air Basin form natural horizontal barriers to the dispersion of air contaminants. The wind generally flows south-southeast through the valley, through the Tehachapi Pass and into the Southeast Desert Air Basin portion of Kern County. As the wind moves through the Air Basin, it mixes with the air pollution generated locally, generally transporting air pollutants from the north to the south in the summer and in a reverse flow in the winter.

Inversions

Generally, the temperature of air decreases with height, creating a gradient from warmer air near the ground to cooler air at elevation. This gradient of cooler air over warm air is known as the environmental lapse rate. Inversions occur when warm air sits over cooler air, trapping the cooler air near the ground. These inversions trap pollutants from dispersing vertically, and the mountains surrounding the San Joaquin Valley trap the pollutants from dispersing horizontally. Strong temperature inversions occur throughout the Air Basin in the summer, fall, and winter. Daytime temperature inversions occur at elevations of 2,000 to 2,500 feet above the San Joaquin Valley floor during the summer and at 500 to 1,000 feet during the winter.

The result is a relatively high concentration of air pollution in the valley during inversion episodes. These inversions cause haziness, which in addition to moisture may include suspended dust, a variety of chemical aerosols emitted from vehicles, particulates from wood stoves, and other pollutants. In the winter, these conditions can lead to CO "hot-spots" along heavily traveled roads and at busy intersections. During summer's longer daylight hours, stagnant air, high temperatures, and plentiful sunshine provide the conditions and energy for the photochemical reaction between ROG and NO_x, which results in the formation of ozone.

Location and Season

Because of the prevailing daytime winds and time-delayed nature of ozone, concentrations are highest in the southern portion of the Air Basin, such as around Bakersfield. Summers are often periods of hazy visibility and occasionally unhealthful air, while winter air quality impacts tend to be localized and can consist of (but are not exclusive to) odors from agricultural operations; soot or smoke around residential, agricultural, and hazard-reduction wood burning; or dust near mineral resource recovery operations.

Emissions Inventory

Background

An emissions inventory is an account of the amount of air pollution generated by various emissions sources. To estimate the sources and quantities of pollution, ARB, in cooperation with local air districts, other government agencies, and industry, maintains an inventory of California emission sources. Sources are subdivided into the four major emission categories: mobile, stationary, area-wide, and natural sources.

Mobile sources include on-road sources and off-road mobile sources. The on-road emissions inventory, which includes automobiles, motorcycles, and trucks, is based on an estimation of population, activity, and emissions of the on-road motor vehicles used in California. The off-road emissions inventory is based on an estimate of the population, activity, and emissions of various off-road equipment, including recreational vehicles, farm and construction equipment, lawn and garden equipment, forklifts, locomotives, commercial marine ships, and marine pleasure craft.

Stationary sources are large, fixed sources of air pollution, such as power plants, refineries, and manufacturing facilities. Stationary sources also include aggregated point sources. These include many small point sources, or facilities, that are not inventoried individually but are estimated as a group and reported as a single-source category. Examples include gas stations and dry cleaners. Each of the local air districts estimates the emissions for the majority of stationary sources within its jurisdiction. Stationary source emissions are based on estimates made by facility operators and local air districts. Emissions from specific facilities can be identified by name and location.

Area-wide sources include source categories associated with human activity that take place over a wide geographic area. Emissions from area-wide sources may be either from small, individual

sources, such as residential fireplaces, or from widely distributed sources that cannot be tied to a single location, such as consumer products, and dust from unpaved roads or farming operations (such as tilling).

Natural, or non-anthropogenic, sources include source categories with naturally occurring emissions such as geogenic (e.g., petroleum seeps), wildfires, and biogenic emissions from plants.

Emissions Inventory

The 2008 emissions inventory for the Fresno County portion of the Air Basin is available in ARB's 2009 Almanac Emission Projection Data. In the Project area, mobile emissions are the primary source of local pollution, accounting for approximately 63 percent of CO, 79 percent of oxides of nitrogen (NO_x), and 21 percent of reactive organic gases (ROG). For PM_{10} and $PM_{2.5}$, the majority of emissions are generated by area sources. Table 10 summarizes the estimated 2008 emissions for the main pollutants of concern in the area.

Table 10: 2008 Inventory Fresno County

Emission Category	Tons per Day				
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$
Stationary Sources	16.7	8.9	16.6	4.2	2.9
Area-wide Sources	36.3	110.3	6.9	72.0	21.7
Mobile Sources	30.6	232.0	88.9	4.4	3.7
Natural Sources	63.9	14.6	0.5	1.5	1.3
Total	147.4	365.9	112.9	82.1	29.5
Source: ARB 2013.					

3.1.2 - Local Air Quality

Climate and Meteorology

The Fresno meteorological station is located in the Project vicinity. Weather data from this station shows an annual average temperatures in the area from an average monthly high of 98.3 degrees Fahrenheit (ºF) in June to an average monthly low of 37.3 ºF in December and January. The average annual rainfall in the Project area, as recorded between 1948 and 2013, is 10.89 inches (WRCC 2013).

Air Quality

The local air quality can be evaluated by reviewing relevant air pollution concentrations near the Project area. The SJVAPCD operates an air monitoring station on Drummond Street, located south of East Jenson Avenue Bypass between Maple Avenue and Chestnut Avenue, approximately 3.2 miles southeast of the Project. The Drummond Street ambient air monitoring station (Drummond Station) measures 1 hour and 8-hour ozone, daily PM_{10}, 8-hour CO, and 1-hour NO_2. As CO is a highly localized pollutant, the data from the Drummond station would not be applicable to the Project area.

The North 1st Street and Garland Avenue monitoring stations measure PM2.5 and are located approximately 3.5 miles northeast of the project site. The North 1st Street monitoring station was recently closed and replaced by the Garland Avenue monitoring station. Table 11 summarizes 2010 through 2010 published monitoring data from ARB's Aerometric Data Analysis and Management System (iADAM) for the Drummond Station, North 1st Station and Garland Avenue Station. The PM2.5 measurements for 2010 and 2011 are from the North 1st Station, and the 2012 measurement is from the Garland Station. .

Table 11: Air Quality Monitoring Summary

Air Pollutant	Averaging Time	Metric	Year		
			2010	2011	2012
Ozone	1 Hour	Max 1 Hour (ppm)	0.108	0.129	0.127
		Days > CAAQS (0.09 ppm)	5	27	9
	8 Hour	Max 8 Hour (ppm)[1]	0.092	0.105	0.108
		Days > CAAQS (0.07 ppm)	24	73	75
		Days > NAAQS (0.075 ppm)	13	52	46
Particulate matter (PM_{10})	24 Hour	Federal Annual Average ($\mu g/m^3$)	26.9	31.4	42.9
		Max 24 Hour ($\mu g/m^3$)	66.5	91.3	114.3
		Est. Days > CAAQS (50 $\mu g/m^3$)	*	72.0	*
		Est. Days > NAAQS (150 $\mu g/m^3$)	*	0.0	*
Fine particulate matter ($PM_{2.5}$)	Annual	Annual Average ($\mu g/m^3$)	13.0	15.4	14.0
	24 Hour	Max 24 Hour ($\mu g/m^3$)[2]	62.0	78.5	88.8
		Est. Days > National Standard (35 $\mu g/m^3$)	21.7	39.0	29.4
Carbon monoxide (CO)	8 Hour	Max 8 Hour (ppm)	1.45	1.73	*
		Days > State Standard (9.0 ppm)	0	0	0
		Days > National Standard (9 ppm)	0	0	0
Nitrogen dioxide (NO_2)	Annual	Annual Average (ppm)	*	0.013	*
	1 Hour	Max 1 Hour (ppm)	0.062	0.069	*
		Days > State Standard (0.18 ppm)	0	0	0

Abbreviations:
> = exceed ppm = parts per million $\mu g/m^3$ = micrograms per cubic meter
* = Insufficient/No Data Max = maximum Est. = Estimated
CAAQS = California ambient air quality standards
NAAQS = National ambient air quality standards
[1] From the California Measurement
[2] Federal Annual Average
Source: ARB 2013.

Local Sources of Air Pollution

The adjacent land uses are dominated by commercial, retail development, and government facilities which generate mobile and area source emissions. State Route 99 is located approximately 0.4 mile west of the Project's western terminus. State Route 41 is located approximately 0.3 mile south and southeast of the project's southern terminus.

Sensitive Receptors

Those individuals who are sensitive to air pollution include children, the elderly, and persons with pre-existing respiratory or cardiovascular illness. The SJVAPCD considers a sensitive receptor to be a location that houses or attracts children, the elderly, people with illnesses, or others who are especially sensitive to the effects of air pollutants. Examples of sensitive receptors include hospitals, residences, convalescent facilities, and schools. There are three apartment buildings in the vicinity of the project. The residential locations the Masten Towers, Hotel Californian, and the Pacific Southwest Building.

- **Masten Towers** is located at the northeast corner of Fresno Street and Broadway Street includes 200 units with one bedroom and studio apartments. Ten percent of the apartments (20 units) accommodate persons with physical disabilities (Masten Towers 2013).
- The **Hotel Californian** is at the southwest corner of Kern Street and Van Ness Avenue has 217 rooms. Currently, the building provides housing for low-income seniors (Balch 2013).
- The **Pacific Southwest Building** is located at the southeast corner of Mariposa Mall and Fulton Mall accommodates approximately 12 people in 8 units. Currently, the housing is provided to above moderate income persons. Residential units are located on the 10th floor and greater (Balch 2013).

3.1.3 - Greenhouse Gas Emissions and Climate Change

Climate change refers to long-term changes in temperature, precipitation, wind patterns, and other elements of the earth's climate system. An ever-increasing body of scientific research attributes these climatological changes to greenhouse gases, particularly those generated from the production and use of fossil fuels.

While climate change has been a concern for several decades, the establishment of the Intergovernmental Panel on Climate Change (IPCC) by the United Nations and World Meteorological Organization's in 1988, has led to increased efforts devoted to greenhouse gas emissions reduction and climate change research and policy. These efforts are primarily concerned with the emissions of greenhouse gases related to human activity that include carbon dioxide (CO_2), methane, nitrous oxide, tetrafluoromethane, hexafluoroethane, sulfur hexafluoride, HFC-23 (fluoroform), HFC-134a (s, s, s, 2 -tetrafluoroethane), and HFC-152a (difluoroethane)..

Transportation sources (passenger cars, light duty trucks, other trucks, buses and motorcycles) in the state of California make up the largest source (second to electricity generation) of greenhouse gas emitting sources. Conversely, the main source of greenhouse gas emissions in the United States (U.S.) is electricity generation followed by transportation. The dominant greenhouse gas emitted is CO_2, mostly from fossil fuel combustion.

There are four primary strategies for reducing greenhouse gas emissions from transportation sources: 1) improve system and operation efficiencies, 2) reduce growth of vehicle miles traveled (VMT) 3) transition to lower greenhouse gas fuels and 4) improve vehicle technologies. To be most effective all four should be pursued collectively. The following regulatory setting section outlines state and federal efforts to comprehensively reduce greenhouse gas emissions from transportation sources.

Potential Environmental Effects

Worldwide, average temperatures are likely to increase by 1.8 degrees Celsius (°C) to 4°C, or approximately 3 °F to 7°F by the end of the 21st century (IPCC 2007). However, a global temperature increase does not translate to a uniform increase in temperature in all locations on the earth. Regional climate changes are dependent on multiple variables, such as topography. One region of the Earth may experience increased temperature, increased incidents of drought and similar warming effects, whereas another region may experience a relative cooling. According to the Intergovernmental Panel on Climate Change's Working Group II Report, climate change impacts to North America may include diminishing snowpack, increasing evaporation, exacerbated shoreline erosion, exacerbated inundation from sea level rising, increased risk and frequency of wildfire, increased risk of insect outbreaks, increased experiences of heat waves, and rearrangement of ecosystems, as species and ecosystem zones shift northward and to higher elevations (IPCC 2007).

For California, climate change has the potential to incur/exacerbate the following environmental impacts (CAT 2006):

- Reduced precipitation;
- Changes to precipitation and runoff patterns;
- Reduced snowfall (precipitation occurring as rain instead of snow);
- Earlier snowmelt;
- Decreased snowpack;
- Increased agricultural demand for water;
- Intrusion of seawater into coastal aquifers;
- Increased agricultural growing season;
- Increased growth rates of weeds, insect pests and pathogens;
- Inundation of low-lying coastal areas by sea level rise;
- Increased incidents and severity of wildfire events; and,
- Expansion of the range and increased frequency of pest outbreaks.

Although certain environmental effects are widely accepted to be a potential hazard to certain locations, such as rising sea level for low-laying coastal areas, it is currently infeasible to predict all environmental effects of climate change on any one location.

SECTION 4: IMPACT ANALYSIS

4.1 - Transportation Conformity Impacts

4.1.1 - Regional Conformity

To determine if a project is exempt from regional conformity, 40 CFR 93.127 contains a list of projects that are except from regional emissions analyses. The Project is not exempt from regional emissions analysis. Therefore, the Project's consistency with the applicable Regional Transportation Plan (RTP) and Federal Transportation Improvement Program (FTIP) is provided below.

Regional Transportation Plan

The Project was included in the regional emissions analysis conducted by Fresno COG for the conforming 2011 Regional Transportation Plan (2011 RTP), under the RTP ID FRE500768, as identified in the 2011 RTP Amendment #2. The description of RTP ID FRE500768 in the RTP projects list is:

> In the City of Fresno, at 4 locations; reintroduce 2-lane undivided complete streets.
>
> 1) Fulton Mall between Tuolumne and Inyo Streets
> 2) Merced Mall from Congo Alley to Federal Alley
> 3) Mariposa Mall from Broadway Street to Federal Alley
> 4) Kern Mall from Fulton Mall to Federal Alley

FHWA determined the 2011 RTP to conform to the SIP on December 14, 2010. This analysis found that the 2011 RTP and, therefore, the individual projects contained in the 2011 RTP, are conforming projects, and will have air quality impacts consistent with those identified in the state implementation plans for achieving the NAAQS. The FHWA's conformity determination letter is contained in Appendix A.

The 2011 RTP Amendment #2 was adopted by Fresno COG . and the 2011 RTP Amendment #2 conformity was approved by FHWA on December 14, 2012. The Project's design concept and scope have not changed significantly from what was analyzed in the 2011 RTP Amendment #2. Therefore, the Project is consistent with Amendment #2 of the 2011 RTP. The relevant page of Amendment #2 modeling list and the FHWA's conformity determination are provided in Appendix A.

Federal Transportation Improvement Program

The Project is also included as project FRE130069 in the 2013 Federal Transportation Improvement Program (2013 FTIP) prepared by Fresno COG. The description of FRE13069 in the FTIP projects list is:

In the City of Fresno, at 4 locations; reintroduce 2-lane undivided complete streets.

1) Fulton Mall between Tuolumne and Inyo Streets
2) Merced Mall from Congo Alley to Federal Alley
3) Mariposa Mall from Broadway Street to Federal Alley
4) Kern Mall from Fulton Mall to Federal Alley

The Project is also listed in the 2013 FTIP Amendment #1 as project FRE130069, with the following project description and narrative:

Project Description. Fulton Mall and Mariposa Mall Street Reconstruction

Narrative. New Project TCSPPP: ► Add funds in 12/13 in ENG for $1,000

The Project's open to the public year is consistent with (within the same regional emission analysis period as) the construction completion date identified in the FTIP and the RTP. The FTIP gives priority to eligible Transportation Control Measures (TCMs) identified in the SIP and provides sufficient funds to provide for their implementation.

FHWA determined the 2013 FSTIP, including the MPO 2013 FTIPs and related 2013 FTIP Amendments, to conform to the SIP on December 14, 2012. The FHWA's conformity determination letter is contained in Appendix A. As with the RTP, the FTIP may be amended with new projects or revisions to project descriptions, costs or schedule. The FTIP's amendments include Amendments 1 through 6. Amendments were adopted by Fresno COG on various dates between August 2012 and May 2013, with FHWA December 2012 approval includes approval of 2013 FTIP Amendment 1, which was adopted in August 2012. The Project is included in the 2013 FTIP projects, including Amendment 1. The relevant page from the 2013 FTIP projects list is provided in Appendix A.

Conclusion

Therefore, because the Project is contained in the 2011 RTP and 2013 FTIP, because both plans have been determined to be in conformity, and because the Project's design concept and scope have not changed significantly from what was analyzed in the plans, the Project is consistent with regional conformity. Additional regional conformity analysis is not required.

4.1.2 - Project-Level Conformity

PM_{10} and $PM_{2.5}$

As discussed in 40 CFR 93.102(b), *Geographically applicability*, the provisions of Subpart A (Conformity to State or Federal Implementation Plans of Transportation Plans, Programs, and Projects Developed, Funded or Approved Under Title 23 U.S.C. or the Federal transit Laws) apply in nonattainment and maintenance areas for transportation criteria pollutants for which the area is designated nonattainment or has a maintenance plan. As described in the Regulatory Setting, the

Project area is in attainment or unclassified for the federal PM_{10} standards. Therefore, PM_{10} hot-spot analysis is not required. However, a $PM_{2.5}$ hot-spot analysis is required. As stated by 40 CFR §93.123:

> (b) PM10 and PM2.5 hot-spot analyses.
>
> (1) The hot-spot demonstration required by §93.116 must be based on quantitative analysis methods for the following types of projects:
>
> (i) New highway projects that have a significant number of diesel vehicles, and expanded highway projects that have a significant increase in the number of diesel vehicles;
>
> (ii) Projects affecting intersections that are at Level-of-Service D, E, or F with a significant number of diesel vehicles, or those that will change to Level-of-Service D, E, or F because of increased traffic volumes from a significant number of diesel vehicles related to the project;
>
> (iii) New bus and rail terminals and transfer points that have a significant number of diesel vehicles congregating at a single location;
>
> (iv) Expanded bus and rail terminals and transfer points that significantly increase the single location; and
>
> (v) Projects in or affecting locations, areas, or categories of sites which are identified in the PM10 or PM2.5 applicable implementation plan or implementation plan submission, as appropriate, as sites of violation or possible violation.
>
> (2) Where quantitative analysis methods are not available, the demonstration required by §93.116 for projects described in paragraph (b)(1) of this section must be based on a qualitative consideration of local factors.
>
> (3) DOT, in consultation with EPA, may also choose to make a categorical hot-spot finding that §93.116 is met without further hot-spot analysis for any project described in paragraph (b)(1) of this section based on appropriate modeling. DOT, in consultation with EPA, may also consider the current air quality circumstances of a given PM2.5 or PM10 nonattainment or maintenance area in categorical hot-spot findings for applicable FHWA or FTA projects.
>
> (4) The requirements for quantitative analysis contained in this paragraph (b) will not take effect until EPA releases modeling guidance on this subject and announces in the Federal Register that these requirements are in effect.

Furthermore, the $PM_{2.5}$ hot-spot analysis requirement of 40 CFR 93.116(a) contains the statement:

> … This criterion is satisfied without a hot-spot analysis in PM_{10} and $PM_{2.5}$ nonattainment and maintenance areas for FHWA/FTA projects that are not identified in §93.123(b)(1).

The EPA and the FHWA issued joint guidance on how to perform qualitative hot-spot analyses in $PM_{2.5}$ and PM_{10} nonattainment and maintenance areas. This guidance provides information for State and local agencies to meet the $PM_{2.5}$ and PM_{10} hot-spot analysis requirements established in the March 10, 2006, final transportation conformity rule (71 FR 12468). The 2006 guidance supersedes FHWA's September 12, 2001, "Guidance for Qualitative Project-Level: Hot-spot Analysis in PM10 Nonattainment and Maintenance Areas" (Qualitative $PM_{2.5}$ and PM_{10} Guidance).

The Qualitative $PM_{2.5}$ and PM_{10} Guidance states that the guidance is to be used to complete qualitative $PM_{2.5}$ hot-spot analyses only for "projects of air quality concern" (POAQC) as defined in 40 CFR 93.123(b)(1). Specifically:

> For all $PM_{2.5}$ 5 areas, this guidance would be used to complete qualitative $PM_{2.5}$ hot-spot analyses only for "projects of air quality concern" as defined in the final rule by 40 CFR 93.123(b)(1). The final rule specifies that projects of air quality concern are certain highway and transit projects that involve significant levels of diesel traffic, or any other project that is identified by the $PM_{2.5}$ SIP as a localized air quality concern.
>
> A qualitative $PM_{2.5}$ hot-spot analysis is not required for projects that are not an air quality concern. For these types of projects, state and local project sponsors should briefly document in their project-level conformity determinations that Clean Air Act and 40 CFR 93.116 requirements were met without a hot-spot analysis, since such projects have been found to not be of air quality concern under 40 CFR 93.123(b)(1).

The project would be reintroducing a 2-lane surface streets in the City of Fresno; the project is not a new or expanded highway project. In addition, the project would not involve trip-generating land uses or otherwise involve a significant number of diesel vehicles. Therefore, the project would not affect intersections at a LOS D, E, or F with a significant number of diesel vehicles. The project does not include a new or expanded bus or rail terminal or transfer points. Finally, the project site is not in the 2012 $PM_{2.5}$ Plan as a site of violation or possible violation. Therefore, the project does not meet the criteria listed in §93.123(b)(1) which identifies "projects of air quality concern" that must prepare a hot-spot analysis.

An Interagency Consultation Memo was circulated by Caltrans on July 30, 2013, requesting concurrence that the project was not a POAQC. The FHWA provided concurrence that the project is not a POAQC on August 5, 2013. The Interagency Consultation Memo and FHWA's concurrence letter are provided in Appendix B. As such, a quantified PM2.5 hot-spot analysis is not required. As specified in 40 CFR 93.116(a) and the Qualitative $PM_{2.5}$ and PM_{10} Guidance, the requirement is satisfied without further qualitative hot-spot analysis. The project would not cause or contribute to any new localized $PM_{2.5}$ violations, increase the frequency or severity of any existing $PM_{2.5}$ violations, or delay timely attainment of the $PM_{2.5}$ NAAQS or any required interim emission reductions or other milestones in the $PM_{2.5}$ nonattainment area.

CO Hot-spot

A CO hot spot is a localized concentration of CO that is above the state or national 1-hour or 8-hour CO ambient air standards. Localized high levels of CO are associated with traffic congestion and idling or slow-moving vehicles.

The Air Basin is in maintenance of the federal CO standards, therefore a CO analysis is not required for the conformity analysis.

4.2 - Project-Level Air Quality Impacts

4.2.1 - CO Hot-spot

This analysis utilizes the Transportation Project-Level Carbon Monoxide Protocol (CO Protocol) to determine if the Project would significantly contribute to a localized exceedance of the state or national CO ambient air standards, starting with Section 3 (Determination of Project Requirements), of the CO Protocol. The Protocol is the standard method for project-level CO analysis by Caltrans. The steps of analysis listed below are available in Figure 1 (Requirements for New Projects) of the CO Protocol (UCD 1997). In addition, a copy of the CO Protocol's Figure 1, highlighted to illustrate the Project's analysis, is provided in Appendix C. As shown below, the project would not result in a CO hot-spot; therefore, project-generated impacts to CO, a Clean Air Act criteria pollutant, would be minimal.

Protocol Question 1: 3.1.1. Is this project exempt from **all** emissions analyses? (see Table 1)

Project Answer 1: No.

Protocol Question 2: 3.1.2. Is project exempt from regional emissions analyses? (see Table 2)

Project Answer 2: No.

Protocol Question 3: 3.1.3. Is project defined as regionally significant?

40 CFR 93.101 defines 'regionally significant' as:

> A transportation project (other than an exempt project) that is on a facility which serves regional transportation needs (such as access to and from the area outside of the region, major activity centers in the region, major planned developments such as new retail malls, sports complexes, etc., or transportation terminals as well as most terminals themselves) and would normally be included in the modeling of a metropolitan area's transportation network, including at a minimum all principal arterial highways and all fixed guideway transit facilities that offer an alternative to regional highway travel.

Project Answer 3: Yes. The project is not identified in the 2013 FTIP as a regionally significant project. The project would not involve access to and from an area outside the region, to major activity centers in the region, major planned development, or transportation terminals. The project alignment is not a principal arterial highway or fixed guideway transit facility.

The project as proposed would be classified as a "collector" roadway under the City of Fresno's current General Plan (2025 General Plan), as well as the draft Fresno General Plan Update. However, the project would reintroduce a 2-lane collector roadway in the Primary Center of the City.

Protocol Question 4: 3.1.4. Is project in a federal attainment area? (classified as attainment of all transportation-related criteria pollutants, which are ozone, CO, NO_2, PM_{10} and $PM_{2.5}$)

Project Answer 4: No. The Project area is designated nonattainment of the federal 8-hour ozone standard and the federal $PM_{2.5}$ standard. The Project area is designated attainment for all other transportation-related criteria pollutants.

Protocol Instruction: Continue on to next page Box 3.1.5.

Protocol Question 5: 3.1.5. Is there a currently conforming RTP and TIP?

Project Answer 5: Yes. FHWA determined the 2013 Federal Statewide Transportation Improvement Program (2013 FSTIP), including the 2013 FTIPs and related FTIP amendments, to conform to the SIP on December 14, 2012. The Project is included in the 2013 FTIP projects, Amendments 1. In addition, the Project was included in the conformity modeling list for Amendment #2 of the 2011 RTP, which as approved by FHWA on December 14, 2012. See Appendix A for conformity documentation.

Protocol Question 6: 3.1.6. Is the project included in the regional emissions analysis supporting the currently conforming RTP and TIP?

Project Answer 6: Yes. The Project is included in the 2011 RTP and 2013 FTIP as project FRE500768 and FRE130069, respectively. See Appendix A.

Protocol Question 7: 3.1.7. Has project design concept and/or scope changed significantly from that in the regional analysis?

Project Answer 7: No.

Protocol Instruction: 3.1.9. Examine local impacts. Proceed to Section 4.

The following questions are from Section 4 of the CO protocol. The steps of analysis listed below are available in Figure 3 (Local CO Analysis) of the CO Protocol. In addition, a copy of the CO Protocol's Figure 3, highlighted to illustrate the project's analysis, is provided in Appendix C.

Protocol Question 8: Is the project in a CO nonattainment area?

Project Answer 8: No.

Protocol Question 9: Was the area redesignated as "attainment" after the 1990 Clean Air Act? (see Section 4.1.2)

Project Answer 9: No.

Protocol Instruction: Proceed to Level 7.

Protocol Question 10: Does the project worsen air quality? (see Section 4.7.1)

Per Section 4.7.1 of the CO Protocol, there are three criteria to use to determine whether a project is likely to worsen air quality for the area substantially affected by the project. Those criteria are provided below:

Protocol Criterion 1: The project significantly increases the percentage of vehicles operating in cold start mode.

Protocol Criterion 2: The project significantly increases traffic volumes. Increases in traffic volumes in excess of 5 percent should be considered potentially significant. Increasing the traffic volume by less than 5 percent may still be potentially significant if there is also a reduction in average speeds.

Protocol Criterion 3: The project worsens traffic flow. For uninterrupted roadway segments, a reduction in average speeds (within a range of 3 to 50 mph) should be regarded as worsening traffic flow. For intersection segments, a reduction in average speed or an increase in average delay should be considered as worsening traffic flow.

Project Answer 10: Yes. According to the CO Protocol, only projects that are likely to worsen air quality necessitate further analysis. The Project answers to the Question 5 criteria are provided below:

Answer Criterion 1: The Project would not increase the percentage of vehicles operating in cold start mode. As shown in the Traffic Impact Analysis and in Table 3 of this document, the Project (identified in the Traffic Impact Analysis as Build Alternatives) would result in reassignment of

existing daily trips through the area above the no build scenario (identified as in the Traffic Impact Analysis No Build Alternative). Although the table appears to show a minor (0.1 percent in 2015 and 1.2 percent in 2035) increase in trips through the project area, there is not a trip increase from Build Scenarios but a reassignment of existing trips through the project area. Alternative 1 and Alternative 2 would not increase the number of trips on the project area roadways compared to Alternative 3.

Answer Criterion 2: The Project would not increase traffic volumes. As shown in the Traffic Impact Analysis and in Table 3 of this document, the Project (identified in the Traffic Impact Analysis as Build Alternatives) would not increase daily trips above the no build scenario (identified as in the Traffic Impact Analysis No Build Alternative). Although the table appears to show a minor (0.1 percent in 2015 and 1.2 percent in 2035) increase in trips through the project area, there is not a trip increase from Build Scenarios but a reassignment of existing trips through the project area. Alternative 1 and Alternative 2 would not increase the number of trips on the project area roadways compared to Alternative 3. Therefore, the Project would not result in a substantial increase the peak-hour trips above the No Build Scenario.

Answer Criterion 3: As identified in Table 5, the Build Alternatives would result in a minor 2-second increase in delay at the Fresno Street/Van Ness Avenue intersection in year 2015, which would result in a change of LOS from C to D. In addition, the Build Alternatives would reduce the LOS at the Tuolumne Street/Fulton Street intersection from B to C in year 2035 (see Table 6). The project would result in an improvement of intersection operation at multiple intersections, including: Tuolumne Street/Van Ness Avenue, Tulare Street/Fulton Street, Ventura Avenue/ H Street (PM Hour) in 2015; Fresno Street/ H Street (AM Hour) Tulare Street /Fulton Street, Inyo Street/ H Street (PM Hour) in 2035. However,

Because further analysis is warranted, a microscalae emissions analysis was prepared for the Build Alternatives. This analysis follows guidelines recommended by the CO Protocol (University of California, Davis 1997) and the SJVAPCD. According to the CO Protocol, intersections with Level of Service (LOS) E or F require detailed analysis. Using the CALINE4 model, potential CO hot spots were analyzed at the following intersections:

- Intersection 9 Fresno Street/Van Ness Avenue, Baseline Plus Project Conditions, PM Peak Hour

- Intersection 16 Ventura Avenue /H Street, Cumulative Plus Project Conditions, PM Peak Hour

There are several inputs to the CALINE4 model. One input is the traffic volumes, which is from the project-specific traffic report. The traffic volumes with the project were used for the buildout scenario as well as emission factors generated using the EMFAC2007 model for the year 2015 and 2035.

As shown in Table 12, the estimated 1-hour and 8-hour average CO concentrations at build-out in combination with background concentrations are below the state and federal standards. No CO hot spots are anticipated because of reassigned traffic emissions by the project in combination with other anticipated development in the area. Therefore, the mobile emissions of CO from the project are not anticipated to contribute substantially to an existing or projected air quality violation of CO.

Table 12: Localized Carbon Monoxide Concentrations

Intersection	Peak Hour	Estimated CO Concentration (ppm)		Significant Impact?
		1 Hour	8 Hour	
9) Fresno Street/Van Ness Avenue, Baseline Plus Project Conditions	PM	3.0	2.1	No
16) Ventura Avenue /H Street, Cumulative Plus Project Conditions	PM	2.8	1.9	No

Notes:
The 1-hour concentration is the CALINE4 output (see Appendix D for model output) plus the 1-hour background concentration of 2.47 ppm (Calculated by dividing the 8-hour measurement from Table 11 by the persistence factor of 0.7).
The 8 hour project increment was calculated by multiplying the 1 hour CALINE4 output by 0.7 (persistence factor), then adding the 8 hour background concentration of 1.73 ppm (from Table 11).
A significant impact would occur if the estimated CO concentration is over the 1-hour state standard of 20 ppm or the 8-hour state/federal standard of 9 ppm.

4.2.2 - Construction-Generated Criteria Pollutants

Thresholds

The San Joaquin Valley Air Pollution Control (SJVAPCD) provides recommended significance thresholds in their Guide for Assessing and Mitigating Air Quality Impacts (GAMAQI). The SJVAPCD's thresholds are provided in Table 13. The SJVAPCD's thresholds are utilized for the majority of CEQA impact analysis, as requested by the CEQA Lead Agency.

Table 13: Significant Emissions Thresholds

Pollutant	Annual Threshold (tons)
Oxides of nitrogen (NO_x)	10
Reactive organic gases (ROG)	10
Particulate matter (PM_{10})	15
Particulate matter ($PM_{2.5}$)	15
Note: Source: SJVAPCD 2002	

Construction Emissions

Construction emissions can vary substantially from day to day, depending on the level of activity, the specific type of activity, and the prevailing weather conditions. The methodology developed for the purposes of this quantitative air quality analysis was based on information available at the time of analysis; actual equipment and activity intensity at the time of construction may vary from those analyzed in this document. However, it is anticipated that the level of activity analyzed is representative of activities that will occur during construction. The main sources of air pollutants associated with the Project include off-road construction equipment exhaust, worker trips, and fugitive PM_{10} and $PM_{2.5}$ emissions. The annual emissions for project demolition activity were estimated using CalEEMod. The annual emissions for project construction were estimated using the Roadway Construction Emissions Model, version 7, developed by Sacramento Metropolitan Air Quality Management District. The assumed construction phase durations are shown in Table 14 and Table 15.

Table 14: Construction Duration - Fulton Mall

Phase	Duration		
	Weeks	Working Days	Months
Demolition	3 weeks	15 days	0.75 months
Soil Excavation and Export	6 weeks	30 days	1.5 months
Storm Drain Replacement	12 weeks	60 days	3 months
Curb and Gutter	6 weeks	30 days	1.5 months
Asphalt and Rock	6 weeks	30 days	1.5 months
Sidewalk	12 weeks	60 days	3 months

Table 15: Construction Duration - Cross Malls

Phase	Duration		
	Weeks	Working Days	Months
Demolition	2 weeks	10 days	0.5 months
Soil Excavation and Export	3.75 weeks	19 days	0.94 months
Storm Drain Replacement	6 weeks	30 days	1.5 months
Curb and Gutter	3 weeks	15 days	0.75 months
Asphalt and Rock	3 weeks	15 days	0.75 months
Sidewalk	5 weeks	25 days	1.25 months

Based on the roadway widths and lengths to be improved, as discussed in the Project description, and the Project layout, the emissions analysis assumed the following construction activity:

Fulton Street

- Approximately 2,747 feet of length (0.52 mile) would be paved,
- Approximately 5.0 acres would be disturbed during the course of the Fulton Street construction,
- A maximum of 0.1 acre would be disturbed on any one day,
- Project construction would begin in 2014,
- Demolition would result in 6,867 tons of material removed; 18 tons per truck, 382 one-way trips for materials hauling; average 8-miles per one-way trip for a total of 6,112 truck trip miles
- Soils Excavation
  - Option 1 soils excavation would result in 4,477 cubic yards (cyd) of materials; 16 cyd per truck at 8 miles per one-way trip for a total of 4,480 soils hauling truck miles.
  - Option 2 soils excavation would result in 4,070 cyd of materials; 16 cyd per truck at 8 miles per one-way trip for a total of 4,070 soils hauling truck miles.
- Storm Drain replacement would result in 2,440 cyd of onsite materials movement with no export or import,
- Curb and Gutter would result in 286 cyd of soils removal, at 8 cyd per truck and 8 miles per one-way trip for a total of 288 on-road hauling miles,
- Asphalt and Rock

  Rock
  - Option 1 asphalt and rock would result in emplacement of 3,000 cyd (5,264 tons) of rock; 20 tons per truck at 8 miles per one-way trip for 4,208 miles of rock hauling trips.
  - Option 2 asphalt and rock would result in emplacement of 2,727 cyd (4,785 tons) of rock; 20 tons per truck at 8 miles per one-way trip for 3,840 miles of rock hauling trips.

Asphalt

- Option 1 asphalt and rock would result in emplacement of 1,522 cyd (2,979 tons) of asphalt; 22 tons per truck at 8 miles per one-way trip for 2,160 miles of asphalt hauling trips.
- Option 2 asphalt and rock would result in emplacement of 1,384 cyd (2,708 tons) of asphalt; 22 tons per truck at 8 miles per one-way trip for 1,968 miles of asphalt hauling trips.

- Sidewalks
  - Option 1 sidewalks would result in 1,394 cyd of concrete emplacement; 8 cyd per truck at 8 miles per one-way trip for a total of 2,784 concrete hauling truck miles.
  - Option 2 sidewalks would result in 1,549 cyd of concrete emplacement; 8 cyd per truck at 8 miles per one-way trip for a total of 3,104 concrete hauling truck miles.

Cross Malls

- Approximately 1,410 feet of length (0.27 mile) would be paved,
- Approximately 2.6 acres would be disturbed during the course of the Cross Malls street construction,
- A maximum of 0.1 acre would be disturbed on any one day,
- Project construction would begin in 2014,
- Demolition
  - Mariposa Mall demolition would result in 25,335 cubic yards (1,900 tons) of materials removed; 18 tons per truck at 8 miles per one-way trip for a total of 1,696 materials hauling truck miles.
  - Kern and Merced Malls demolition would result in 47,004cubic yards (3,525 tons) of materials removed; 18 tons per truck at 8 miles per one-way trip for a total of 3,136 materials hauling truck miles.
- Soils Excavation
  - Mariposa Mall soils excavation would result in 1,239 cubic yards (cyd) of materials; 16 cyd per truck at 8 miles per one-way trip for a total of 1,232 soils hauling truck miles.
  - Kern and Merced Streets soils excavation would result in 991 cubic yards (cyd) of materials; 16 cyd per truck at 8 miles per one-way trip for a total of 992 soils hauling truck miles.
- Storm Drain replacement would result in 1,253 cyd of onsite materials movement with no export or import,
- Curb and Gutter would result in 141 cyd of soils removal, at 8 cyd per truck and 8 miles per one-way trip for a total of 144 on-road hauling miles,

- Asphalt and Rock

  Rock

  - Mariposa Mall asphalt and rock would result in emplacement of 830 cyd (1,456 tons) of rock; 20 tons per truck at 8 miles per one-way trip for 1,168 miles of rock hauling trips.
  - Kern and Merced Streets asphalt and rock would result in emplacement of 664 cyd (1,166) of rock; 20 tons per truck at 8 miles per one-way trip for 944 miles of rock hauling trips.

  Asphalt

  - Mariposa Mall asphalt and rock would result in emplacement of 421 cyd (824 tons) of asphalt; 22 tons per truck at 8 miles per one-way trip for 592 miles of asphalt hauling trips.
  - Kern and Merced Streets asphalt and rock would result in emplacement of 337 cyd (660 tons) of asphalt; 22 tons per truck at 8 miles per one-way trip for 480 miles of asphalt hauling trips.
- Sidewalks would result in 918 cyd of concrete emplacement; 8 cyd per truck at 8 miles per one-way trip for a total of 1,840 concrete hauling truck miles.

Demolition activity was estimated using CalEEMod. For the purposes of modeling the on-road hauling emission for soils export, rock import, asphalt import, and concrete export, for the non-demolition phases in the Roadway Construction Emissions Model, a summary of hauling miles was prepared. Summaries of hauling miles for Fulton Mall Alternative 1, Fulton Mall Alternative 2, and the Cross Malls construction are provided in Table 16, Table 17, and Table 18, respectively. The CalEEMod and Roadway Construction Emissions Model output is provided in Appendix E.

Table 16: Hauling Miles- Fulton Mall Alternative 1

Phase	Hauling Parameter		
	Round Trip Length (Miles)	Total Round Trips	Total Miles
Soil Excavation and Export	16	280	4,480
Curb and Gutter	16	18	288
Rock	16	263	4,208
Asphalt	16	135	2,160
Sidewalk	16	174	2,784
Total	-	870	13,920

Table 17: Hauling Miles- Fulton Mall Alternative 2

Phase	Hauling Parameter		
	Round Trip Length (Miles)	Total Round Trips	Total Miles
Soil Excavation and Export	16	254	4,070
Curb and Gutter	16	18	288
Rock	16	240	3,840
Asphalt	16	123	1,968
Sidewalk	16	196	3,140
Total	-	832	13,306

Table 18: Hauling Miles - Cross Malls

Phase	Hauling Parameter		
	Round Trip Length (Miles)	Total Round Trips	Total Miles
Soil Excavation and Export - Mariposa	16	77	1,232
Soil Excavation and Export - Kern and Merced	16	62	992
Curb and Gutter	16	9	144
Rock - Mariposa	16	73	1,168
Rock - Kern and Merced	16	59	944
Asphalt - Mariposa	16	37	592
Asphalt - Kern and Merced	16	30	480
Sidewalks	16	155	1,840
Total	-	462	7,392

Results

The Project's construction emissions (equipment exhaust and dust generation) during construction are compared with the SJVAPCD's significance thresholds and are summarized in Table 19. As shown in Table 19, unmitigated emissions during construction do not exceed the daily or annual significance thresholds. However, the following mitigation is added to minimize the project's potential impacts from fugitive dust and equipment exhaust emissions:

Table 19: Annual Construction Emissions (Alternative 1)

Activity	Emissions (tons per day)			
	ROG	NO_X	PM_{10}	$PM_{2.5}$
Fulton Mall Demolition	0.07	0.57	0.15	0.04
Fulton Mall Soils Excavation, Storm Drain Replacement Curb and Gutter, Rock and Asphalt, Sidewalks	0.60	5.30	0.40	0.30
Subtotal Fulton Mall	*0.67*	*5.87*	*0.55*	*0.34*
Cross Malls Demolition	0.05	0.39	0.10	0.03
Cross Malls Soils Excavation, Storm Drain Replacement Curb and Gutter, Rock and Asphalt, Sidewalks	0.30	2.70	0.20	0.10
Subtotal Cross Mall	*0.35*	*3.09*	*0.30*	*0.13*
Total Project Construction	1.02	8.96	0.85	0.47
SJVAPCD Threshold	10	10	10	15
Exceed Threshold?	No	No	No	No
Source: MBA 2013, Appendix E				

Table 20: Annual Construction Emissions (Alternative 2)

Activity	Emissions (tons per day)			
	ROG	NO_X	PM_{10}	$PM_{2.5}$
Fulton Mall Demolition	0.07	0.57	0.15	0.04
Fulton Mall Soils Excavation, Storm Drain Replacement Curb and Gutter, Rock and Asphalt, Sidewalks	0.60	5.30	0.40	0.30
Subtotal Fulton Mall	*0.67*	*5.87*	*0.55*	*0.34*
Cross Malls Demolition	0.05	0.39	0.10	0.03
Cross Malls Soils Excavation, Storm Drain Replacement Curb and Gutter, Rock and Asphalt, Sidewalks	0.30	2.70	0.20	0.10
Subtotal Cross Mall	*0.35*	*3.09*	*0.30*	*0.13*
Total Project Construction	1.02	8.96	0.85	0.47
SJVAPCD Threshold	10	10	10	15
Exceed Threshold?	No	No	No	No
Source: MBA 2013, Appendix E				

The Project would not exceed the SJVAPCD's thresholds for ROG, NO_X, PM_{10} or $PM_{2.5}$ during construction. In addition, the Project's construction activities are estimated to last approximately 14 months. Therefore, the project would result in minimal air quality impacts for Clean Air Act criteria pollutants.

Construction Emissions Mitigation

Fugitive Dust

MM AIR-1 During construction, in addition to San Joaquin Valley Air Pollution Control District Regulation VIII requirements for dust control, the project shall also implement the following additional dust control measures:

- Limit traffic speeds on unpaved roads to 15 mph;
- Limit area subject to excavation, grading, and other construction activity at any one time. (Construction area limited to 10 acres per day);
- Install sandbags or other erosion control measures to prevent silt runoff to public roadways from sites with a slope greater than one percent.
- Install wheel washers for all exciting trucks, or wash off all trucks and equipment leaving the site;

- Install wind breaks at windward sides(s) of construction areas; and
- Suspend excavation and grading activity when winds exceed 20 mph. Regardless of wind speed, an owner/operator must comply with Regulation VIII's 20 percent opacity limitation.
- Post a publicly visible sign with the telephone number and person to contact at the lead agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The San Joaquin Valley Air Pollution Control District's phone number shall also be visible to ensure compliance with applicable regulations.

Construction Equipment Exhaust

MM AIR-2 During construction, the project shall also implement the following additional construction equipment exhaust control measures:

- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.
- All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified visible emissions evaluator.
- The project shall develop a plan demonstrating that the off-road equipment (more than 50 horsepower) to be used in the construction project (i.e., owned, leased, and subcontractor vehicles) would achieve a project wide fleet-average 20 percent NO_X reduction and 45 percent PM_{10} reduction compared to the most recent ARB fleet average. Acceptable options for reducing emissions include the use of late model engines, low-emission diesel products, alternative fuels, engine retrofit technology, after-treatment products, add-on devices such as particulate filters, and/or other options as such become available.

4.2.3 - Operational Particulate Matter Hot-spot

The SJVAPCD does not have a qualitative or quantitative threshold or methodology of analysis for operational PM_{10} or $PM_{2.5}$ hot-spot analysis. Furthermore, the project is exempted from PM hot-spot analysis under the conformity analysis, as shown in Section 4.1.2.

The purpose of the proposed project is to improve parking and vehicle access to local businesses on Fulton Street in order to maximize sustainable development and economic productivity in conjunction with other downtown redevelopment projects. The proposed project would also be intended to lower

crime and improve safety for people walking between parking areas and businesses located on the Fulton Mall and for people who live in, work in, and visit the project area.

The project does not propose any additional traffic generating land uses. The alternatives are not expected to affect traffic volumes. Since the Build Alternatives propose narrow, two-way vehicular streets, it is anticipated that the reintroduced roadways associated with these alternatives would serve existing traffic by providing access to existing businesses along the pedestrian malls, but would not induce additional travel upon opening (Fehr and Peers, 2013). As shown in Table 1, Table 2, and Table 3, the Build Alternatives would appear to result in slightly more Average Daily Trips than the No Build scenario. Per the Transportation Impact Report:

> … it is anticipated that the reintroduced roadways associated with these alternatives would serve existing traffic by providing access to existing businesses along the pedestrian malls, but would not induce additional travel upon opening.

And

> The Open to Traffic alternatives may cause some shifts in local traffic patterns by opening the existing Fulton Mall and its cross streets to vehicle traffic. However, since these alternatives would create narrow, two-way vehicular streets, these new roadways would primarily carry local trips to access adjacent businesses. Therefore, these changes in traffic patters would be localized to roadways in the project study area.

The apparent increase is not a trip increase from Build Scenarios, but is a result of reassignment of existing trips through the project area. Alternative 1 and Alternative 2 would not increase the number of trips on the project area roadways compared to Alternative 3.

This project is estimated to generate minimal air quality impacts for the Clean Air Act criteria pollutants, as detailed in Sections 4.2.1 and 4.2.2, and has not been linked with any special PM_{10} or $PM_{2.5}$ concerns. Re-entrained road dust was estimated for the project using CalEEMod emissions model for Fresno County for years 2010, 2015 and 2035. The emissions output are provided in Appendix F. The analysis contains the following analysis scenarios:

- 2010 Conditions, with 210 AADT, 165.27 daily VMT, and 60,323.55 annual VMT
- 2015 Conditions, with 210 AADT, 165.27 daily VMT, and 60,323.55 annual VMT
- 2035 Conditions, with 2,310 AADT, 1,817.97 daily VMT, and 663,559.05 annual VMT

Each scenario listed above is relevant to the Alternative 1, Alternative 2 and Alternative 3 scenario occurring within that year, as further illustrated in Table 21.

Table 21: Annual Vehicle Miles Traveled by Alternative

Year	Alternative 1 (Build Alternative)	Alternative 2 (Build Alternative)	Alternative 3 (No Project/No Build Alternative)
2010	60,323.55	60,323.55	60,323.55
2015	60,323.55	60,323.55	60,323.55
2035	663,559.05	663,559.05	663,559.05
Source: Fehr and Peers, 2013.			

The annual VMT from Table 21 were used to calculate the operational re-entrained road dust by alternative. The operational PM10 from re-entrained road dust is for each alternative is provided in Table 22.

Table 22: Operational Re-entrained Road Dust by Alternative

Year	Annual Tons PM10		
	Alternative 1 (Build Alternative)	Alternative 2 (Build Alternative)	Alternative 3 (No Project/No Build Alternative)
2010	0.00	0.00	0.00
2015	0.00	0.00	0.00
2035	0.00	0.00	0.00
Notes: Source: MBA 2013.			

As such, this Project will not result in any meaningful changes in traffic volumes, vehicle mix, location of the existing facility, or any other factor that would cause an increase in PM_{10} or $PM_{2.5}$ impacts of the project from that of the no-build alternative.

4.2.4 - Toxic Air Contaminant Analysis

The three toxic air contaminants/hazardous air pollutant categories applicable to the Project are MSAT, NOA, and DPM. Each subject is addressed below:

Mobile Source Air Toxics

The 2009 Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA documents (2009 Interim MSAT Guidance), published by the FHWA, was utilized to determine the project's potential for MSAT impacts. The FHWA has developed a tiered approach for analyzing MSAT, which are based on three levels of analysis:

1. No analysis for projects with no potential for meaningful MSAT effects;

2. Qualitative analysis for projects with low potential MSAT effects; or

3. Quantitative analysis to differentiate alternatives for projects with higher potential for MSAT effects.

Under the first level, Projects with no potential for meaningful MSAT effects, the types of projects included are:

- Projects qualifying as a categorical exclusion under 23 CFR 771.117(c)
- Projects except under the Clean Air Act conformity rule under 40 CFR 93.126; or
- Other projects with no meaningful impacts on traffic volumes or vehicle mix.

Analysis shows that this project would have no meaningful impacts on traffic volumes or vehicle mix for the project area, as detailed below. However, the project would reassign existing trips in the project area. The project does not propose any additional traffic generating land uses. Since the Build Alternatives propose narrow, two-way vehicular streets, it is anticipated that the reintroduced roadways associated with these alternatives would serve existing traffic by providing access to existing businesses along the pedestrian malls, but would not induce additional travel upon opening (Fehr and Peers, 2013). As shown in Table 1, Table 2, and Table 3, the Build Alternatives would appear to result in slightly more Average Daily Trips than the No Build scenario. Per the Transportation Impact Report:

> … it is anticipated that the reintroduced roadways associated with these alternatives would serve existing traffic by providing access to existing businesses along the pedestrian malls, but would not induce additional travel upon opening.

And

> The Open to Traffic alternatives may cause some shifts in local traffic patterns by opening the existing Fulton Mall and its cross streets to vehicle traffic. However, since these alternatives would create narrow, two-way vehicular streets, these new roadways would primarily carry local trips to access adjacent businesses. Therefore, these changes in traffic patters would be localized to roadways in the project study area.

The apparent increase is not a trip increase from Build Scenarios, but is a result of reassignment of existing trips through the project area. All trips would be existing in the project area under the Build and No Build Alternatives. Under the Build Alternatives, existing trips within the project area would be rerouted from existing travel paths through the project segments. Therefore, the apparent increase

on roadway segments identified in Table 1, Table 2, and Table 3 result from a decrease of trips on other project area roadways due to the reassignment of existing trips.

The Build Alternatives would not increase the number of trips on the project area roadways compared to No Build Alternative. However, the Build Alternatives would reassign existing trips to a new location, the Fulton Mall. As shown in Table 1 and Table 2, the build alternatives would result in 210 AADT and 2,310 AADT on the Fulton segment under the 2015 and 2035 scenarios, respectively. Under the No Build Alternative, the Fulton Mall would remain a pedestrian mall, and existing trips would remain in the project area. The relocation of existing trips may have a low potential for MSAT emissions.

A qualitative analysis provides a basis for identifying and comparing the potential differences among MSAT emissions, if any, from the various alternatives. The qualitative assessment presented below is derived in part from a study conducted by the FHWA entitled *A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives*, found at: www.fhwa.dot.go/environment/air_quality/air_toxics/research_and_analysis/methodology/methodology00.cfm.

The 2009 Interim MSAT Guidance provides examples of qualitative MSAT analyses for different types of projects. Each project is different, and some projects may contain elements covered in more than one of the examples below. Analysts can use the example language as a starting point, but should tailor it to reflect the unique circumstances of the project being considered. The types of example projects include minor widening projects; new interchanges, replacing a signalized intersection on a surface street; or projects where design year traffic is projected to be less than 140,000 to 150,000 annual average daily traffic (AADT). The Build Alternatives are estimated to facilitate 210 existing AADT in 2015, and 2,310 AADT in 2035 conditions.

For each alternative in this report the amount of MSAT emitted would be proportional to the vehicle miles traveled, or VMT, assuming that other variables such as fleet mix are the same for each alternative. The VMT estimated for each of the Build Alternatives is the same as for the No Build Alternative, however, the Build Alternatives increases the efficiency of the roadway and attracts rerouted trips from elsewhere in the transportation network. Refer to Table 21. This relocation of VMT would lead to higher MSAT emissions for the Build Alternatives along the project alignment, along with a corresponding decrease in MSAT emissions along the parallel routes. The emissions increase is offset somewhat by lower MSAT emission rates due to increased speeds; according to EPA's MOVES2010b model, emissions of all of the priority MSAT decrease as speed increases. Because the estimated VMT under each of the Alternatives are the same, it is expected there would be no appreciable difference in overall MSAT emissions among the various alternatives. Also, regardless of the alternative chosen, emissions will likely be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce annual MSAT emissions by over 80 percent between 2010 and 2050. Local conditions may differ from these national projections

in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in nearly all cases.

The reintroduced travel lanes contemplated as part of the project alternatives will have the effect of moving some traffic closer to nearby residences; therefore, under each alternative there may be localized areas where ambient concentrations of MSAT could be higher under certain Build Alternatives than the No Build Alternative. The localized increases in MSAT concentrations would likely be most pronounced along the expanded roadway sections that would be built at Fulton Mall, under the Build Alternatives. However, the magnitude and the duration of these potential increases compared to the No-Build alternative cannot be reliably quantified due to incomplete or unavailable information in forecasting project-specific MSAT health impacts. In sum, when a roadway is reintroduced, the localized level of MSAT emissions for the Build Alternative could be higher relative to the No Build Alternative, but this could be offset due to increases in speeds and reductions in congestion in the project area (which are associated with lower MSAT emissions). Also, MSAT will be lower in other locations when traffic shifts away from them. However, on a regional basis, EPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause region-wide MSAT levels to be significantly lower than today.

Furthermore, analysis shows this project would generate minimal air quality impacts for the Clean Air Act criteria pollutants, as detailed in Sections 4.2.1 and 4.2.2, and has not been linked with any special MSAT concerns.

Moreover, EPA regulations for the vehicle engines and fuels will cause overall MSAT emissions to decline significantly over the next several decades. Based on regulations now in effect, an analysis of national trends with EPA's MOBILE6.2 model forecasts a combined reduction of 72 percent in the total annual emission rate for the priority MSAT from 1999 to 2050 while vehicle miles of travel are projected to increase by 145 percent. This will both reduce the background levels of MSAT as well as the possibility of even minor MSAT emissions from this project.

Naturally Occurring Asbestos

During construction in areas that contain NOA-containing rock formations, asbestos can be released into the air and pose a health hazard. The Department of Conservation, Division of Mines and Geology (DMG) has a published guide for generally identifying areas that are likely to contain NOA (DMG 2000). A review of DMG's map showing areas more likely to have rock formations containing NOA indicates that the Project site is not in an area that is likely to contain NOA. In addition, the DMG map indicates that there are no areas within City of Fresno are likely to contain NOA. Therefore, disturbance of NOA is not a concern for the Project.

Diesel Particulate Matter

Construction activities would also involve the use of diesel-powered construction equipment, which emit DPM. Risk assessments for residential areas exposed to TACs are generally based on a 70-year period of exposure. Construction emissions would occur in 2014 and 2015, and construction is anticipated to be completed within 12 months. Since the use of construction equipment would be temporary and would not be close to the 70-year timeframe, exposure of sensitive receptors to TACs would not be substantial. Emissions of DPM would not be substantial enough to be considered a health risk.

4.2.5 - Air Quality Attainment Plan Conformity

The SJVAPCD specifies that a project is conforming to the applicable attainment or maintenance plan if it:

1. Complies with all applicable SJVAPCD rules and regulations,
2. Complies with all applicable control measures from the applicable plans, and
3. Is consistent with the growth forecast in the applicable plans.

Compliance with adopted SJVAPCD rules and regulations is a requirement under the law. The Project will implement and comply with all applicable SJVAPCD rules and regulations. In addition, the project must comply with all applicable control measures from the applicable SJVAPCD attainment plans. Therefore, the Project complies with the second criterion.

Finally, the Project is consistent with the growth forecast in the Plan. The Fulton Mall has been designated as a collector street by the City of Fresno, which has planned the roadway to be built to two-lanes. In addition, the project does not propose any additional traffic generating land uses. The alternatives are not expected to affect traffic volumes. Since the Build Alternatives propose narrow, two-way vehicular streets, it is anticipated that the reintroduced roadways associated with these alternatives would serve existing traffic by providing access to existing businesses along the pedestrian malls, but would not induce additional travel upon opening (Fehr and Peers, 2013).

The proposed improvements (i.e., Alternatives 1 and 2) would implement that plan, and accommodate projected buildout traffic conditions. Without implementation of the build alternatives (i.e., Alternative 3 - No Project/No Action), the buildout traffic conditions would result in congestion and a reduced LOS on the project area roadways.

4.2.6 - Greenhouse Gases and Climate Change

Greenhouse gas emissions would occur during project construction, and operation. The following greenhouse gas significance thresholds are contained in Appendix G of the CEQA Guidelines. A significant impact would occur if the Project would:

a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment; or

b) Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases.

An individual project does not generate enough greenhouse gas emissions to significantly influence global climate change. Rather, global climate change is a cumulative impact. This means that a project may participate in a potential impact through its incremental contribution combined with the contributions of all other sources of greenhouse gases. In assessing cumulative impacts, it must be determined if a project's incremental effect is "cumulatively considerable." See CEQA Guidelines sections 15064(h)(1) and 15130. To make this determination the incremental impacts of the project must be compared with the effects of past, current, and probable future projects. To gather sufficient information on a global scale of all past, current, and future projects in order to make this determination is a difficult if not impossible task.

The AB 32 Scoping Plan contains the main strategies California will use to reduce greenhouse gases. As part of its supporting documentation for the Draft Scoping Plan, ARB released the greenhouse gas inventory for California (Forecast last updated: 28 October 2010). The forecast is an estimate of the emissions expected to occur in the year 2020 if none of the foreseeable measures included in the Scoping Plan were implemented. The base year used for forecasting emissions is the average of statewide emissions in the greenhouse gas inventory for 2006, 2007, and 2008.

Caltrans and its parent agency, the Business, Transportation, and Housing Agency, have taken an active role in addressing greenhouse gas emission reduction and climate change. Recognizing that 98 percent of California's greenhouse gas emissions are from the burning of fossil fuels and 40 percent of all human made greenhouse gas emissions are from transportation, Caltrans has created and is implementing the Climate Action Program at Caltrans that was published in December 2006 (see Climate Action Program at Caltrans (December 2006).

Generate Greenhouse Gas Emissions

Greenhouse gas emissions for transportation projects can be divided into those produced during construction and those produced during operations. Construction greenhouse gas emissions include emissions produced as a result of material processing, emissions produced by onsite construction equipment, and emissions arising from traffic delays due to construction. These emissions will be produced at different levels throughout the construction phase; their frequency and occurrence can be reduced through innovations in plans and specifications and by implementing better traffic management during construction phases.

Construction

The Project would emit greenhouse gases from upstream emission sources and direct sources (combustion of fuels from worker vehicles and construction equipment). An upstream emission source (also known as life cycle emissions) refers to emissions that were generated during the manufacture of products to be used for construction of the Project. Upstream emission sources for the Project include but are not limited to the following: emissions from the manufacture of steel and/or emissions from the transportation of construction materials in other countries. The upstream emissions were not estimated because they are not within the control of the Project and to do so would be speculative at this time. Additionally, the California Air Pollution Control Officers Association (CAPCOA) White Paper on CEQA & Climate Change supports this conclusion by stating, "The full life-cycle of GHG [greenhouse gas] emissions from construction activities is not accounted for … and the information needed to characterize [life-cycle emissions] would be speculative at the CEQA analysis level" (CAPCOA 2008). Therefore, pursuant to CEQA Guidelines Section 15144 and 15145, upstream/life cycle, emissions are speculative and no further discussion is necessary.

The emissions of CO_2 from Project construction equipment and worker vehicles were calculated using the Road Construction Emissions Model, Version 7, and the CalEEMod emissions model. The Project would result in approximately 910.62 metric tons of CO_2 ($MTCO_2e$) in 2014 for Alternative 1, and 909.53 $MTCO_2e$ in 2014 for Alternative 2. The Project would also emit methane and nitrous oxide from construction equipment; however, emissions of methane and nitrous oxide are negligible compared to CO_2 emissions.

Table 23: Greenhouse Gas from Construction

Construction Phase	Alternative 1		Alternative 2	
	Metric Tons CO_2e	English Tons	Metric Tons CO_2e	English Tons
Fulton Mall Demolition	51.20	-	51.20	-
Fulton Mall Soils Excavation, Storm Drain Replacement Curb and Gutter, Rock and Asphalt, Sidewalks	549.13	605.3	548.04	604.1
Subtotal Fulton Mall	600.33	-	599.24	-
Cross Malls Demolition	34.14	-	34.14	-
Cross Malls Soils Excavation, Storm Drain Replacement Curb and Gutter, Rock and Asphalt, Sidewalks	276.15	304.4	276.15	304.4
Subtotal Cross Mall	310.29	-	310.29	-
Total Construction Emissions	910.62	-	909.53	-
Source: MBA 2013, Appendix E				

Construction emissions would be short term in nature and would occur before the year 2020. AB 32 requires that annual emissions in the State of California be reduced to 1990 levels by the year 2020. Although some greenhouse gases can remain in the atmosphere for long periods, AB 32 does not regulate concentrations.

Operation

Greenhouse gas emissions were estimated using the web-based data access EMFAC2011, the AADT contained in for Roadway Segment 4 (Fresno Street; Tuolumne Street to Inyo Street) from Table 1 and Table 2, and a trip length of 0.787 mile. Because the AADT in Table 1 and Table 2 are for the volume for the Fulton Street roadway segment, and because the cross-malls do not connect with other collectors, and because the AADT for the cross malls are unknown, the analysis is conservative by applying the AADT to the entire Project length. Therefore, multiplying the AADT by the project trip length of 1.5 miles produces the daily vehicle miles traveled (VMT) for the Project segment.

The project does not propose any additional traffic generating land uses. The alternatives are not expected to affect traffic volumes. Since the Build Alternatives propose narrow, two-way vehicular streets, it is anticipated that the reintroduced roadways associated with these alternatives would serve existing traffic by providing access to existing businesses along the pedestrian malls, but would not induce additional travel upon opening (Fehr and Peers, 2013). As shown in Table 1 and Table 2, the

Build Alternatives would appear to result in slightly more Average Daily Trips than the No Build scenario. Per the Transportation Impact Report:

> … it is anticipated that the reintroduced roadways associated with these alternatives would serve existing traffic by providing access to existing businesses along the pedestrian malls, but would not induce additional travel upon opening.

And

> The Open to Traffic alternatives may cause some shifts in local traffic patterns by opening the existing Fulton Mall and its cross streets to vehicle traffic. However, since these alternatives would create narrow, two-way vehicular streets, these new roadways would primarily carry local trips to access adjacent businesses. Therefore, these changes in traffic patters would be localized to roadways in the project study area.

Therefore, the AADT of Roadway Segment 4 (Fresno Street; Tuolumne Street to Inyo Street) are not new trips, but a reassignment of existing trips from the project area. Alternative 1 and Alternative 2 would not increase the number of trips on the project area roadways compared to Alternative 3. Therefore, under Alternative 3 (No Build) the same number of AADT would be occurring in the project area, just not physically located on Fulton Mall.

The EMFAC2011 emission factors for Fresno County for years 2010, 2015 and 2035 are provided in Appendix G. The analysis contains the following analysis scenarios:

- 2010 Conditions, with 210 AADT, 165.27 daily VMT, and 60,323.55 annual VMT
- 2015 Conditions, with 210 AADT, 165.27 daily VMT, and 60,323.55 annual VMT
- 2035 Conditions, with 2,310 AADT, 1,817.97 daily VMT, and 663,559.05 annual VMT

Each scenario listed above is relevant to the Alternative 1, Alternative 2 and Alternative 3 scenario occurring within that year, as further illustrated in Table 24.

Table 24: Annual Vehicle Miles Traveled by Alternative

Year	Alternative 1 (Build Alternative)	Alternative 2 (Build Alternative)	Alternative 3 (No Project/No Build Alternative)
2010	60,323.55	60,323.55	60,323.55
2015	60,323.55	60,323.55	60,323.55
2035	663,559.05	663,559.05	663,559.05
Source: Fehr and Peers, 2013.			

The tons per mile emission factors for CO_2 from EMFAC2011 were used to calculate the $MTCO_2$ for two emissions scenarios. The first scenario is 'Without Regulation', and does not include the calculated emission reductions attributable to implementation of State regulation. The second scenario is with State regulation; specifically, Pavley I and the Low Carbon Fuel Standard. The emission factors in EMFAC2011 are provided by vehicle class. The emission factors by vehicle class and VMT distribution by vehicle type were used to determine a weighted average emission factor. The weighted average emission factors for years 2010, 2015, and 2035 for the two scenarios are provided in Table 25.

Table 25: CO_2 Emission Factors for Fresno County

Year	Average Tons Per Mile	
	Without Regulation	With Regulation (Pavley I and LCFS)
2010	0.000609986	0.000608045
2015	0.000625816	0.000569272
2035	0.000637624	0.000472034

Notes:
LCFS = Low Carbon Fuel Standard
Source: MBA 2013.

The emission factors from Table 25 and the annual VMT from Table 24 were used to calculate the operational $MTCO_2e$ by alternative. The Without Regulation scenario operational $MTCO_2e$ for each alternative is provided in Table 26. . The With Regulation scenario operational $MTCO_2e$ for each alternative is provided in Table 27.

Table 26: Operational CO_2 by Alternative - Without Regulation

Year	Annual Tons CO_2 ($MTCO_2$)		
	Alternative 1 (Build Alternative)	Alternative 2 (Build Alternative)	Alternative 3 (No Project/No Build Alternative)
2010	36.80	36.80	36.80
2015	37.75	37.75	37.75
2035	423.10	423.10	423.10

Notes:
Source: MBA 2013.

Table 27: Operational CO_2 by Alternative - With Regulation

Year	Annual Tons CO_2 ($MTCO_2$)		
	Alternative 1 (Build Alternative)	Alternative 2 (Build Alternative)	Alternative 3 (No Project/No Build Alternative)
2010	36.68	36.68	36.68
2015	34.34	34.34	34.34
2035	313.22	313.22	313.22

Notes:
Source: MBA 2013.

Although emissions estimates are the same for all alternatives, the Project is expected to improve the LOS intersections along the Project area. The Project would create additional travel pathways through the project area, and provide more direct routes through the project area, thereby improving mobility and potentially reducing regional VMT. Improvement in traffic flow would reduce criteria pollutants and greenhouse gas emissions because emissions on a grams-per-mile basis decrease while the speed increases, with a peak efficiency at about 45 to 50 miles per hour. Therefore, emissions of greenhouse gases would be lower with the build alternatives (Alternatives 1 and 2) and higher with the No Project/No Action alternative (Alternative 3).

One of the main strategies in Caltrans's Climate Action Program to reduce greenhouse gas emissions is to make California's transportation system more efficient. The highest levels of carbon dioxide from mobile sources, such as automobiles, occur at stop-and-go speeds (0-25 miles per hour) and speeds over 55 mph; the most severe emissions occur from 0-25 miles per hour. To the extent that a project relieves congestion by enhancing operations and improving travel times in high congestion travel corridors greenhouse gas emissions, particularly CO_2, may be reduced.

Plan Consistency

Caltrans's overall approach to lowering fuel consumption and carbon dioxide from transportation is twofold: (1) reducing congestion and improving efficiency of transportation systems through smart land use, operational improvements, and Intelligent Transportation Systems and (2) institutionalizing energy efficiency and greenhouse gas emission reduction measures and technology into planning, project development, operations, and maintenance of transportation facilities, fleets, buildings, and equipment.

As shown above, the Project would likely reduce the future-year greenhouse gas emissions generated by trips through the Project area. Therefore, the Project would also lower fuel consumption associated with travel in the area. In addition, the Project would improve safety in the Project area, install curbs, gutters and sidewalks, as well as handicap accessible curb ramps throughout the Project limits.

SECTION 5: REFERENCES

Antelope Valley Air Quality Management District (AVAQMD). 2008. AVAQMD Federal 8-Hour Ozone Attainment Plan (Western Mojave Desert Non-attainment Area). May 20.

Antelope Valley Air Quality Management District (AVAQMD). 2009. Antelope Valley AQMD California Environmental Quality Act (CEQA) and Federal Conformity Guidelines. December.

California Air Pollution Control Officers Association (CAPCOA). 2008. CEQA & Climate Change, Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act. January.

California Air Resources Board (ARB). 2005. Air Quality and Land Use Handbook: A Community Health Perspective. April.

California Air Resources Board (ARB). 2007. Expanded List of Early Action Measures to Reduce Greenhouse Gas Emissions in California Recommended for Board Consideration. October 2007.

California Air Resources Board (ARB). 2008. Climate Change Scoping Plan, A Framework for Change as approved December 2008. December.

California Air Resources Board (ARB). 2009. The California Almanac of Emissions and Air Quality - 2009 Edition. March 27.

California Air Resources Board (ARB). 2010. Ambient Air Quality Standards. www.arb.ca.gov/research/aaqs/aaqs2.pdf. Last Updated September 8, 2010.

California Air Resources Board (ARB). 2011a. Almanac of Emission Projection Data, Published in 2009: Estimated Annual Average Emissions, Antelope Valley AQMD, All Sources. Website: http://www.arb.ca.gov/app/emsinv /emseic1_query.php. Accessed March 3, 2011.

California Air Resources Board (ARB). 2011b. Historical Air Quality, Top 4 Summary. www.arb.ca.gov/adam/cgi-bin/db2www/adamtop4b.d2w/start. Accessed: March 2, 2011.

California Department of Conservation, Division of Mines and Geology (DMG). 2000. A General Location Guide for Ultramafic Rocks in California - Areas More Likely to Contain Naturally Occurring Asbestos. August.

California Department of Transportation (Caltrans). 2006. Climate Action Program at Caltrans. December.

California Energy Commission, California Climate Change Center (CEC). July 2006. Our Changing Climate, Accessing the Risks to California. CEC-500-2006-077. www.energy.ca.gov/2006publications/CEC-500-2006-077/CEC-500-2006-077.PDF, Accessed in November 2008.

California Environmental Protection Agency (OEHAA). 2002. Office of Environmental Health Hazard Assessment. Health Effects of Diesel Exhaust. Website: www.oehha.ca.gov/public_info/facts/pdf/diesel4-02.pdf. Accessed July 1, 2010.

Climate Change (IPCC). 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M.Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, http://www.ipcc.ch/ipccreports/ar4-wg1.htm, Accessed November 6, 2008.

Council on Environmental Quality (CEQ). 2010. Memorandum for Heads of Federal Departments and Agencies. Draft NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions. February 18.

Palmdale, City of. 1993. Palmdale General Plan. January 25.

Ryan Kuo, South Coast Association of Governments. Personal Communication March 15.

San Joaquin Valley Air Pollution Control District (SJVAPCD). 2012. Ambient Air Quality Standards and Valley Attainment Status. Website: http://www.valleyair.org/aqinfo/attainment.htm. Accessed July 3, 2013.

State of California, Environmental Protection Agency, Climate Action Team (CAT). 2006. Climate Action Team Report to Governor Schwarzenegger and the California Legislature. Website: www.climatechange.ca.gov /climate_action_team/reports/index.html. Accessed January 21, 2009.

U.S. Department of Transportation Federal Highway Administration. Memorandum: Information: Interim Guidance on Air Toxic Analysis in NEPA Documents. February 3, 2006.

U.S. Environmental Protection Agency (EPA). 1997. Office of Air and Radiation. Nitrogen Oxides: Impact on Public Health and the Environment. Website: www.epa.gov/ttn/oarpg/t1/reports/noxrept.pdf. Accessed November 2008.

U.S. Environmental Protection Agency (EPA). 2007. Six Common Air Pollutants. Health and Environmental Impacts of NOx. Website: www.epa.gov/air /urbanair/nox/hlth.html. Accessed November 2008.

U.S. Environmental Protection Agency (EPA). September 2003. Particle Pollution and your Health. EPA-452/F-03-001. Website: http://epa.gov/pm/pdfs/pm-color.pdf. Accessed November 2008.

U.S. Environmental Protection Agency (EPA). 1999. Ozone and your Health. EPA-452/F-99-003. Website: www.epa.gov/air/ozonepollution/pdfs/health.pdf. Accessed November 2008.

U.S. Environmental Protection Agency. 2011. The Green Book Nonattainment Areas for Criteria Pollutants. Website: http://www.epa.gov/oaqps001/greenbk/. Accessed March 1, 2011.

U.S. Environmental Protection Agency. Health Assessment Document for Diesel Engine Exhaust. EPA/600/8-90/057F. May 2002. http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=29060. Accessed in November 2008.

University of California, Davis (UCD). 1997. Prepared for California Department of Transportation. Transportation Project-Level Carbon Monoxide Protocol.

Western Regional Climate Center (WRCC). 2011. Palmdale Station Period of Record Monthly Climate Summary. Website: http://www.wrcc.dri.edu/Climsum.html. Accessed March 2, 2011.

Western Regional Climate Center. Fresno SWO AP Station 043257, Monthly Climate Summary. Website http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca3257. Accessed July 9, 2013

Appendix A:
2011 RTP and 2013 FTIP Documentation

Appendix B:
IAC Memo and FHWA Concurrence

Appendix C:
CO Protocol Flow Charts

Appendix D:
CO Hotspot Analysis

Appendix E:
Roadway Construction Emissions Model Output

Appendix F:
CalEEMod Output

Appendix G:
EMFAC2011 Output

Appendix C:
Biological Resources Report

Natural Environment Study

(Minimal Impacts)

Fulton Mall, City of Fresno
Fresno County, California

Federal Project # TCSPL-5060(263)

July 1, 2013

STATE OF CALIFORNIA
Department of Transportation

Prepared By: Tommy Molioo, First Carbon Solutions
714.508.4100

Prepared For: California Department of Transportation

1. Summary

A Natural Environment Study - Minimal Impacts (NES-MI) was prepared for the City of Fresno for the proposed Fulton Mall Project. The Biological Study Area (BSA) for this NES-MI consists of approximately 65.5 acres located in the City of Fresno, Fresno County, California. The project involves converting the pedestrian paths associated with the Fulton Mall into multi-use roadways. The proposed project would allow multi-use access to the Fulton Mall and three cross street mall sections, Merced Mall, Mariposa Mall, and Kern Mall.

The purpose of the proposed project is to improve parking and vehicle access to local businesses on Fulton Street in order to maximize sustainable development and economic productivity in conjunction with other downtown redevelopment projects. The proposed project would also be intended to lower crime and improve safety for people walking between parking areas and businesses located on the Fulton Mall and for people who live in, work in, and visit the project area.

The BSA is comprised of developed and disturbed land associated with existing developments such as the Fulton Mall, associated buildings and structures, vehicle parking, pedestrian pathways, access roads and Chukchansi ballpark. The BSA contains no suitable habitat for any federal or state listed plant or wildlife species. No potentially jurisdictional drainages or mapped blue-line streams occur within or immediately adjacent to the BSA and no regulatory permitting would be required for the proposed project.

The BSA is not within any United States Fish and Wildlife Service (USFWS) designated critical habitat and is not within a designated wildlife movement corridor. The BSA is not within any approved or proposed Habitat Conservation Plan (HCPs) or Natural Community Conservation Plans (NCCPs). The BSA contains some suitable nesting habitat for resident and migratory bird species protected under the Migratory Bird Treaty Act (MBTA) and California Fish and Game Code (CFG Code). Avoidance and minimization measures would be required to minimize impacts to migratory birds, if construction activities take place during the avian nesting season from February 15th through September 1st.

2. Introduction

The City of Fresno, in cooperation with the California Department of Transportation (Caltrans), proposes to convert the pedestrian paths associated with the Fulton Mall into multi-use roadways to reintroduce vehicle traffic into the Downtown Mall Area.

2.1 Project Location

The BSA is regionally located near the central portion of the City of Fresno, within Fresno County, south of State Route (180), west of SR-41 and east of SR-99 (Appendix A). The BSA is depicted on the Fresno South, California, United States Geological Survey (USGS) 7.5-minute topographic quadrangle in Sections 3, 4, 9 and 10 of Township 14 South, Range 20 East. The proposed project is specifically located north of Inyo Street, south of Tuolumne Street, east of Broadway Street and west of Van Ness Avenue. The BSA for the project is depicted on Appendix B.

2.2 Project Description

The California Department of Transportation (Caltrans), as assigned by the Federal Highway Administration (FHWA), in cooperation with the City of Fresno (City) proposes to reconstruct Fulton Mall as a complete street by reintroducing vehicle traffic lanes to the existing pedestrian mall. The Mall consists of six linear blocks that were open to traffic prior to 1964 but now do not allow public vehicle access. The Mall is bounded by Tuolumne Street to the north and Inyo Street to the south, and includes portions of three cross streets. The total length of the new roadways would be 0.74 mile. Figures 1-1 and 1-2 show project vicinity and location maps.

The “Mall” refers specifically to the pedestrian areas between adjoining buildings located on the former City streets of Fulton, Mariposa, Merced, and Kern, which function as an integrated pedestrian Mall. Fresno Street and Tulare Street, which do allow vehicle traffic, run through the Mall and divide it into three roughly equal sections. Mall landscaping elements include fountains, planters, benches, sculptures, electrical systems, irrigation systems, and two “tot lots.” The Mall does not include the adjoining buildings or their facades.

Each Build Alternative proposes to reconstruct the Mall using “complete streets” design concepts. Complete streets are those designed to function as shared public space, or as “living streets”—for pedestrians, cyclists, outdoor businesses, and slow-moving, cautiously driven vehicles. Complete streets may include narrow roadways, corner bulb-outs, winding streets, and other traffic calming measures to lower driving speeds; street trees and other landscape elements; wide pedestrian sidewalks and crosswalks; and bicycle accommodations such as dedicated bicycle lanes or wide shoulders. The purpose of incorporating these design concepts into the proposed project is to retain portions of the historic fabric

and character of the Mall, maintaining the key elements, feeling and unique experience of a pedestrian mall in downtown Fresno.

The proposed project has three Alternatives, including two Build Alternatives and a No Build Alternative.

Alternative 1 consists of reopening the Mall with two-way streets, with one lane of vehicular traffic in each direction alongside bicycle, pedestrian, and potentially other travel modes. On-street vehicle parking spaces would be reintroduced along the length of the Mall (including cross streets), and construction of streetscape improvements would optimize the streets for the new blend of travel modes. One 11-foot vehicle travel lane would run in each direction, with a parallel parking lane of 9 feet included on both sides of the streets. A 20-foot sidewalk included on both sides of the streets would allow for walking and pedestrian-only seating, landscaping, lighting, and public art.

The existing 20 works of sculpture present on the Mall today would all remain, though some may be moved to be incorporated in sidewalk areas of the new streetscape. Only the three fountains found along the Kern Mall, west of Fulton, would remain. All of the planter beds and raised seating areas found along the Mall today would be removed in favor of wide sidewalks that incorporate artwork and seating areas. The two tot lots present, one located near the corner of Merced and Fulton, and the other located near the corner of Kern and Fulton, would be relocated and potentially combined into one larger tot on Kern Mall between Fulton Street and Home Run Alley, or near the corner of Mariposa and Fulton. Impacts to native earth during project construction are not anticipated.

Alternative 2 consists of reconnecting the street grid as in Alternative #1, but would include rebuilding distinctive elements of the Mall in five to six specific locations, known as “vignettes.” The vignettes would include many of the existing elements (sculptures, fountains, pavement pattern, trees, etc.). One 11-foot vehicle travel lane would run in each direction and would curve through the vignettes to avoid existing landscape features. Outside the vignette areas, the street would be straight, and the landscape would include a 9-foot parallel parking lane and a pedestrian-only walking, seating, vegetation, and public art area 20 feet in width on one or both sides of the street. Within the vignettes, the existing Mall landscape elements would be kept maximally intact. The remaining space on each side of the street would be dedicated to pedestrian travel, seating, vegetation, and artwork.

A total of 12 fountains—9 in vignettes and 3 on Kern Mall west of Fulton—would remain in place. The 12 fountains would be fully rebuilt or restored to working order. Fourteen of 20 sculptures would remain in their precise current locations. The other 6 fountains (along with the various tile mosaics benches on the Mall today) would be configured differently within the current right-of-way to accommodate the new streetscape. Street lighting outside the vignettes would be contemporary and pedestrian-oriented, but the original Mall fixtures would be rehabilitated within each vignette. The 2 tot lots present, one located near the corner of Merced and Fulton, and the other located near the corner of Kern and Fulton, would be relocated and potentially combined into one larger tot on Kern Mall between Fulton Street and Home Run

Alley, or near the corner of Mariposa and Fulton. Impacts to native earth during project construction are not anticipated.

The third Alternative is the no-build Alternative. New streets would not be constructed and the Mall would remain as it now exists.

3. Study Methods

A review and assessment of the natural resources was conducted within the BSA, and analyzed the potential for sensitive biological resources to occur within the BSA. An informal assessment of potential jurisdictional waters and wetlands was also included in the review. The following section discusses the methods used for these studies.

3.1 Studies Required

Prior to the completion of the biological study, the impact area was reviewed and compared to the topographic map and aerial photographs. The BSA encompassed the proposed impact area and immediately surrounding habitat, for a total survey area of approximately 65.5 acres (Appendix B).

3.2 Literature Review

As part of the study of the biological resources within the BSA, a literature review was conducted of the environmental setting of the BSA. Literature reviewed included the United States Department of Agriculture (USDA 1971) Soil Survey for the BSA, the USGS topographic quadrangles queried for the California Natural Diversity Database (CNDDB 2013) (Appendix C) including the Fresno South, Fresno North, Clovis and Malaga quadrangles, and literature detailing the habitat requirements of sensitive species occurring in the vicinity of the BSA. The CNDDB Geographic Information System (GIS) database was utilized, together with ArcGIS software, to determine sensitive species located within a 5-mile radius of the BSA.

The entire BSA was assessed to verify the extent of plant communities and to determine the presence of suitable habitat for sensitive plant and wildlife species. Parameters assessed included soil conditions, presence of indicator species, slope, aspect, and hydrology.

Plant communities were mapped using 7.5-minute USGS topographic base maps and aerial photography. The plant communities within the BSA were classified according to the California Department of Fish and Wildlife (CDFW) List of Terrestrial Natural Communities (2003) and cross-referenced to descriptions provided in Holland’s Preliminary Descriptions of the Terrestrial

Natural Communities of California (1986 and 1992 update). The California Natural Plant Society (CNPS) Inventory of Rare and Endangered Plants was also reviewed (Appendix D).

3.3 Personnel and Survey Dates

The biological study was completed by Biologist Tommy Molioo of Michael Brandman Associates. Mr. Molioo has over five years experience conducting and managing biological resources studies. A site visit to the BSA was conducted by Senior Archeologist Michael Dice of Michael Brandman Associates on April 3, 2013 with other Michael Brandman Associates staff and City personnel. Site photos and general notes of the BSA were taken onsite by Mr. Dice. The information provided by Mr. Dice was compiled with first-hand knowledge of the BSA, downtown portion of the City of Fresno, and the Fresno city limits and zone of influence, to determine the biological resources within the BSA.

3.4 Assessment of Jurisdictional Waters and Wetlands

The assessment of jurisdictional waters and wetlands was conducted by Tommy Molioo on April 22, 2013. Mr. Molioo has over five years experience assessing waters and wetlands for potential regulatory agency jurisdiction. A formal jurisdictional and wetland delineation, consistent with the USACE 1987 "Federal Manual for Identifying and Delineating Jurisdictional Wetlands," was not conducted; however, the BSA was systematically inspected to record existing conditions, including any potentially jurisdictional drainage features.

4. Environmental Setting

4.1 Description of the Existing Biological and Physical Conditions

Study Area

The BSA encompasses the project impact area and a buffer around the impact area (Appendix B). The buffer was not based on a fixed measurement but rather on land uses and surrounding habitat. The BSA is approximately 65.5 acres, including the entirety of the proposed Fulton Mall project footprint with a buffer extending out to encompass any potential impacts that may occur during construction activity.

Physical Conditions

The BSA is located on the eastern side of the San Joaquin Valley on the valley floor west of the Sierra Nevada Mountains. The BSA occurs on relatively flat land at an elevation of approximately 290 feet above mean sea level.

The BSA is mapped by the Natural Resource Conservation Service (NRCS) as containing four separate soil series: Delhi loamy sand (3 to 9 percent slopes) Hanford sandy loam, Madera loam, and San Joaquin sandy loam (0 to 3 percent slopes). The soils within the majority of the BSA have been significantly altered from their natural state because of grading and compaction for the construction of the existing Fulton Mall and adjacent buildings and infrastructure.

4.2 Regional Species and Habitats of Concern

Based on the most current version of the California Natural Diversity Database (CNDDB), one sensitive plant community, eight sensitive plant species and fifteen sensitive wildlife species were previously recorded to occur within the Fresno South, Fresno North, Clovis, and Malaga, California USGS topographic quadrangles (Appendix C). For the purpose of this NES (MI) NEPA document, only the federally listed species were analyzed for their potential to occur within the BSA. A detailed description and analysis of each species, including habitat type and potential for occurrence, is included in Appendix E, Sensitive Species Tables. Based on the CNDDB, five federally listed plant species and four federally listed wildlife species have been recorded within 5 miles of the BSA. The five federally listed plant species include succulent owl's clover (*Castilleja campestris ssp. succulenta*), California jewel-flower (*Caulanthus californicu*s), San Joaquin Valley Orcutt grass (*Orcuttia inaequalis*), hairy Orcutt grass (*Orcuttia pilosa*), and Greene's tuctoria (*Tuctoria greenei*). The four federally listed wildlife species include vernal pool fairy shrimp (*Branchinectia lynchi*), California tiger salamander (*Ambystoma californiense*), western yellow-billed cuckoo (*Coccyzus americanus occidentalis*), Fresno kangaroo rat (*Dipodomys nitratoides exilis*).

The BSA is located within a disturbed and developed area characterized by concrete pavement and buildings with scattered ornamental trees. As shown in the photographs located in Appendix F, no native or natural habitat occurs within the BSA or has the potential to occur within the BSA. The five federally listed plant species listed above as well as in Appendix E occur within grassland or vernal pool habitats, which are not found within the BSA. The four federally listed wildlife species listed above as well as in Appendix E can be found in grassland, vernal pool, and/or riparian habitats, which do not occur within the BSA. Therefore, there is no suitable habitat for any federally listed species recorded within 5 miles of the BSA.

The BSA is located in the central portion of the City of Fresno and is surrounded by urban development to the north, south, east, and west. Therefore, the proposed project would have no effect on any federally listed plant or wildlife species.

4.3 Vegetation

The BSA is characterized by one habitat type, urban/developed land. The entirety of the BSA has been previously developed for the construction of the Fulton Mall and associated infrastructure, various buildings and a ballpark. Ornamental trees are scattered throughout the BSA, primarily as landscaping along paved pedestrian paths and adjacent to existing buildings. No natural vegetation or habitats occur within the BSA.

The vegetation present within the BSA consists of landscaped ornamental trees such as fig (*Ficus* sp.) pine (*Pinus* sp.), and gum (*Eucalyptus* sp.), with scattered non-native grasses and ruderal (weedy) species including, red brome (*Bromus rubens*), barley (*Hordeum murinum*), and Bermuda grass (*Cynodon dactylon*). These ornamental trees, non-native grasses and ruderal species occur within landscaped and disturbed areas associated with the paved pedestrian paths.

4.4 Animals

Wildlife species expected to occur within the BSA include common avian species typically observed in disturbed settings and urban environments such as, northern mockingbird (*Mimus polyglottos*), house finch (*Carpodacus mexicanus*), common raven (*Corvus corax*), and mourning dove (*Zenaida macroura*). Other wildlife species expected to occur onsite include western fence lizard (*Sceloporus occidentalis*) and domestic dog (*Canis familiaris*). The buildings associated with the Fulton Mall may provide suitable roosting habitat for bat species known to occur in the area such as California myotis (*Myotis californicus*). The trees located within Fulton Mall do not provide suitable habitat for tree roosting species and none are expected to occur within the landscaped trees within the Mall.

The BSA is located in the downtown portion of the City of Fresno and is surrounded by development in all directions. The BSA does not demonstrate connectivity with any undeveloped habitat, does not function as a wildlife movement corridor for species moving through the area, and approval of the project would not reduce the potential for wildlife to move through the area.

5. Project Impacts

The proposed project would be contained entirely within developed areas associated with the existing Fulton Mall and associated access roads, parking, and paved pedestrian paths. The proposed project would convert the existing paved pedestrian paths into multi-use roadways to facilitate an increase in vehicle traffic. All project impacts would occur to existing developed areas and no native vegetation would be removed as a result of construction of the project. The

developed areas associated with the Fulton Mall do not provide suitable habitat for any sensitive biological resources, and there would be no effect on sensitive plant or wildlife species, particularly federally listed species.

The project site provides suitable nesting habitat for a number of common resident and migratory bird species protected under the Migratory Bird Treaty Act (MBTA) and California Fish and Game (CFG) Code Section 3500. The ornamental landscaped trees located throughout the Fulton Mall project provide suitable nesting habitat for common species such as house sparrow (*Passer domesticus*) and lesser goldfinch (*Carduelis psaltria*). Both build options of the proposed project would result in the removal of approximately 160 public and street trees located along the existing pedestrian paths and access roads associated with the Fulton Mall. If the removal of the landscaped trees occurs during the general avian breeding season of February 15th to September 1st, nesting bird species may be directly and/or indirectly impacted. Therefore, additional avoidance and minimization measures are required.

Since the buildings associated with Fulton Mall may provide suitable roosting habitat for bat species, construction activities, involving construction noise, may result in indirect effects on bat species, particularly if construction activities occur during the maternity roosting season of May through September. Therefore, avoidance and minimization measures are required.

During the construction phase of the proposed project, noxious and invasive weeds may be introduced to the project site from construction equipment and personnel vehicles. The project is proposing to improve and revitalize Downtown Fresno, which also involves creating an aesthetically pleasing outdoor space, and the potential introduction of noxious weeds is considered a significant effect. Noxious weeds and invasive species control would need to be implemented into the project to reduce the potential for the introduction of noxious weeds to no effect.

The project site and BSA do not occur within any potentially jurisdictional drainages or wetlands and no regulatory agency coordination or permitting is required. The project site is not within a known wildlife movement corridor. The project site is not within a USFWS designated critical habitat area, and the site is not within a local HCP or NCCP area.

6. Mitigation Measures

Both project build alternatives would remove approximately 160 trees associated with the Fulton Mall, and replace them with approximatley the same number of trees (i.e., 160 trees for Alternative 1 and 160 trees for Alternative 2). The replacement planting of trees needs to select species from the City of Fresno Master Tree List to limit the potential for unacceptable or nuisance trees to be planted within the City.

Since construction of the proposed project may potentially impact nesting resident and migratory birds, avoidance and minimization measures are recommended to decrease potential impacts to nesting birds. It is recommended that construction activity occur outside of the nesting season, which typically extends from February 15th through September 1st, but can vary based on seasonal conditions. If construction activity must proceed during the nesting season, a pre-construction nesting bird survey must be conducted within 30-days of tree removal. If an active nest is observed, a suitable buffer would be placed around the active nest and no construction activities may commence without the discretion of an onsite monitoring biologist. If no active nests are observed, construction activity would have no effect on nesting resident and migratory birds and no further measures are required.

Since construction of the proposed project may potentially impact bat species roosting within the buildings associated with Fulton Mall, avoidance and minimization measures are recommended to decrease potential impacts to roosting bats. It is recommended that construction activity occur outside of the maternity roosting season, which typically extends from May 1st through September 30th, but can vary based on seasonal conditions. If construction activity must proceed during the materity roosting season, a pre-construction roosting bat survey must be conducted within 15-days of construction. If an active roost is observed or detected, a suitable buffer would be placed around the active roost and no construction activities may commence without the discretion of an onsite monitoring biologist. If no active roosts are observed, construction activity would have no effect on roosting resident bats and no further measures are required.

Noxious weeds would be handled in accordance with both Caltrans Highway Design Manual topic 110.5 “Control of Noxious Weeds--Exotic and Invasive Species” and Executive Order 13112 (Invasive Species) and by methods approved by Caltrans’ landscape architect and/or vegetation control specialist.

This project would not introduce, transport, or spread invasive species and would not change the surrounding habitat to encourage immigration of invasive species to the site.

7. Permits Required

No local, state or federal permits are required for construction of the proposed project. Construction of the proposed project would not impact any state or federally listed species, would not result in any impacts to a potentially jurisdictional drainage feature or wetland, would not remove any habitat potentially suitable for a state or federally listed species nor would it affect any USFWS-designated Critical Habitat. Additionally no potentially jurisdictional waters or drainages will be impacted by the proposed project. Therefore, a U.S. Army Corps of Engineers Nationwide or 404 Permit, a CDFW Section 1600 Streambed Alteration Agreement or a Regional Water Quality Control Board Section 401 Certification are not required for the proposed project.

8. References

Burt, W.H., and Grossenheider, R.P., 1980. Peterson Field Guides, Mammals. Houghton Mifflin Company. New York, New York.

California Department of Fish and Game. 2003 (September). List of California Terrestrial Natural Communities Recognized by the California Natural Diversity Database. California Department of Fish and Game, Wildlife and Habitat Data Analysis Branch. Sacramento, California.

California Department of Fish and Wildlife (CDFW). California Natural Diversity Database (CNDDB). 2013. RareFind 4 online database. Data Base Record Search for Information on Threatened, Endangered, Rare, or Otherwise Sensitive Species for the Fresno North, Fresno South, Clovis and Malaga, California USGS Topographic Quadrangles. California Department of Fish and Game, State of California Resources Agency. Sacramento, California.

California Native Plant Society (CNPS). 2006. Inventory of Rare and Endangered Plants (online edition, v6-05a). California Native Plant Society. Sacramento, CA. Accessed on April 22, 2013 from http://www.cnps.org/inventory

Hickman, J.C. 1993. The Jepson Manual: Higher Plants of California. University of California Press. Berkeley, California.

Holland, R.F. 1986. Preliminary Descriptions of the Terrestrial Natural Communities of California. Non-game Heritage Program. California Department of Fish and Game, Sacramento, California.

Holland, R.F. 1992 Update. Preliminary Descriptions of the Terrestrial Natural Communities of California. Non-game Heritage Program. California Department of Fish and Game, Sacramento, California.

Munz, P.A. 1974. A Flora of Southern California. University of California Press. Berkeley, California.

National Geographic Society. 1987. National Geographic Society Field Guide to the Birds of North America. 2nd Edition. National Geographic Society. Washington, DC.

Oberbauer, T., 1996. Terrestrial Vegetation Communities in San Diego County Based on Holland's Descriptions, 6p.

Sawyer, J.O. and T. Keeler-Wolf. 1995. A Manual of California Vegetation. California Native Plant Society. Sacramento, California.

Sibley, D.A. 2003. The Sibley Filed Guide to Birds of Western North America. Alfred A. Knopf, New York, USA. 471 p.

Skinner, M.W., and B.M. Pavlik. 1994. California Native Plant Society's Inventory of Rare and Endangered Vascular Plants of California. California Native Plant Society. Special Publication, No. 1, 5th ed.

Stebbins, R.C. 1985. A Field Guide to Western Reptiles and Amphibians. 2nd. Ed. Houghton-Mifflin Company. Boston, Massachusetts.

U.S. Department of Agriculture. 1962. Soil Survey: Madera County, California. Department of the Interior. U.S. Government Printing Office. Washington, DC.

9. Appendices

A - Regional Vicinity Map

B - Biological Study Area and Project Area

C - California Natural Diversity Data Base List

D - CNPS Inventory of Rare and Endangered Plants List

E - Special Status Species Tables

F - Photographs

Certification

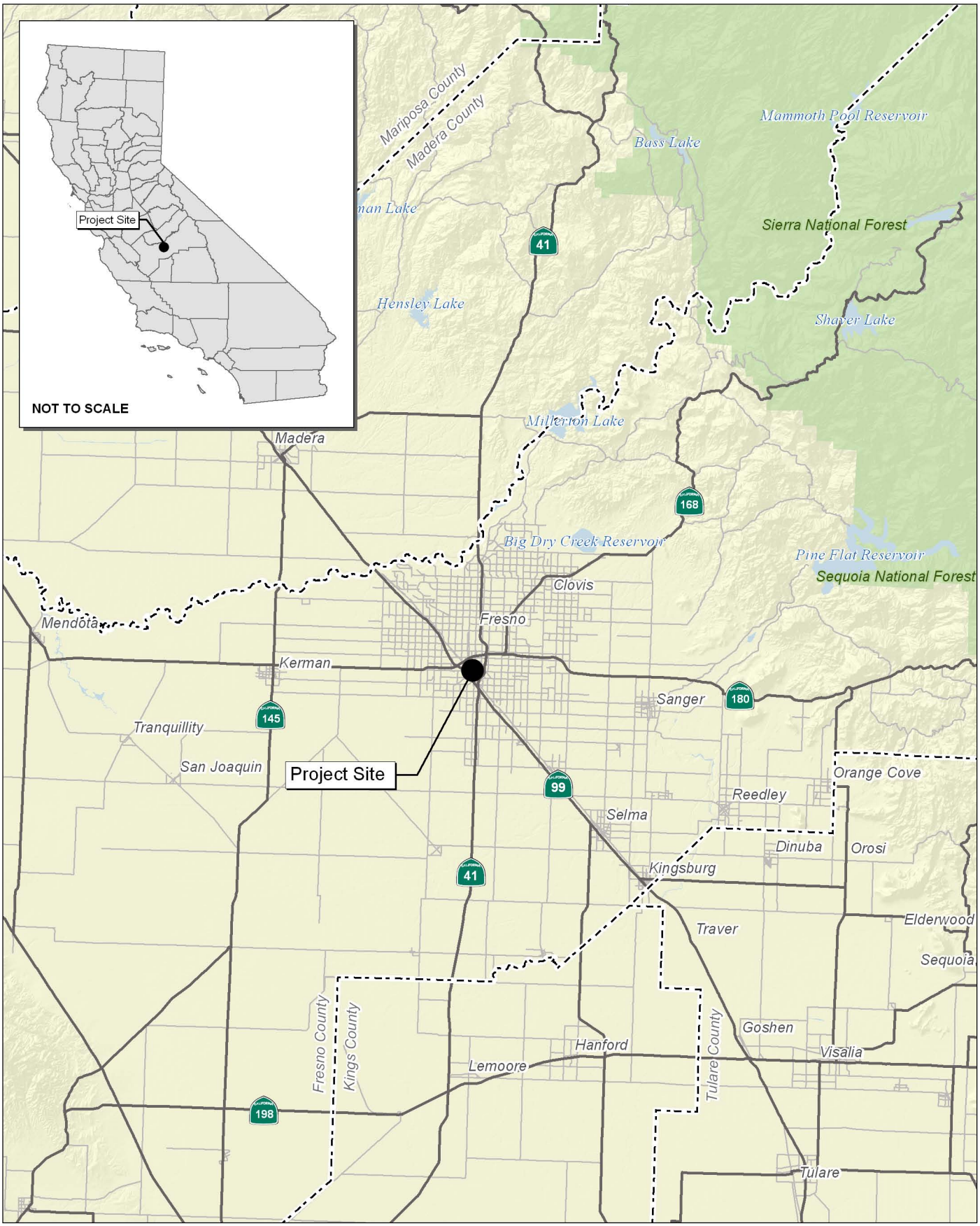
I hereby certify that the statements furnished above and in the attached exhibits present data and information required for this biological evaluation, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.

Date: July 01, 2013 Signed: _____

Tommy Molioo
Biologist
Michael Brandman Associates
220 Commerce, Suite 200
Irvine, CA 92602

H:\Client (PN-JN)\3168\31680017\NES MI\31680017 Fulton Mall NES MI 07-01-2013.doc

Appendix A - Regional Vicinity Map



Source: Census 2000 Data, The CaSIL, MBA GIS 2013.

NORTH

10 5 0 10 Miles

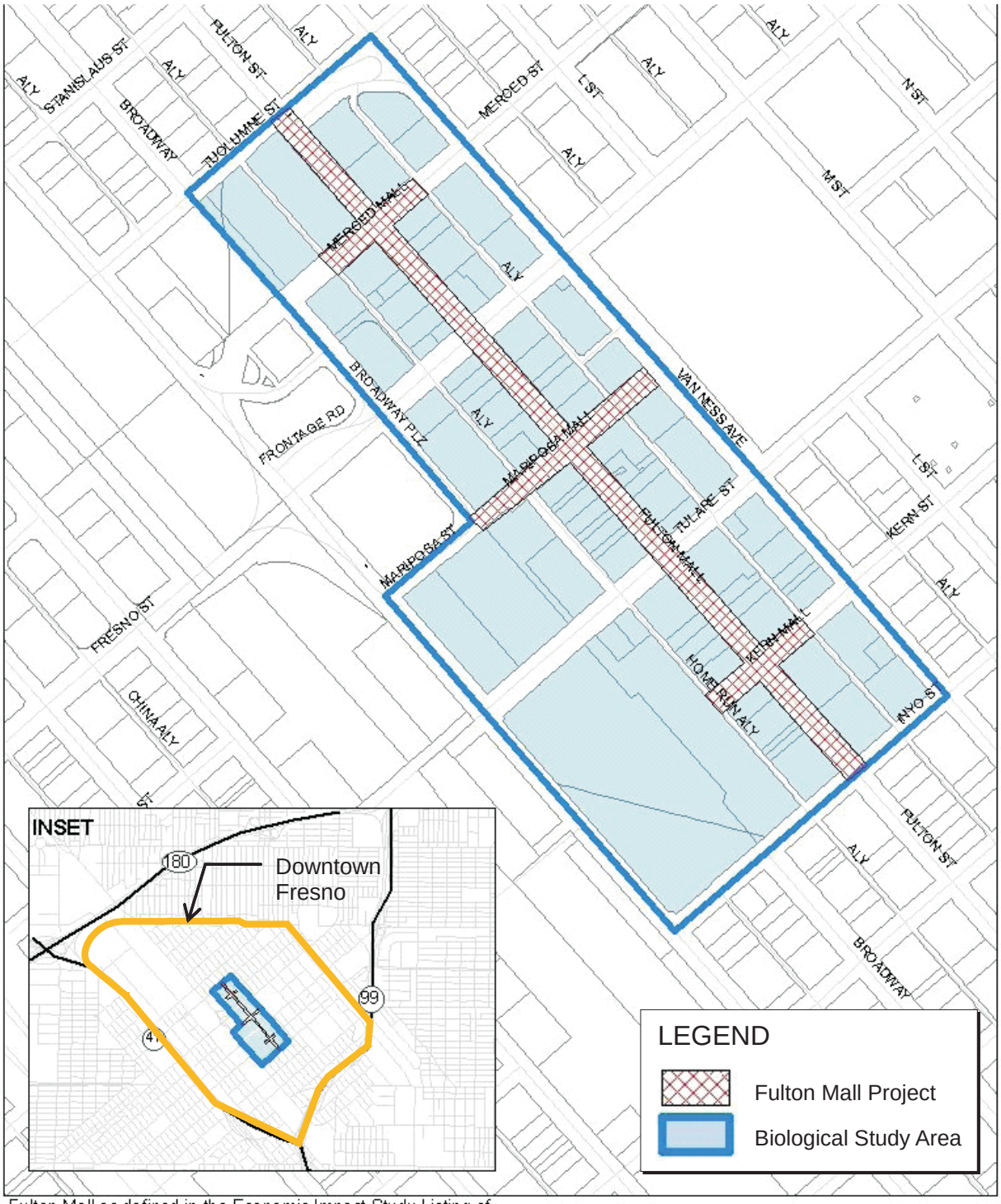
Michael Brandman Associates

31680017 • 06/2013 | A_regional.mxd

Appendix A
Regional Vicinity Map

CITY OF FRESNO • FULTON MALL PROJECT
NATURAL ENVIRONMENT STUDY – MINIMAL IMPACTS

Appendix B - Biological Study Area Map



\1 Fulton Mall as defined in the Economic Impact Study Listing of Fulton Mall on National Register of Historic Places (September 2008)
\2 Study Area as defined in Chapter 4 of the Fulton Corridor Specific Plan (PUBLIC DRAFT, 14 October 2011)

Michael Brandman Associates

Appendix B
Biological Study Area and Project Area

Appendix C - California Natural Diversity Data Base List

CALIFORNIA DEPARTMENT OF FISH and WILDLIFE

Quad is (Fresno South (3611967) or Fresno North (3611977) or Clovis (3611976) or Malaga (3611966))

CNDDB Element Query Results

ScientificName	CommonName	ElementCode	OccCount	GlobalRank	StateRank	FederalListingStatus	StateListingStatus	CNPSList	OtherStatus	Habitat
Agelaius tricolor	tricolored blackbird	ABPBXB0020	428	G2G3	S2	None	None		ABC_WLBCC -Watch List of Birds of Conservation Concern | BLM_S-Sensitive | CDFW_SSC-Species of Special Concern | IUCN_EN-Endangered | USFWS_BCC -Birds of Conservation Concern	Freshwater marsh | Marsh and swamp | Swamp | Wetland
Ambystoma californiense	California tiger salamander	AAAAA01180	1054	G2G3	S2S3	Threatened	Threatened		CDFW_SSC-Species of Special Concern | IUCN_VU-Vulnerable	Cismontane woodland | Meadow and seep | Riparian woodland | Valley and foothill grassland | Vernal pool | Wetland
Antrozous pallidus	pallid bat	AMACC10010	402	G5	S3	None	None		BLM_S-Sensitive | CDFW_SSC-Species of Special Concern | IUCN_LC-Least Concern | USFS_S-Sensitive | WBWG_H-High Priority	Chaparral | Coastal scrub | Desert wash | Great Basin grassland | Great Basin scrub | Mojavean desert scrub | Riparian woodland | Sonoran desert scrub | Upper montane coniferous forest | Valley and foothill grassland
Branchinecta lynchi	vernal pool fairy shrimp	ICBRA03030	608	G3	S2S3	Threatened	None		IUCN_VU-Vulnerable	Valley and foothill grassland | Vernal pool | Wetland
Castilleja campestris ssp. succulenta	succulent owl's-clover	PDSCR0D3Z1	90	G4?T3	S3	Threatened	Endangered	1B.2		Valley and foothill grassland | Vernal pool | Wetland
Caulanthus californicus	California jewel -flower	PDBRA31010	63	G1	S1	Endangered	Endangered	1B.1	USFS_S-Sensitive	Chenopod scrub | Pinon and juniper woodlands | Valley and foothill grassland
Coccyzus americanus occidentalis	western yellow-billed cuckoo	ABNRB02022	119	G5T3Q	S1	Candidate	Endangered		BLM_S-Sensitive | USFS_S-Sensitive | USFWS_BCC -Birds of Conservation Concern	Riparian forest
Dipodomys nitratoides exilis	Fresno kangaroo rat	AMAFD03151	12	G3T1	S1	Endangered	Endangered		IUCN_VU-Vulnerable	Chenopod scrub
Efferia antiochi	Antioch efferian robberfly	IIDIP07010	4	G1G3	S1S3	None	None			Interior dunes

Eumops perotis californicus	western mastiff bat	AMACD02011	293	G5T4	S3?	None	None		BLM_S-Sensitive | CDFW_SSC-Species of Special Concern | WBWG_H-High Priority	Chaparral | Cismontane woodland | Coastal scrub | Valley and foothill grassland
Imperata brevifolia	California satintail	PMPOA3D020	31	G2	S2.1	None	None	2.1	USFS_S-Sensitive	Chaparral | Coastal scrub | Meadow and seep | Mojavean desert scrub | Riparian forest | Wetland
Lasiurus cinereus	hoary bat	AMACC05030	235	G5	S4?	None	None		IUCN_LC-Least Concern | WBWG_M-Medium Priority	Broadleaved upland forest | Cismontane woodland | Lower montane coniferous forest | North coast coniferous forest
Leptosiphon serrulatus	Madera leptosiphon	PDPLM09130	27	G1?	S1?	None	None	1B.2	USFS_S-Sensitive	Cismontane woodland | Lower montane coniferous forest
Lindériella occidentalis	California lindériella	ICBRA06010	382	G3	S2S3	None	None		IUCN_NT-Near Threatened	Vernal pool
Lytta molesta	molestan blister beetle	IICOL4C030	17	G2	S2	None	None			Vernal pool | Wetland
Metapogon hurdi	Hurd's metapogon robberfly	IIDIP08010	3	G1G3	S1S3	None	None			Interior dunes
Northern Claypan Vernal Pool	Northern Claypan Vernal Pool	CTT44120CA	21	G1	S1.1	None	None			Vernal pool | Wetland
Orcuttia inaequalis	San Joaquin Valley Orcutt grass	PMPOA4G060	47	G1	S1	Threatened	Endangered	1B.1		Vernal pool | Wetland
Perognathus inornatus inornatus	San Joaquin pocket mouse	AMAFD01061	109	G4T2T3	S2S3	None	None		BLM_S-Sensitive	Coastal scrub | Valley and foothill grassland
Sagittaria sanfordii	Sanford's arrowhead	PMALI040Q0	88	G3	S3	None	None	1B.2	BLM_S-Sensitive	Marsh and swamp | Wetland
Spea hammondii	western spadefoot	AAABF02020	422	G3	S3	None	None		BLM_S-Sensitive | CDFW_SSC-Species of Special Concern | IUCN_NT-Near Threatened	Cismontane woodland | Coastal scrub | Valley and foothill grassland | Vernal pool | Wetland
Taxidea taxus	American badger	AMAJF04010	454	G5	S4	None	None		CDFW_SSC-Species of Special Concern | IUCN_LC-Least Concern	Alkali marsh | Alkali playa | Alpine | Alpine dwarf scrub | Bog and fen | Brackish marsh | Broadleaved upland forest | Chaparral | Chenopod scrub | Cismontane woodland | Closed-cone coniferous forest | Coastal bluff scrub | Coastal dunes |

										Coastal prairie | Coastal scrub | Desert dunes | Desert wash | Freshwater marsh | Great Basin grassland | Great Basin scrub | Interior dunes | Ione formation | Joshua tree woodland | Limestone | Lower montane coniferous forest | Marsh and swamp | Meadow and seep | Mojavean desert scrub | Montane dwarf scrub | North coast coniferous forest | Oldgrowth | Pavement plain | Redwood | Riparian forest | Riparian scrub | Riparian woodland | Salt marsh | Sonoran desert scrub | Sonoran thorn woodland | Ultramafic | Upper montane coniferous forest | Upper Sonoran scrub | Valley and foothill grassland
Tropidocarpum capparideum	caper-fruited tropidocarpum	PDBRA2R010	18	G1	S1	None	None	1B.1	USFS_S-Sensitive	Valley and foothill grassland
Tuctoria greenei	Greene's tuctoria	PMPOA6N010	46	G1	S1	Endangered	Rare	1B.1	USFS_S-Sensitive	Vernal pool | Wetland

Copyright © 2013 State of California

Appendix D - CNPS Inventory of Rare and Endangered Plants List

CNPS California Native Plant Inventory of Rare and Endangered Plants

Plant List

11 matches found. *Click on scientific name for details*

Search Criteria

Found in Fresno County, Found in 9 Quads around 36119G7

Scientific Name	Common Name	Family	Lifeform	Rare Plant Rank	State Rank	Global Rank
Castilleja campestris ssp. succulenta	succulent owl's-clover	Orobanchaceae	annual herb (hemiparasitic)	1B.2	S3	G4?T3
Caulanthus californicus	California jewel-flower	Brassicaceae	annual herb	1B.1	S1	G1
Downingia pusilla	dwarf downingia	Campanulaceae	annual herb	2.2	S2	G2
Eryngium spinosepalum	spiny-sepaled button-celery	Apiaceae	annual / perennial herb	1B.2	S2.2	G2
Imperata brevifolia	California satintail	Poaceae	perennial rhizomatous herb	2.1	S2.1	G2
Leptosiphon serrulatus	Madera leptosiphon	Polemoniaceae	annual herb	1B.2	S1?	G1?
Orcuttia inaequalis	San Joaquin Valley Orcutt grass	Poaceae	annual herb	1B.1	S1	G1
Pseudobahia bahiifolia	Hartweg's golden sunburst	Asteraceae	annual herb	1B.1	S2	G2
Sagittaria sanfordii	Sanford's arrowhead	Alismataceae	perennial rhizomatous herb	1B.2	S3	G3
Tropidocarpum capparideum	caper-fruited tropidocarpum	Brassicaceae	annual herb	1B.1	S1	G1
Tuctoria greenei	Greene's tuctoria	Poaceae	annual herb	1B.1	S1	G1

Suggested Citation

California Native Plant Society (CNPS). 2013. Inventory of Rare and Endangered Plants (online edition, v8-01a). California Native Plant Society. Sacramento, CA. Accessed on Monday, April 29, 2013.

Search the Inventory
- Simple Search
- Advanced Search
- Glossary

Information
- About the Inventory
- About the Rare Plant Program
- CNPS Home Page
- About CNPS
- Join CNPS

Contributors
- Jenkins Family
- Bilisoly Bequest Grant
- California Natural Diversity Database
- The Calflora Database
- Studio Simple
- TRC

© Copyright 2010 California Native Plant Society. All rights reserved.

Appendix E - Special Status Species Tables

Appendix E.1: Special-Status Plant Species Table

Special Status Plant Species Table

Species		Status			Preferred Habitat	Life Form	Blooming Period	Potential to Occur/ Known Occurrence/ Suitable Habitat
Scientific Name	Common Name	USFWS	CDFW	CNPS				
Atriplex persistens	vernal pool smallscale	—	—	1B.2	This species occurs within vernal pools, specifically alkaline vernal pools. Known Elevation Limits: 33 – 377 ft.	Annual herb	Jun – Oct	**Not Likely to Occur.** The BSA occurs within the Fresno River floodplain that does not contain any vernal pools. Additionally the BSA is significantly disturbed from previous and ongoing disturbances.
Castilleja campestris ssp. *succulenta*	succulent owl's clover	FT	SE	1B.2	Succulent owl's clover occurs in vernal pools within valley and foothill grasslands. Known Elevation Limits: 82 – 2,460 ft.	Annual herb	Apr – May	**Not Likely to Occur.** The project site and BSA are located within an entirely disturbed and developed area. No vernal pools or any native habitat occur within the BSA.
Caulanthus californicus	California jewel-flower	FE	SE	1B.1	This species occurs within chenopod scrub, valley and foothill grassland, and pinyon-juniper woodland. It is historically found from various valley habitat in both the central valley and the Carrizo Plain. Known Elevation Limits: 213 – 2,952 ft.	Annual herb	Feb – May	**Not Likely to Occur.** The project site and BSA are located within an entirely disturbed and developed area. No chenopod scrub, grasslands, juniper woodlands, or any native habitat occur within the BSA.
Leptosiphon serrulatus	Madera leptosiphon	—	—	1B.2	This species occurs within cismontane woodland and lower montane coniferous forests, on dry slopes	Annual herb	Apr – May	**Not Likely to Occur.** The BSA occurs partially within the Fresno River floodplain and partially within urban/developed areas.

Species		Status						
Scientific Name	Common Name	USFWS	CDFW	CNPS	Preferred Habitat	Life Form	Blooming Period	Potential to Occur/ Known Occurrence/ Suitable Habitat
					and often on decomposed granite woodland. Known Elevation Limits: 984 – 4,265 ft.			No woodland habitat occurs within or immediately adjacent to the BSA. Additionally the BSA is significantly disturbed from previous and ongoing disturbances.
Orcuttia inaequalis	San Joaquin Valley Orcutt grass	FT	SE	1B.1	This species is only found in vernal pools. Known Elevation Limits: 50 – 2,165 ft.	Annual herb	Apr – Sep	**Not Likely to Occur.** The project site and BSA are located within an entirely disturbed and developed area. No vernal pools or any native habitat occur within the BSA.
Orcuttia pilosa	hairy Orcutt grass	FE	SE	1B.1	This species typically occurs along the margins of vernal pools. Known Elevation Limits: 150 – 656 ft.	Annual herb	May – Sep	**Not Likely to Occur.** The BSA occurs within the Fresno River floodplain that does not contain any vernal pools. Additionally the BSA is significantly disturbed from previous and ongoing disturbances.
Tuctoria greenei	Greene's tuctoria	FE	SR	1B.1	Greene's tuctoria only occurs in vernal pools. It can specifically be found on the dry bottoms of vernal pools in open grasslands. Known Elevation Limits: 98 – 3,510 ft.	Annual herb	May – Sep	**Not Likely to Occur.** The project site and BSA are located within an entirely disturbed and developed area. No vernal pools, grasslands or any native habitat occur within the BSA.

Species		Status			Preferred Habitat	Life Form	Blooming Period	Potential to Occur/ Known Occurrence/ Suitable Habitat
Scientific Name	Common Name	USFWS	CDFW	CNPS				

U.S. Fish and Wildlife Service
FE Federal Endangered
FT Federal Threatened

California Department of Fish and Game
SE State Endangered
ST State Threatened
SR State Rare

California Native Plant Society
1A Plants presumed extinct in California.
1B Plants rare, threatened, or endangered in California and elsewhere.
2 Plants rare, threatened, or endangered in California, but more common elsewhere.
3 Plants in need of more information.
4 Plants of limited distribution.
** No Longer Recognized as Sensitive by CNPS

Not Likely to Occur – There are no present or historical records of the species occurring on or in the immediate vicinity, (within 3 miles) of the Project Site and the diagnostic habitats strongly associated with the species do not occur on or in the immediate vicinity of the Site.

Low Potential to Occur – There is a historical record of the species in the vicinity of the Project Site and potentially suitable habitat on Site, but existing conditions, such as density of cover, prevalence of non-native species, evidence of disturbance, limited habitat area, isolation, substantially reduce the possibility that the species may occur. The Site is above or below the recognized elevation limits for this species.

Moderate Potential to Occur – The diagnostic habitats associated with the species occur on or in the immediate vicinity of the Project Site, but there is not a recorded occurrence of the species within the immediate vicinity (within 3 miles). Some species that contain extremely limited distributions may be considered moderate, even if there is a recorded occurrence in the immediate vicinity.

High Potential to Occur – There is both suitable habitat associated with the species and a historical record of the species on or in the immediate vicinity of the Project Site (within 3 miles).

Species Present – The species was observed on the Project Site at the time of the survey or during a previous biological survey.

Appendix E.2: Special-Status Wildlife Species Table

Special Status Wildlife Species Table

Species		Status			Required Habitat	Potential to Occur/ Known Occurrence/ Suitable Habitat
Scientific Name	Common Name	Federal	State	Other		
Arthropods						
Branchinecta lynchi	vernal pool fairy shrimp	FT	—	—	This species inhabits the Central Valley of California, from Contra Costa to Kern and Tulare Counties. This beetle can be found in dry vernal pools, but absent from adjacent green/flowering, non pool vegetation.	**Not Likely to Occur.** No suitable habitat for this species occurs on or in the immediate vicinity of the BSA. No vernal pool habitat occurs within the BSA. This species was not observed during the survey.
Reptiles and Amphibians						
Ambystoma californiense	California tiger salamander	FT	ST	DFW: SSC	This salamander needs underground refuges, especially ground squirrel burrows and vernal pools or other season water sources for breeding.	**Not Likely to Occur.** No suitable habitat occurs on or in the immediate vicinity of the BSA for this species. The BSA does not contain vernal pools or ground squirrel burrows. This species was not observed during the survey.
Avian						
Athene cunicularia	burrowing owl	—	—	DFW: SSC	This speices is known to occur within open, dry annual or perennial grasslands, and in deserts and scrublands characterized by low-growing vegetation. The burrowing owl is a subterranean nester, dependant upon burrowing mammals, most notably, the California ground squirrel.	**Not Likely to Occur.** No suitable nesting habitat for this species occurs within the survey area due to lack of small mammal burrows. Marginally suitable foraging opportunities occurs within limited portions of the BSA; however, existing anthropogenic disturbances would likely deter this species from utilizing the area.

Species		Status			Required Habitat	Potential to Occur/ Known Occurrence/ Suitable Habitat
Scientific Name	Common Name	Federal	State	Other		
Coccyzus americanus occidentalis	western yellow-billed cuckoo	FC	SE	USFS: Sensitive	This bird is a riparian forest nester, primarily along the broad, lower flood-bottoms of larger river systems. It nests in riparian jungles of willow, often mixed with cottonwoods, with lower story of blackberry, nettles, or wild grape.	**Not Likely to Occur.** The BSA occurs within Downtown Fresno and is characterized by disturbed and developed land. No riparian areas or riparian forests are located within the BSA. Ornamental trees occur within the BSA, but are not native willow or cottonwood trees.
Mammals						
Dipodomys nitratoides exilis	Fresno kangaroo rat	FE	SE	-	Fresno kangaroo rat occurs in alkali sink-open grassland habitats in western Fresno County. It prefers bare alkaline clay-based soils subject to seasonal inundation, with more friable soil mounds around shrubs and grasses.	**Not Likely to Occur.** The BSA is characterized by heavily disturbed and completely developed land. No native friable soils occur onsite due to paving of the BSA for the construction of Downtown Fresno.
Lasiurus cinereus	hoary bat	—	—	—	This species prefers open habitats or habitat mosaics, with access to trees for cover and open areas or habitat edges for feeding. It roosts in dense foliage of medium to large trees and feeds primarily on moths. Requires water.	**Not Likely to Occur.** No suitable roosting or foraging habitat occurs within the BSA. Swallow nests occur underneath the Schnoor Avenue Bridge and no dense stands of trees occur within the Fresno River floodplain. This species was not observed during the survey.

Species		Status			Required Habitat	Potential to Occur/ Known Occurrence/ Suitable Habitat
Scientific Name	Common Name	Federal	State	Other		

Federal

FE	Federal Endangered
FT	Federal Threatened
PFT	Proposed Federal Threatened
C	Candidate for Federal Listing
D	Delisted

State

SE	State Endangered
ST	State Threatened
CDFW:FP	Fully Protected Species
CDFW: P	Protected Species

Other

DFW:SSC	California Species of Special Concern
USFS:	Sensitive United States Forest Service
BLM:	Sensitive
G	Global Ranking Rarity
S	State Ranking Rarity

Not Likely to Occur - There are no present or historical records of the species occurring on or in the immediate vicinity, (within 3 miles) of the Project Site and the diagnostic habitats strongly associated with the species do not occur on or in the immediate vicinity of the Site.

Low Potential to Occur - There is a historical record of the species in the vicinity of the Project Site and potentially suitable habitat on Site, but existing conditions, such as density of cover, prevalence of non-native species, evidence of disturbance, limited habitat area, isolation, substantially reduce the possibility that the species may occur. The Site is above or below the recognized elevation limits for this species.

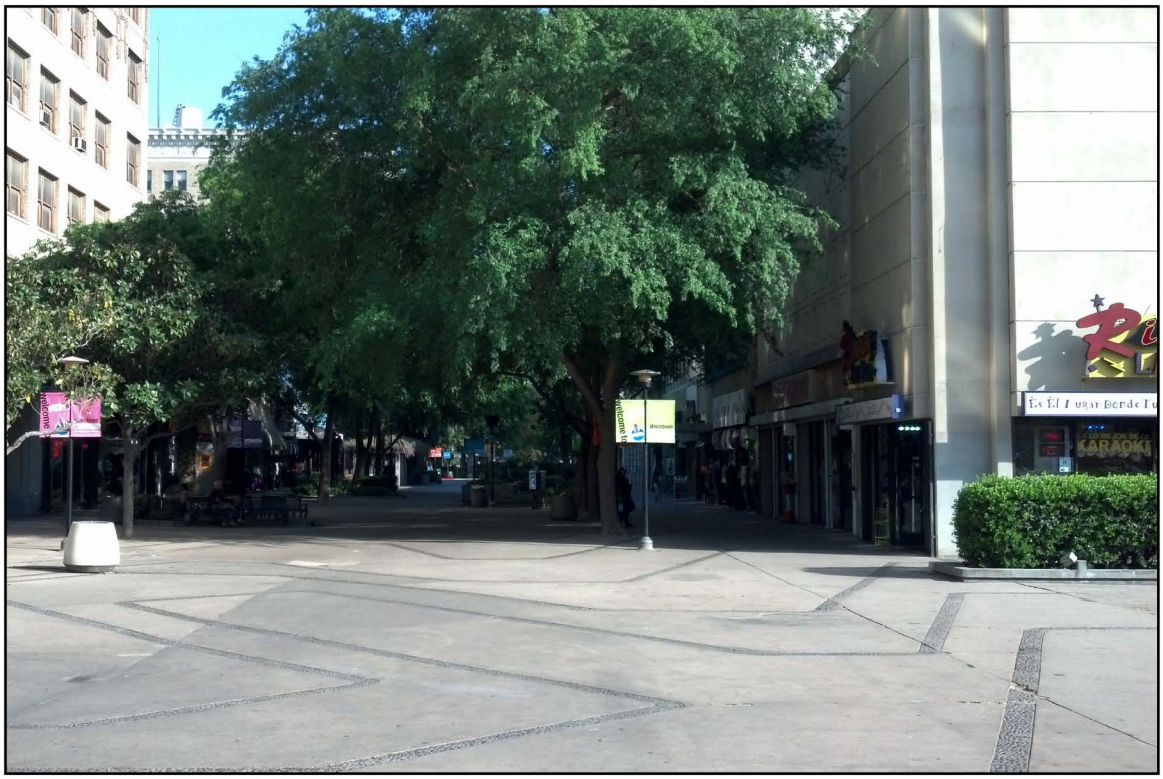
Moderate Potential to Occur - The diagnostic habitats associated with the species occur on or in the immediate vicinity of the Project Site, but there is not a recorded occurrence of the species within the immediate vicinity (within 3 miles). Some species that contain extremely limited distributions may be considered moderate, even if there is a recorded occurrence in the immediate vicinity.

High Potential to Occur - There is both suitable habitat associated with the species and a historical record of the species on or in the immediate vicinity of the Project Site (within 3 miles).

Species Present - The species was observed on the Project Site at the time of the survey or during a previous biological survey.

Appendix F - Photographs

Photograph 1: Southwest view of Mariposa Mall with 1900 Mariposa Mall building in distant background.

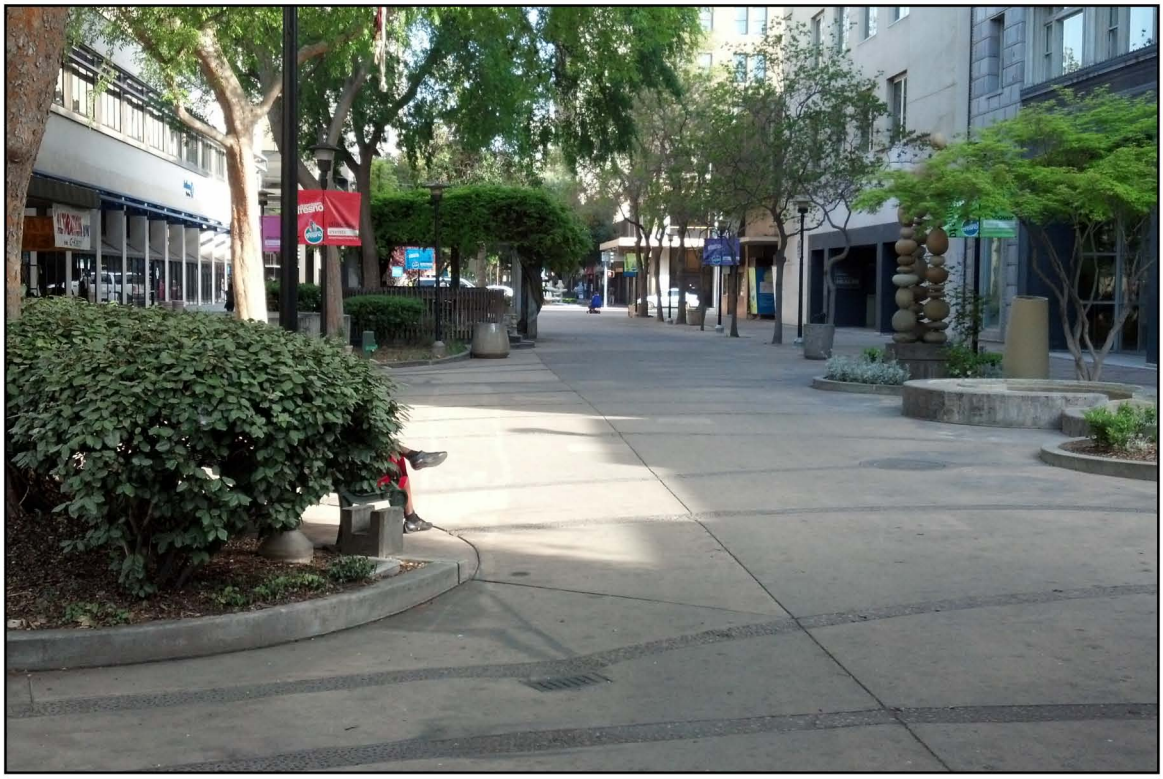


Photograph 2: Southeast view along Fulton Mall from the center of Mariposa Mall.

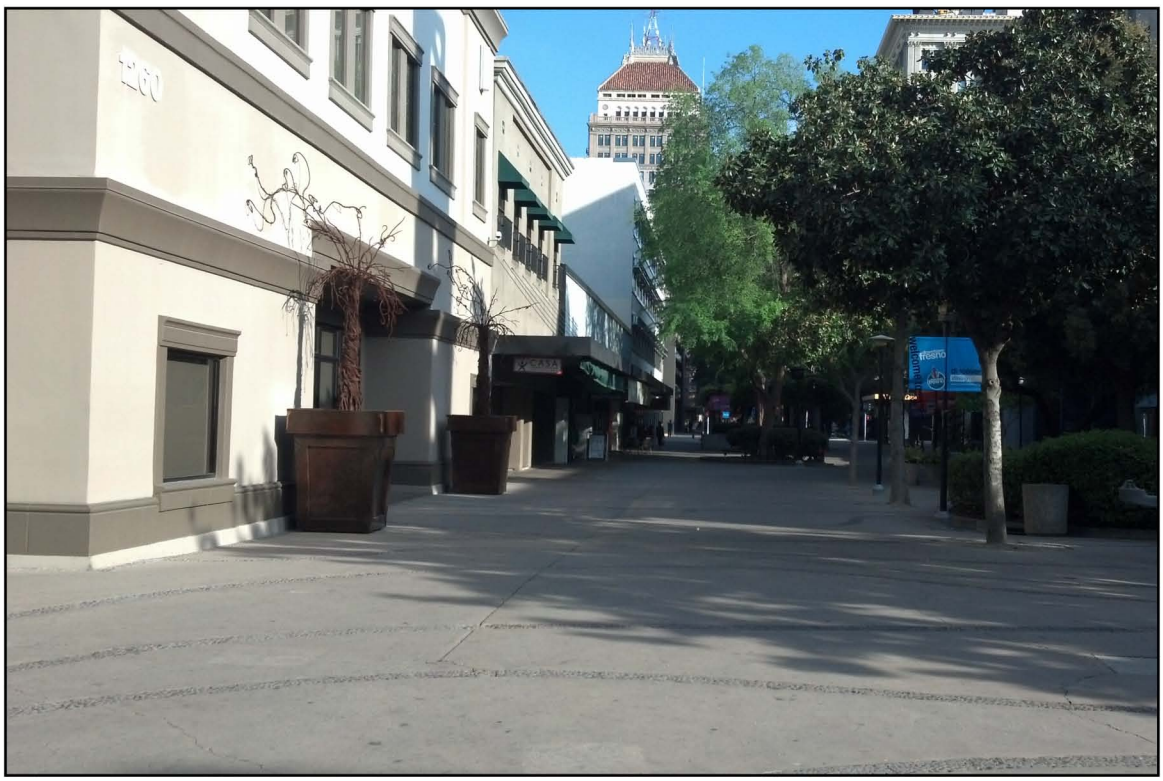
Source: Michael Brandman Associates, 2013.

Michael Brandman Associates

Appendix F
Site Photographs 1 and 2



Photograph 3: Fulton Mall overview (1215 Fulton Mall at far right), southeast view.



Photograph 4: Overview of Fulton Mall from the center of Merced Mall intersection (1260 Fulton Mall to left), southeast view.

Source: Michael Brandman Associates, 2013.

Michael Brandman Associates

Appendix F
Site Photographs 3 and 4

Appendix D:
Cultural Resources Report

D.1 - Archaeological Report

Fresno Fulton Corridor Specific Plan and Downtown Neighborhoods Community Plan Project

Archaeological Resources Assessment Report

Prepared for

Moule & Polyzoides

180 East California Boulevard
Pasadena, CA 91105

Contact: Juan Gomez-Novy

Prepared by

Greenwood and Associates

725 Jacon Way
Pacific Palisades, CA 90272

Dana N. Slawson, M. Arch.
Michael Kay, M.A., RPA

February 2012

Contents

Section **Page**

1.0 Introduction 1
1.1 Project Description 1

2.0 Environmental Setting 8
2.1 Methods 8
2.1.1 Research Sources Consulted 8
2.1.2 Research Methods 8
2.2 Background 12
2.2.1 Physical Environment 12
2.2.2 Regional Cultural Setting 14
2.2.3 Historical Setting 18
2.3 Records Search Results 31
2.3.1 Archaeological Resources 31
2.3.2 Literature and Archival Review Summary 35
2.3.3 Native American Consultation Summary 35
2.4 Field Investigation Results 35
2.4.1 Archaeological Resources 35

3.0 Environmental Impacts 48
3.1 Standards of Significance 48
3.1.1 Historical Resources 48
3.1.2 Thresholds for Significant Impacts 51
3.2 Project Impacts 51
3.2.1 Archaeological Resources 51
3.2.2 Cumulative Impacts 54

4.0 Recommended Mitigation Measures 55
4.1 Archaeological Resources 55
4.2 FCSP/DNCP Impacts 57
4.3 Archaeological Policy Statements 57

5.0 References 59

Tables

2-1 Archaeological Surveys in Vicinity of Plan Areas 31

Figures

1-1 FCSP/DNCP Location Map 2
1-2 FCSP Districts 4
1-3 DNCP Subareas 6
2-1 Combined FCSP/DNCP indicated on USGS Fresno North, Fresno South, Clovis, and Malaga, CA, 7.5' topographic maps 13
2-2 20-acre Fresno area colony farm, ca. 1880 20
2-3 H Street, looking north from Tulare Street, 1884 21
2-4 Mariposa Street, ca. 1890 22
2-5 Mariposa Street, 1920s.. 24
2-6 1891 Bird's eye view of Block 50. 28
2-7 Locations of Archaeological Field Investigations 37
2-8 1898 Sanborn map detail of Block 50. 39
2-9 Detail of 1918 Sanborn map of Block 1052 46

Appendices

A Native American Consultation

B Archaeological Site Records

C Block-by-Block Archival Research Summary

1.0 Introduction

Greenwood and Associates has conducted an archaeological resources investigation for the proposed Fulton Corridor Specific Plan and Downtown Neighborhoods Community Plan Project, located in the City of Fresno, Fresno County, California. This document assesses the potential environmental consequences of the project on archaeological resources, based on review of available resource records, literature and archival sources, background research, and limited field investigations. The information contained in this report is prepared to provide environmental compliance pursuant to the California Environmental Quality Act (CEQA) and municipal enactments.

1.1 Project Description

Background

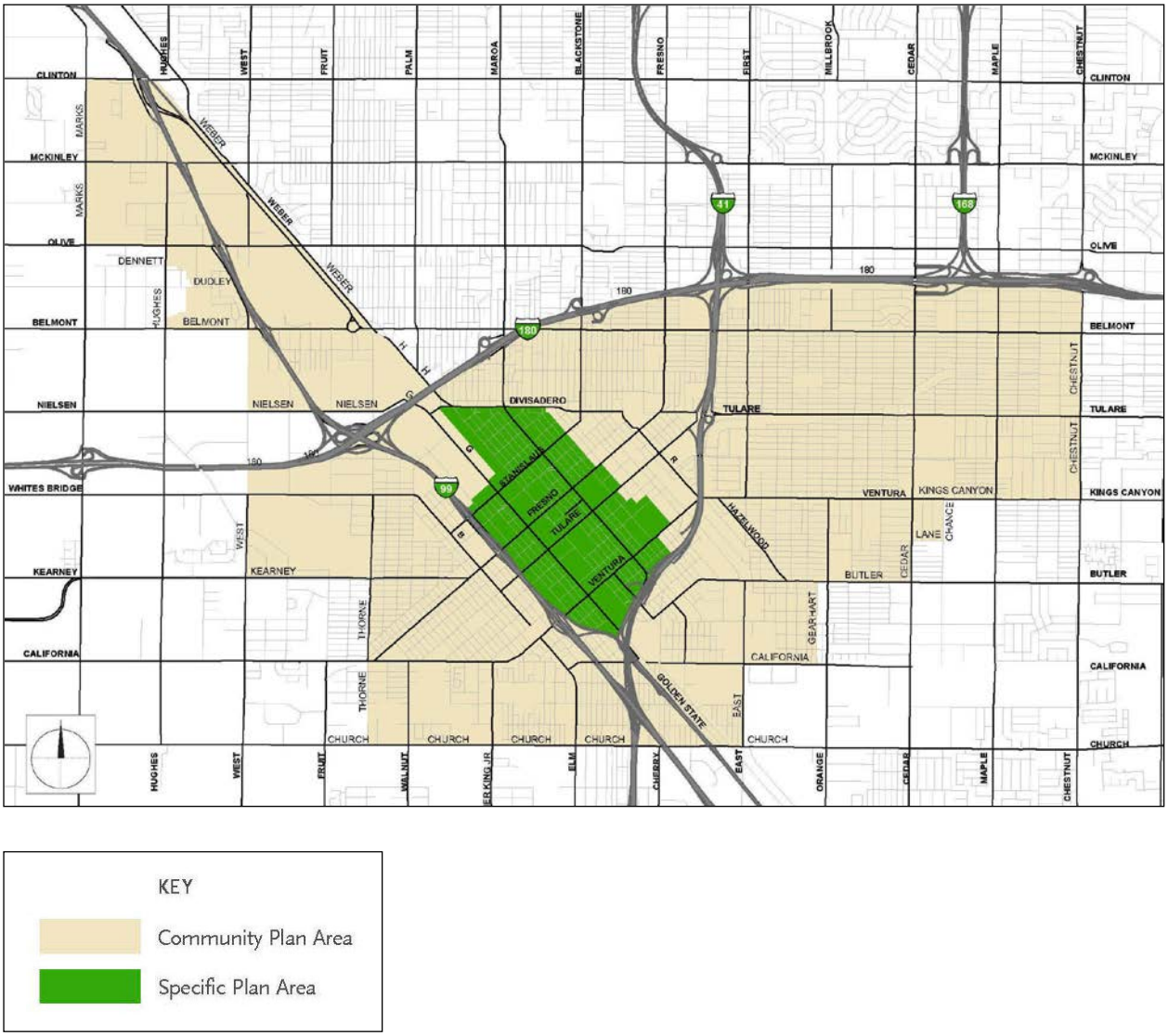
Fresno is located in the heart of California's San Joaquin Valley, approximately 190 miles southeast of San Francisco and 220 miles northwest of Los Angeles. The Valley is one of the largest and most productive farming regions in the world. Fresno is also the gateway to Yosemite National Park, Sierra National Forest, Kings Canyon National Park, and Sequoia National Park. Regional access to Fresno from the north and south is provided by Highways 99 and 41, from the west by Highway 180, and from the east by Highways 168 and 180.

This survey of archaeological resources encompasses both the Fulton Corridor Specific Plan area and the Downtown Neighborhoods Community Plan Area. The Fulton Corridor Specific Plan (FCSP) Area is completely surrounded by the Downtown Neighborhoods Community Plan Area (Figure1-1). It covers approximately 655 acres and is generally bounded to the north by Divisadero Street, to the west by Highway 99, to the south by Highway 41, and to the east by N Street, O Street, and the alley between M and N Streets. The Plan Area is divided by the Union Pacific railroad right-of-way.

The Downtown Neighborhoods Community Plan (DNCP) boundaries embrace those Fresno neighborhoods, districts, and corridors that were laid out prior to the Second World War. Encompassing approximately 7,290 acres, the DNCP is roughly bounded by Highway 180 on the north, Chestnut Street to the east, and Marks, West and Thorne Avenues on the west. Church and Butler Avenues and Kings Canyon Road form the principal southern boundaries.

Fulton Corridor Specific Plan

While the General Plan and associated community plans provide policy guidance for Fresno's on-going evolution, and the day to day, neighborhood by neighborhood, lot by lot "steering mechanism" for changing the built environment is guided by the zoning code and other related municipal standards, the Specific Plan is a tool that enables a community to define a clear and specific vision for the future evolution of a specified planning area. The Fulton Corridor Specific Plan provides a road map for growth and change for the plan area for at least the next 25 years – until the year 2035 and beyond. It is comprised of unique and customized standards that enable the City to shape or reshape its streets and public spaces, and property owners to develop or redevelop their properties according to the vision of the Specific Plan. It guides public and private reinvestment and construction in a highly coordinated and integrated way in



KEY

Community Plan Area

Specific Plan Area

Figure 1-1. FCSP/DNCP Location Map.

order to yield specific types of urban places that are the result of discussion, debate, and consensus by a majority of the community.

The Specific Plan guides and focuses public investment on essential infrastructure and streetscape projects that, in turn, will incentivize private parties to improve their property with the certainty that they are supported by long-term public commitment. The primary purposes of the Specific Plan are to define:

1. A Vision for the future of Downtown that recognizes the importance of history and tradition while embracing opportunities for continued growth and beneficial change.
2. Goals and policies that work in tandem with and refine those of the General Plan and the Downtown Neighborhoods Community Plan.
3. New zoning standards for the Plan Area that will replace current zoning. These are calibrated to deliver new development that is consistent with Fresno's physical character, history, and culture, as well as the community's vision for its future growth.
4. The implementation strategy for transforming the Plan Area's streets, infrastructure, parks, and other public spaces.

Specific Plan Districts

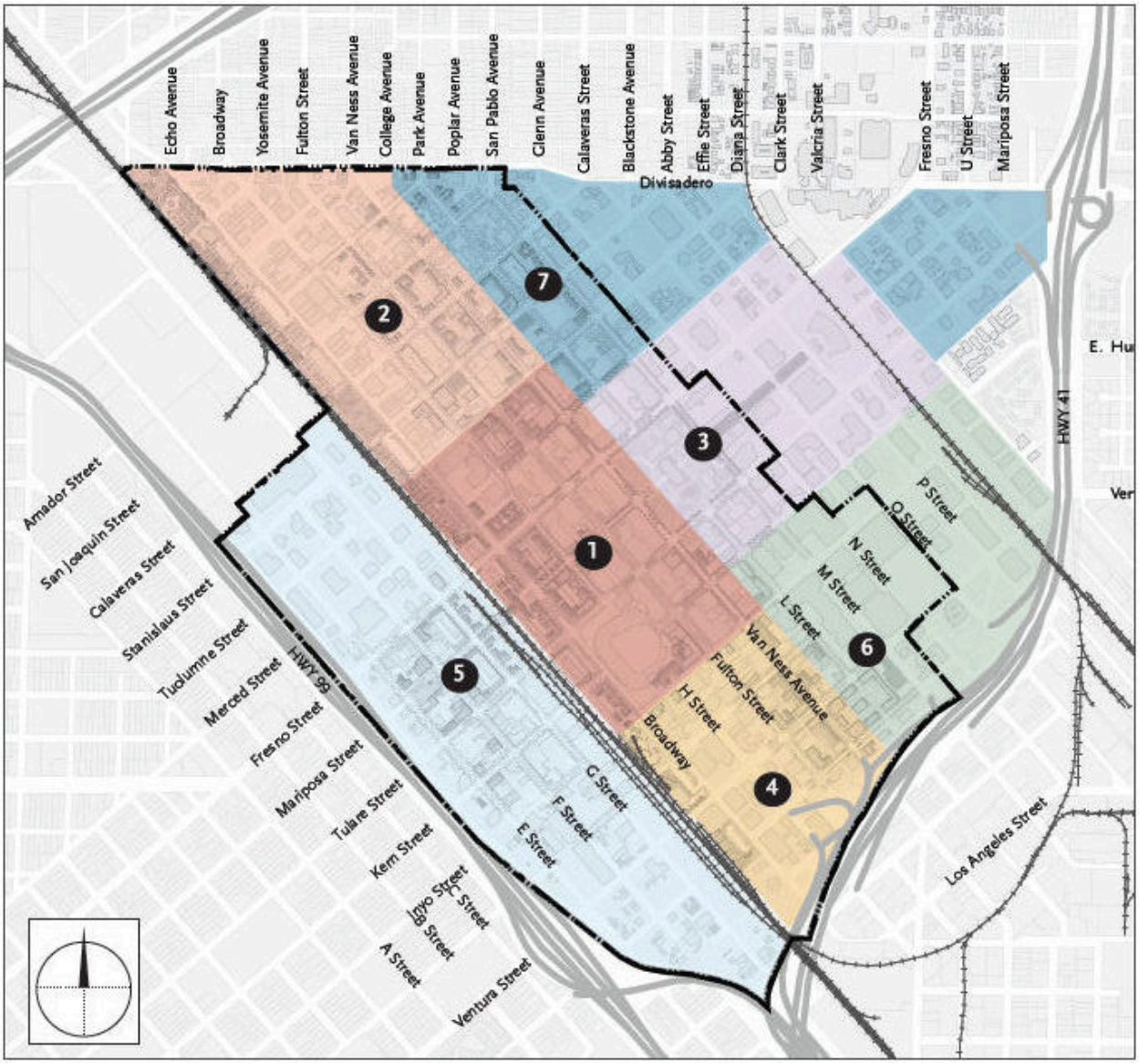
There are seven distinct districts within the FCSP boundaries. These are among the oldest, most diverse, and most densely developed areas in the City of Fresno. The boundaries of the districts, as shown in Figure 1-2, were determined primarily by the unique character of each district, based largely upon their physical form, when they were built, and the role each played in the context of the city. The seven districts are described below.

Central Business District. The CBD is Fresno's traditional business and commercial center. It includes the Fulton Mall and its physical configuration is unmistakably that of a metropolitan urban center. The CBD is bounded by Tuolumne Street to the north, the alley between Van Ness Avenue and L Street to the east, Inyo Street to the south, and the Union Pacific railroad tracks to the west.

Cultural Arts District. The Cultural Arts District is a mostly industrial and commercial district of smaller urban loft buildings that is being reclaimed with fashionable new housing and mixed use projects. The District is bounded by Tuolumne Street to the south, the Union Pacific railroad tracks to the west, Divisadero Street to the north, and the alley between M and N Streets on the east.

Civic Center. The Civic Center is bounded by Merced Street to the north, the BNSF railroad tracks to the east, Kern Street to the south, and the alley between Van Ness Avenue and L Street to the west. Located within its boundaries are many Municipal, County, State, and Federal government buildings, including the Fresno Police Headquarters, the Fresno County Free Library, and the County Courthouse.

South Stadium District. The South Stadium district is bounded by SR 41 to the south, the Union Pacific railroad to the west, Inyo Street to the north, and O Street and the alley between Van Ness Avenue and L Street to the east. This District is also an industrial and commercial district peripheral to the CBD that is now beginning to be redeveloped on the same basis as the Cultural Arts district.



Key

1. Central Business District and Fulton Mall
2. Cultural Arts District
3. Civic Center District
4. South Stadium District
5. Chinatown
6. Armenian Town/Convention Center
7. Divisadero Triangle

Specific Plan Boundary

Figure 1-2. FCSP Districts

Chinatown. One of the oldest and most historically significant areas of Fresno, Chinatown originally comprised the area bounded by what is now State Route 99 to the west, Ventura Avenue to the south, H Street to the east, and Fresno Street to the north. The FCSP modifies the boundaries by extending them northward to include the properties just north of Stanislaus Street, and southward to where Golden State Boulevard intersects State Route 41. The Union Pacific railroad tracks form the eastern boundary.

Armenian Town/Convention Center District. This district is roughly bounded by Kern Street, O Street, SR 41, and the alley between L Street and Van Ness Avenue. As its name suggests, it comprises the remaining half of what was Armenian Town and contains the Fresno Convention Center.

Divisadero Triangle. The Divisadero Triangle is roughly bounded by Merced Street, Diana Street, Divisadero Street, and the alley between L Street and Van Ness Avenue. The District has suffered from poor patterns of redevelopment, yet contains well-formed streets, a variety of uses and distinctive buildings, including a rich housing stock.

Downtown Neighborhoods Community Plan

The Downtown Neighborhoods Community Plan is the community's tool for guiding the successful regeneration of Downtown Fresno and its surrounding neighborhoods. It is a visionary document that lays out the community's long-term goals for the Plan Area and provides detailed policies concerning a wide range of topics, including land use and development, transportation, the public realm of streets and parks, infrastructure, historic resources, and health and wellness.

The Downtown Neighborhoods Community Plan boundaries include Fresno's neighborhoods, districts, and corridors that were laid out prior to the Second World War. During this time period, Downtown was the center of the city and was bounded to the southwest, north, and east by residential neighborhoods that were connected to Downtown by street car lines and grand corridors, such as Fresno Street, Belmont Avenue, Kearney Avenue, and Blackstone Avenue. Downtown, each one of its surrounding neighborhoods and districts, and the corridors that ran through them had - and continue to have - a distinct character, largely based upon when they were built, their physical form and the role that each played in the context of the city. Downtown functioned as the central business and shopping district; the first neighborhoods began in Southwest Fresno and then, over time, expanded toward the north and east; industrial districts sprang up along the railroad tracks and south of Downtown; the corridors, accommodating neighborhood retail and services, formed the boundary between each one of these places.

In order to deal effectively with the large geographic area and comprehensive social challenges of the Community Plan, its 7,290-acre plan area has been divided into seven subareas (Figure 1-3). The seven subareas that comprise the DNCP are:

Jane Addams Neighborhoods. The 1,155-acre Jane Addams Neighborhoods is more rural in character than other subareas. It forms the agricultural edge of west Fresno and is largely disconnected from the east and south by freeways. The subarea includes Roeding Park and Fresno Chaffee Zoological Gardens.

Southwest Neighborhoods. Southwest Neighborhoods is primarily residential in character and contains some of Fresno's oldest neighborhoods. The 1,560-acre subarea is the center of Fresno's African-American community. Fresno Chandler Downtown Airport is within its boundaries.

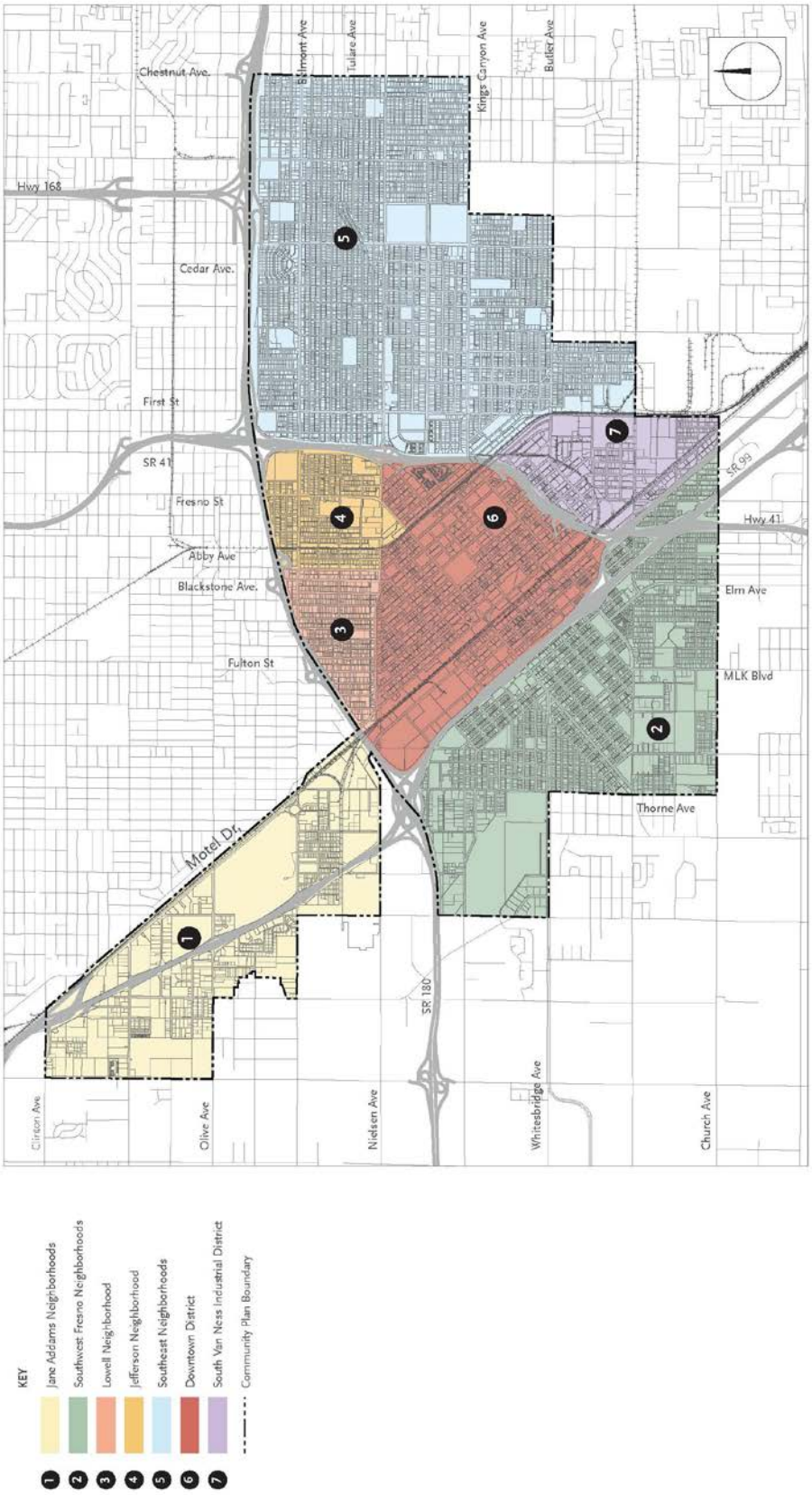


Figure 1-3. DNCP Subareas

Lowell Neighborhood. Lowell Neighborhood encompasses 225 acres and lies adjacent to the Downtown area. The neighborhood contains some of Fresno's oldest homes and has strong historic character, but is disconnected from north and west neighborhoods by State Routes 99 and 180.

Jefferson Neighborhood. The Jefferson Neighborhood is also Downtown-adjacent, but is divided in two by the BNSF railroad alignment and disconnected from neighborhoods to the north and east by State Routes 41 and 180. The 290-acre neighborhood contains some of Fresno's oldest homes, although the historic character is diminishing.

Southeast Neighborhoods. The Southeast Neighborhoods are predominantly residential, comprised primarily of single-family houses with isolated concentrations of multi-family dwellings. The 2,400-acre area suffers from a lack of neighborhood identity and a limited number of public parks.

South Van Ness Industrial. South Van Ness is a 390-acre area principally comprised of old warehouses and industrial buildings. In many places, more recent industrial mega-blocks interrupt the late nineteenth century street network and the area is lacking in street trees.

Downtown. Downtown is comprised of seven distinct districts that are discussed in the FCSP.

The goal of this Community Plan is to set up a process of regeneration in the Downtown Neighborhoods in a manner that brings about their lasting prosperity, social and physical improvement, while producing economic benefits for the City of Fresno as a whole. This will be achieved by:

- Establishing Downtown as the heart of Fresno;
- Reviving and/or transforming each of the Plan's sub-areas based upon their unique identity;
- Establishing mixed-use neighborhood centers at important intersections that are within easy walking distance of surrounding residences and connect to the existing bus and future bus rapid transit networks; and
- Reviving the Plan Area's corridors by making them more pedestrian- and bicycle-friendly through the introduction of bike lanes, street trees, and pedestrian amenities such as crosswalks, street lights, and street furniture.

The purpose of this study is to assess the potential consequences for archaeological resources of undertaking the far ranging redevelopment activities recommended by the Fulton Corridor Specific Plan and the Downtown Neighborhoods Community Plan. The study also evaluates the possibility of not implementing the proposed Specific and Community Plans, which represents the No Project Alternative.

2.0 Environmental Setting

2.1 Methods

2.1.1 Research Sources Consulted

For these archaeological resource investigations, research included literature and archival search, and review of records pertaining to documented resources and previous cultural resource studies. Field investigations were limited to a pedestrian survey which sampled parcels identified in the course of background research as possessing moderate to high potential for the presence of archaeological resources.

A search of the California Historical Resources Information System (CHRIS) was completed for the project on March 15, 2010 and updated on May 16, 2011. The records search, conducted at the Southern San Joaquin Valley Information Center (SSJVIC) at CSU Bakersfield, reviewed available literature, archaeological site and historical resources archives, and relevant historical maps and other records pertinent to the Fulton Corridor Specific Plan and Downtown Neighborhoods Community Plan Project. Information concerning cultural resources and previous studies identified by the records search within a one-quarter mile radius of the project area is summarized below.

Specialized listings for cultural resources consulted for this report include the most recent updates of the National Register of Historic Places – Listed Properties and Determined Eligible Properties; the California Register of Historical Resources; California Historical Landmarks; California Points of Historical Interest; the Directory of Properties in the Historic Property Data File for the City of Fresno; and City of Fresno Register of Historic Resources.

Additionally, specialized research was conducted at the California State University, Fresno Madden Library; Los Angeles Central (Riordan) Public Library; and the University of California, Los Angeles, Young Research Library. Reference materials secured from internet sources and other project documents were also consulted. Historical Sanborn Map Company insurance maps were accessed online using *EDR Sanborn Direct* and *ProQuest*.

2.1.2 Research Methods

Among the broad range of archival materials reviewed in the course of background research were historical documents and manuscripts, historical photographs including aerial photographs, local and regional histories, and historical maps. Perhaps the most useful resource for developing an understanding of the physical development of the City of Fresno and for identifying specific areas of interest for archaeological research was the series of Sanborn Map Company insurance maps that exists for the city. These are map sets published in 1885 (two series, January and July), 1888, 1898, 1906, 1918-1919, and 1948-1950. The Sanborn company published highly detailed maps that were principally used to aid insurance agents in assessing the degree of fire risk associated with a particular property. They illustrated, among other things, each building's use, its size and shape, number of floors, types of construction materials, types of doors and windows present, widths of streets, property boundaries, house and block numbers, etc. Of particular interest for the current investigations, the maps also indicate subsurface features, including basements (labeled B, B'st, or Bst), wells (We), water

closets or privies (WC), and hollow spaces under standing structures (OU for “open under”). Additionally, elevators, which typically required pits are indicated, as are tanks, and other buried features. The presence of any of these subsurface features may indicate the potential for intact archaeological deposits.

Sanborn maps are typically color coded, or incorporate symbols, to indicate the materials used in construction of a building’s walls. Additionally, there are often notes associated with larger structures that may identify foundation and floor materials, and structural systems employed. Buildings with brick or stone masonry walls, or concrete walls would logically require more substantial, and generally more deeply buried, foundations to support the heavier wall construction. Therefore, the remains of buildings constructed with these materials are generally better represented in the archaeological record. Unlike construction in the Eastern and Midwestern states, where freezing and cold weather storage were a primary concern, the historical use of basements in residential construction in southern and central California is uncommon. The use of brick, stone, cast-stone or concrete block, and other durable materials in building construction has also been considerably less common in this region. Archaeologically, the result of the predominance of light-weight wood frame construction for residences, as well as for smaller commercial and industrial structures, through the nineteenth and twentieth centuries, has been a very light footprint upon the landscape. Historic residential construction in southern and central California, particularly housing built by or for the working and middle classes, was often supported on little more than wooden sills, stacks of brick or stone, or insubstantial concrete piers: features swiftly obliterated by modern demolition and lot clearing practices, leaving little or no evidence of past uses.

Sanborn maps provide detailed information about urban buildings within a defined city block structure. Although the buildings within a block change over the years, it is most often the case that the block footprint and adjacent streets remain static and as they were originally laid out. It is, therefore, generally possible to determine with some degree of reliability the location of previous buildings vis-à-vis the current block layout.

There are limitations inherent in insurance map research, particularly pertaining to coverage. The maps do not provide a comprehensive picture of settlement within a community at a given time, but only a snapshot. Sanborn and other insurance maps were prepared for only the most densely developed urban areas, and emergent or sparsely populated sections of cities were typically ignored. Outlying properties that perhaps only existed briefly may be completely absent from the record. Or, a property’s date of origin may be erroneously interpreted as later because it is first recorded by a later map series. The maps can give a false sense of there having been ‘nothing there’ in the unmapped sections, which is often not the case.

Assessment of Archaeological Sensitivity

Using Sanborn insurance maps and other sources, an assessment of the level of sensitivity for historic archaeological resources was calculated for every block within the project area. Ratings of sensitivity were divided into five classes: Low, Low-Moderate, Moderate, Moderate-High, and High. Excluding information not derived from the insurance maps, these categories were defined as follows:

Low: no map data available, or; maps indicate that any archaeological deposits have most likely been destroyed or substantially disturbed by existing development, or; historical development as indicted on the maps is substantially intact and no demolished structure locations are present.

Low-Moderate: maps indicate that historic-era buildings/features have been removed and sites disturbed, but some potential survives for the presence of intact archaeological resources, e.g.,

sites of post-1900 wood frame residences or small commercial/industrial structures that have been paved over.

Moderate: maps indicate that historic-era light framed buildings/features have been removed but no significant post-demolition development or disturbance is evident. There is a potential for presence of intact archaeological resources, e.g., sites of multiple post-1900 wood framed residences or small commercial/industrial structures that have not been paved over, or; sites of multiple pre-1900 residential properties that are paved over but display potential for buried deposits (privies, wells, cisterns, etc.).

Moderate-High: maps indicate that historic buildings of heavy construction have been removed; site may or may not have surface disturbance, e.g., site of brick commercial/industrial/residential building with basement covered by pavement or, site of brick commercial/industrial building with no basement and no subsequent surface disturbance known.

High: maps indicate that historic building(s) with basement or hollow space has been removed, or residential site with wells, privies, etc., with no subsequent surface disturbance, e.g., brick commercial building with basement, parcel open dirt or grass, or, pre 1891 residential properties with indicated privies or wells and dirt or grass surface cover.

Within sections of the project area for which no insurance or other historic maps are available, assessments of sensitivity for historic archaeological resources are identified as "Low," based on the more recent development of these areas. This with the understanding that there is a chance that isolated historic development may be present on any given block.

Fresno's first municipal sewer system was begun in 1891 and steadily expanded to serve the central city area through the early 1900s. City sewers eliminated the need for privies or sewage disposal systems on individual properties. Privy remains are often the most revealing source of information within domestic archaeological sites. For this reason, pre-1900 residences with small outbuildings, sometimes marked "WC," were given more weight than comparable later properties.

The following City-designated historic districts and potential districts were identified within the FCSP/DNCP project limits:

Existing Historic Districts within Project Area

- Fresno Airport/Chandler Field (DNCP)

Proposed Historic Districts within Project Area

- *L Street Historic District.* Boundaries: Van Ness, Amador, Divisadero, N Street, Stanislaus, M St to Calaveras (FCSP/DNCP)
- *St. John's Cathedral Historic District.* Boundaries: Tulare, Q St, Fresno, Divisadero, U St (DNCP)
- *Santa Fe Warehouse Historic District.* Boundaries: P St, Tulare, R St, Ventura (DNCP)
- *Bellevue Bungalow Historic District.* Boundaries: Howard/Thesta Sts south of Belmont (DNCP)
- *East Madison Avenue Historic District.* Boundaries: Madison Ave S of Belmont, between Fresno and Mariposa (DNCP)

- *North Park Historic District.* Boundaries: Divisadero St., Blackstone Ave, Fwy 180, and Roosevelt Ave. (DNCP)
- *Lower Fulton-Van Ness Historic District.* Boundaries: Voorman St., Belmont Ave., Wishon Ave., Yosemite St., College Ave.

Based on their age, integrity, and historical/architectural significance, properties individually listed on the State and National Registers, as well as the Fresno Register of Historic Resources, including contributing elements of designated and proposed historic districts, should generally be assumed to possess a moderate to high potential for the presence of subsurface archaeological deposits.

Field Investigations

A program of limited archaeological field investigations was devised that would focus upon a cross-section of parcel types that had been identified in the course of archival, aerial photography, and historical map review as possessing moderate to high sensitivity for the presence of cultural deposits. An aspect of the field investigations was to test the correlation between features depicted on the historical maps versus what was actually visible on the ground surface. A total of 18 representative parcels located within both the FCSP and DNCP area were selected for pedestrian surface survey. Selection was based in part on accessibility. The parcels ranged in size from full city blocks to several lots.

The parcels selected were predominantly located within the Downtown area, or within Downtown adjacent subareas of the DNCP. There are several reasons for this distribution pattern. First, because of past urban renewal activities and other forces, Downtown and adjacent areas contain the highest number of historically developed parcels that are now vacant and accessible. Further, the outlying portions of the DNCP tend to be predominantly residential in nature, more recently developed, more intact, more poorly documented by the historical maps, and generally less accessible for survey.

Following a preliminary reconnaissance, the surface survey was performed by Greenwood and Associates archaeologists Dana Slawson, M.Arch., and Michael Kay, M.A., on June 27 and 28, 2011. The standard method of walking parallel transects spaced no more than five meters apart was employed. All exposed surface soils were thoroughly inspected for indications of cultural resources, including fortuitous exposures such as landscaped, graded, or cleared areas, and areas of rodent disturbance. The results of the field investigations are presented in Section 2.4.

Native American Consultation

The Native American Heritage Commission (NAHC) in Sacramento was contacted by letter informing them of the proposed Fulton Corridor Specific Plan/Downtown Neighborhoods Community Plan projects and requesting a review of the NAHC Sacred Lands file for information on traditional or cultural lands present within the project area and vicinity. A listing of representatives of local Native American groups that may have an interest in the project area was also requested.

On April 22, 2011, the NAHC responded with a list of tribes requesting consultation (see Appendix A). Each of the 16 tribal representatives on the listing was subsequently contacted by letter and provided with a description of the proposed undertaking and maps identifying its location. Comments were solicited regarding the undertaking and any information that pertains

to cultural resources, sacred lands, or traditional cultural properties in the area. An example letter as well as the distribution list and Native American responses are included in Appendix A.

Subsequently, the City of Fresno Planning and Development Department independently initiated consultation via telephone with each of the identified tribal groups as part of its government-to-government consultation responsibilities under State Bill 18. Representatives of all 16 tribal groups were contacted between December 22, 2011 and January 12, 2012.

2.2 Background

2.2.1 Physical Environment

Fresno is located in Fresno County, roughly half-way between Los Angeles and San Francisco, in California's San Joaquin Valley region. Fresno County is bounded by two rivers, the San Joaquin River and the Kings River. The City of Fresno is located in the north-central area of Fresno County. The combined Fresno Fulton Corridor Specific Plan and Downtown Neighborhoods Community Plan project area encompasses approximately 7,290 acres of urban land, comprising most of the city's historic core. The project area is depicted on portions of the USGS Fresno North, Fresno South, Clovis, and Malaga, CA 7.5' Quadrangle maps (Figure 2-1).

Prior to historical development, the general area of present-day downtown Fresno was known as the "Sinks of Dry Creek," a low-lying semi-arid grassland. The nearest perennial waterway, the San Joaquin River, flows five miles to the north of the project limits. Currently, the FCSP/DNCP project area manifests a densely built-up urban environment incorporating a broad spectrum of uses and neighborhood types, with residential, commercial, municipal/ governmental, and industrial development being best represented.

The Fresno area was once covered with native annual and perennial grasses such as needlegrass (*Stipa* spp.), bluegrass (*Poa* spp.), and three awn (*Aristida divaricata*) commonly found in the Valley Grassland Community (Munz and Keck 1973). Over the past 150 years, farming and ranching activities have severely compromised the natural vegetation of the San Joaquin Valley and introduced species are now dominant. Faunal populations have been impacted by Euro-American settlement as well. Prior to colonization, the valley floor was occupied by diverse resident and migratory mammals, birds, and fish. Historical and modern land use has greatly reduced the size and number of native habitats, and decimated numerous indigenous species. Most commonly found in the project area vicinity today are jackrabbits, ground squirrels, field mice, snakes, and frogs, along with birds such as jays, mourning doves, crows, and red-tailed hawks.

The San Joaquin Valley lies within the Mediterranean climate zone typified by hot, dry summers and cool, wet winters. Temperatures range from highs of 90-100° F in the summer months to lows of 40-50° F in the winter, although temperatures exceeding 100° F in the summer and dropping below freezing in the winter are not uncommon (Weir 1956). Annual precipitation averages 10 inches per year, with most of the rain falling between October and March.

The natural topography of the project area is generally flat, ranging from approximately 275 feet above mean sea level (amsl) at the southwest boundary of the Downtown Neighborhoods project area along Church Avenue, to 310 feet amsl along the eastern project area boundary at Chestnut Avenue.

Residential development occurs throughout the project area, but is concentrated in the eastern and western sections of the Downtown Neighborhoods project area. Single family residences

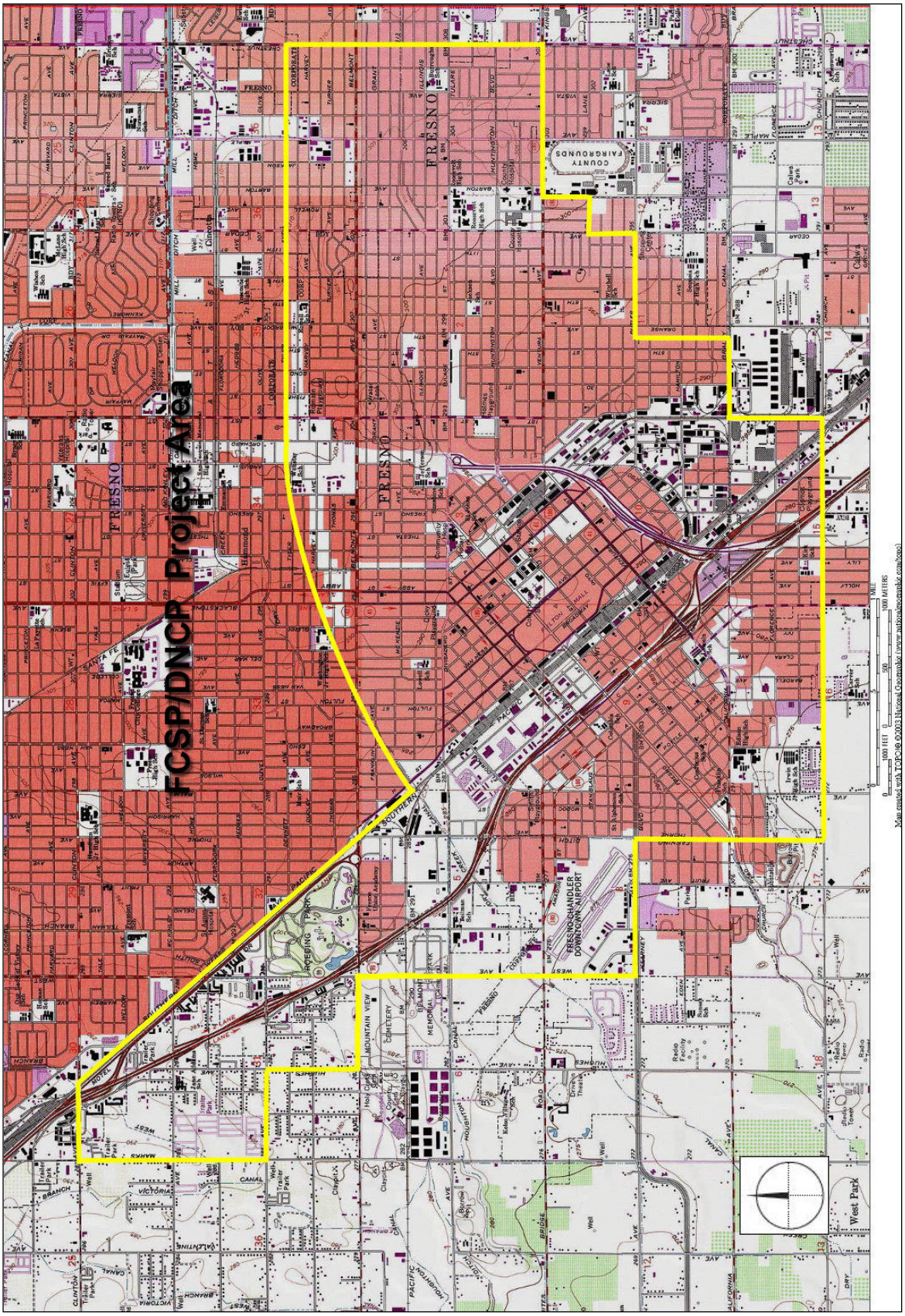


Figure 2-1. Combined FCSP/DNCP indicated on USGS Fresno North, Fresno South, Clovis, and Malaga, CA, 7.5' topographic maps.

dominate and, while a number of nineteenth century dwellings survive, development of the majority of residential structures dates to the era between World War I and the 1950s. Later residential development is more common in the peripheral sections of the DNCP area.

Commercial uses are primarily concentrated within the Fulton Corridor portion of the project area, but commercial strip development extends through the DNCP area along the Ventura Avenue, Blackstone Avenue, and Belmont Avenue corridors, among others. The established Central Business District of Fresno is defined by the City as the area bounded by Inyo Street on the southeast, the Union Pacific railroad tracks on the southwest, Tuolumne Street on the northwest, and N Street on the east. This area is developed with commercial and office functions, and also takes in the County government offices. The Fulton Mall forms the primary (pedestrian) commercial axis within downtown, and Van Ness, Tulare, and Fresno are the principal vehicular commercial streets, incorporating many different types of retail establishments and services.

Industrial development is most heavily concentrated in the south-central and north central sections of the Downtown Neighborhoods Community Plan project area, particularly in those sections bordering the railroad corridor alignments southeast of Highway 41, and north of Highway 180, between the railroad corridor and Highway 99.

While there are several small parks, playgrounds, and public open spaces scattered throughout the project area, the most significant open area is Roeding Park/Fresno Chaffee Zoo, a 90-acre park located in the northwest section (Jane Addams Neighborhoods subarea) of the DNCP area.

2.2.2 Regional Cultural Setting

The following summary is based on a literature search conducted for the vicinity of the Fresno Fulton Corridor Specific Plan and the Downtown Neighborhoods Community Plan project area. It is intended both to indicate the potential for the presence of cultural resources within the project area, and to provide a context for any cultural data that may be present within the project area.

Prehistoric Cultural Setting

Numerous archaeological investigations have been conducted in the San Joaquin Valley; some of the most important work has been undertaken in the area of the Buena Vista and Tulare Lakes. These investigations reveal a complex prehistory of cultural groups that occupied this region. Through the study of their artifacts, archaeologists have come to form numerous chronologies that collectively offer a framework for interpreting the prehistory of the San Joaquin Valley.

In 1939, Gorden Hewes conducted a survey of 107 archaeological sites, mostly along the waterways of the east side of the San Joaquin Valley. One site in particular, Fre-48, showed significant density and diversity of artifacts that reflected a long history of human activity (Hewes 1941; Moratto 1984:185-186). Adding to Hewes' discoveries, Waldo Rudolph Wedel (1941) produced the results of archaeological excavations conducted at five sites on the southwestern end of Buena Vista Lake. Among these, two midden sites (Ker-39 and Ker-60) revealed hearths, milling stones, and manos. In addition, caliche-encrusted burials, flexed burials, post molds, bone, shell, clay, and stone artifacts were recorded at Ker-60 (Wedel 1941:136; Moratto 1984:186). From the artifacts observed at Buena Vista Lake, Wedel suggested a relationship between this area and the Oak Grove sites on the Santa Barbara Coast, as well as Early

Horizon sites of the San Joaquin Delta to the north. The latter, Wedel argued, seemed much more developed, based on the lack of stone or shell ornaments at Buena Vista Lake. The observation of patterns in stratigraphy led Wedel to suggest further that there were strong connections between the Southern San Joaquin people and cultural groups in southern California (Wedel 1941:147; Moratto 1984:186).

After investigating burials at Tul-90, a site near the edge of Tulare Lake, Claude Warren and Marshall McKusick (1959) conducted a review of past archaeological studies in the San Joaquin Valley and proposed a chronology for the area based on burial traditions (Warren and McKusick 1959:20; Moratto 1984:189). Their suggested sequence and observed burial patterns are as follows:

Early: Unknown date to 2,000 B.C. Burial position is generally extended, supine or prone. There are no burial goods.
Middle: 1500 B.C. to A.D. 500. Burial position is generally supine and semi-flexed. There are a few burial goods.
Late: A.D. 500 to ethnographic present. Burial position is generally flexed on the side or supine. There are moderate amounts of burial goods. Post Contact burials are often associated with European goods.

Later archaeological studies provided wider and refined chronologies. David Frederickson's excavations at Ker-116 (1964) revealed a deeper stratum that suggested a broader temporal past. This, and Leslie Hartzell's radiocarbon dates derived from excavations in the Buena Vista Lake basin (1992), allowed Hartzell to devise the following chronology:

Early Holocene Occupation:	8,000 B.P.
Mid-Holocene Occupation:	7,000 B.P. to 4,000 B.P.
Late Holocene Occupation (1):	4,000 B.P. to 2,000 B.P.
Late Holocene Occupation (2):	2,000 B.P. to 1,000 B.P.
Late Holocene Occupation (3):	1,000 B.P. to ethnohistoric present

Similarly, Leach-Palm et al. (2006) suggested this refined chronology:

Paleoindian Period:	~12,000 B.P. to 10,000 B.P.
Milling Stone/Late Archaic Period:	10,000 B.P. to 5,500 B.P.
Early Period:	5,500 B.P. to 2,600 B.P.
Middle Period:	2,600 B.P. to 1,000 B.P.
Middle-Late Transitional Period:	1,000 B.P. to 750 B.P.
Late Period:	750 B.P. to ethnohistoric present

Despite variation in dates among these chronologies, general patterns in material culture can be described within the wider frame of a three-phase, Early-Middle-Late periods chronology.

Early Period (~12,000 B.P. to 8,000 B.P.)

The material culture of the Early Period is characterized by large, fluted projectile points that imply heavy reliance on large game for subsistence, probably supplemented with smaller game and collected plant foods. Few sites from this period have been discovered, and substantial evidence comes mostly from the former shores of Tulare Lake, especially at the Witt Site in southern Kings County. Artifacts are represented in the form of Clovis-like projectile points made from chert, similar to other Pleistocene period sites in North America, as well as various scrapers, chipped crescents, and other stone tools associated with the Fluted-Point and/or

Western Pluvial Lakes Traditions. Horse, bison, ground sloth, and human bones were also found at the Witt Site, along with the tusk of mammoth or mastodon (Moratto 1984:81-82). These bones have been radiocarbon-dated to about 11,000 to 13,000 B.P.

Middle Period (8,000 B.P. to 2,500 B.P.)

An examination of lithic tools from the Early and Middle Periods shows little difference between the two. Stone tools from the Middle Period, in fact, look very similar to the Western Pluvial Lakes Tradition associated with the Great Basin. The Middle Period, however, is associated with an increase of groundstone tools, such as metates and manos, reflecting an increased dependence on vegetative species requiring processing, such as seeds and nuts. Lithic technology, for the most part, remains relatively unchanged (Hatoff et al. 2005:8).

Late Period (2,500 B.P. to Ethnohistoric Present)

During the Late Period, patterns in material culture experienced dramatic change, much of which was observed and recorded, but simultaneously caused, by Europeans during the later part of the period. The Late Period also marked the increase of diversity in material culture. Both the *Olivella* shell bead and bow-and-arrow technology made their first appearances in the area. People buried their dead in a flex position much more frequently, and burial goods were numerous compared to previous periods. Occupation sites were larger, reflecting semi-sedentism, and there was great reliance on groundstone, particularly mortars and pestles, indicative of increased dependence on nuts, seeds, and acorns. Mortars and pestles during this period were much more finely produced compared to the Middle Period. Objects such as bird-bone whistles, steatite pipes, very small serrated projectile points, obsidian from eastern California, and rectangular *Olivella* beads appeared for the first time (Leach-Palm et al. 2006:23; Hatoff et al. 2005:8-9).

Assessing the region's prehistoric settlement patterns has been problematic, since most of the excavations done in the San Joaquin Valley have been restricted to later-period Yokut burial sites. Larger scale projects have been limited to Buena Vista Lake and San Luis, Los Banos, and Little Panoche reservoirs. Wallace has stated that this area "remains one of the least-known archaeological areas in California" (1978:215). Nonetheless, evidence points to the likelihood that most occupations were on or near now-extinct lake shorelines to maintain resources, with interruptions related to dry climatic intervals, particularly A.D. 1000 to A.D. 1500. After A.D. 1500, most populations settled in the southern and western parts of the San Joaquin Valley (Wallace 1978:215).

Ethnography

Fresno is located in the San Joaquin Valley on land once inhabited by the Northern Valley Yokuts, very near their territorial boundary with the Southern Valley Yokuts. They occupied an area that extended to the Sacramento River Delta on the north, the crest of the Diablo Range to the west, and the lower foothills of the Sierra Nevada to the east. Their disappearance was brought about by disease and dislocation due to aggressive missionization during the late 1700s and early 1800s, the Gold Rush of the 1840s and 1850s, and American expansion thereafter. The little that is known of them today is based mostly on the accounts of non-Native explorers and missionaries (Wallace 1978:462).

The Northern Valley Yokuts subsisted primarily on resources present along the San Joaquin River and its associated channels. The vegetation was sparse in the valley, aside from marsh grass and tules, and trees were limited to small patches of sycamores, cottonwoods, and

willows. Tule roots and seeds found throughout the valley served as important food staples. In addition, valley oaks could be found in groves in areas of great water abundance and nutrient-rich soil. Acorns from these oaks formed an important dietary staple, and were ground into a powder using a mortar and pestle, and subsequently leached of toxins in waterways. The leftover resulting paste was then cooked and consumed. Fauna was abundant in the riverine areas, and fish, freshwater molluscs, turtles, and waterfowl were important food sources. Tule elk, pronghorn antelope, jackrabbit, squirrels, reptiles, and a variety of birds were also consumed (Wallace 1978:462-464).

The Northern Valley Yokuts lived in semi-autonomous patrilineal villages that were led by a headman and typically averaged around 300 persons. They spoke various dialects of the Penutian language stock. The Yokuts' dwellings were small, round structures formed of light wooden poles covered with woven tule mats. Villages often included a lodge for community functions, as well as a sweathouse. The local village economy involved the production of baskets and mats made of tule stalks, stone mortars and pestles, projectile points and stone tools made from local chert, jasper, chalcedony, and imported obsidian, and bone tools such as the awl. Ceramic production was likely not emphasized and secondary to other goods (Wallace 1978:464-465).

Trade was active with neighboring groups, as the Northern Valley Yokuts transported goods on watercraft made of tule along the San Joaquin River and its tributaries. Overland trails to the territory of the Salinan and Costanoan tribes on the Central California coast were also maintained. Domesticated dogs were given to the Miwok in exchange for baskets, bows, and arrows, and the Costanoans supplied the Yokuts with mussels and abalone shells (Wallace 1978:465).

Villages were settled primarily on the top of low mounds and near large sources of water, where they were somewhat protected from springtime flooding as snow melted from the Sierra Mountains. Their close proximity to water sources helped foster sedentary lifestyles and long-term occupation of the villages. Occasionally, flooding and food shortages forced the inhabitants to move their village to another site until conditions improved. When food shortages were less severe, able-bodied individuals went out to collect wild plants and seeds as their elders stayed behind (Wallace 1978:466).

The population of the Northern Valley Yokuts dramatically declined after European contact. Contact with Spanish explorers and missionaries during the Spanish-Mexican period (1769-1846) brought on disease, erosion of traditional native culture, and displacement of natives from their lands. Remaining populations were eventually incorporated into the Mission system, which further continued the devastation of the native cultures. Some Yokuts escaped the mission system and became fugitives at risk of being captured or killed. Even with the transfer of land from Spain following Mexican Independence in 1822, native populations were pushed into marginal parts of the land, and food became scarce. Relationships between native groups and encroaching ranchers became even more strained as natives began stealing livestock and horses in desperation. The incorporation of California as a State in 1846 and the California Gold Rush of 1849 only hastened the decline of Native American culture. The remaining Yokuts were pushed from their lands, usually in the face of violent opposition from white settlers, who eventually took some of the Indians for laborers on ranches and farms. By the time the United States government set aside land in the Fresno and Tule River Reserve, the Yokuts and other native peoples had nearly disappeared. Few descendants of Northern Valley Yokuts survive today (Wallace 1978:468-469).

2.2.3 Historical Setting

The following historic context statement provides a brief overview of the history of Fresno and the FCSP and DNCP areas. This context describes the early development of the area and identifies important historic themes that may have influenced that development and the construction of the historic resources within the Survey Area.

Early Exploration and Settlement

The nineteenth century opened with a wave of exploration into the San Joaquin Valley that eventually led to the settlement of Fresno County. Members of an 1806 expedition led by Spanish explorer Lt. Gabriel Moraga were perhaps the first Europeans to pass through present-day Fresno County. Between 1806 and 1813, Moraga guided several additional expeditions during which he discovered and named the county's two major waterway, the San Joaquin and Kings Rivers. However, Moraga's search for potential new mission sites ultimately proved fruitless and the region remained well beyond the administrative reach of the established missions. Others soon followed Moraga, including the explorer and mountain man Jedediah Strong Smith, who in 1826 was the first American to arrive in California overland; Peter Skene Ogden, leader of Hudson Bay Company trapping operations in California; and John C. Fremont, who led an 1845 expeditionary force through what would become Fresno County (Fisher 1994:3).

Despite these early forays, the valley's inhospitable environment deterred permanent settlement. With the onset of the Mexican War in 1846, Central California came under the control of the United States. However, it wasn't until the discovery of gold in California that miners and other settlers were ultimately drawn to the region in search of riches. In the early 1850s, minor quantities of gold were discovered along the San Joaquin and Kings Rivers and their tributaries in the Sierra foothills and the resulting gold camps and mining districts became part of the southernmost Mother Lode gold region. The county's first substantial settlements rose in the foothills; foremost among them was Millerton. When Fresno County was created from portions of Mariposa, Merced, and Tulare counties in 1856, Millerton served as the first governmental seat. It remained the county seat until 1874 when it was moved to the rising, and more centrally located, city of Fresno (Brady 1985:6). By the early 1850s, many miners had begun to explore the possibility of farming as a livelihood. In the 1850s through the early 1870s, cattle and sheep grazing and dry-farming of grains, along with mining, represented the major economic activities of Fresno County (Fisher 1994:4).

The low-lying area now occupied by downtown Fresno was once known as the "Sinks of Dry Creek." Near the Sinks of Dry Creek, rancher Anthony Easterby purchased 5,000 acres of land bounded by what are now Chestnut, Belmont, Clovis, and California Avenues in 1867. Easterby and neighboring rancher, Moses J. Church, were convinced that, with irrigation, the parched soil of Fresno County was fertile enough to support crops. They conceived an irrigation system that would convey water from the Sierras to the Fresno plain. In 1871, Easterby hired Church to complete the county's first canals, known as "Church's Ditches." Easterby's bountiful crop of wheat that year laid to rest most doubts about the county's agricultural potential (Fisher 1994; Clough et al. 1986:139; Vandor 1919:9-21).

Cognizant of Easterby's success and recognizing the area's potential for commercial agriculture, the Central Pacific Railroad selected a site near the Easterby ranch for a depot location as it charted the path of its new "Southern Pacific" rail line through the San Joaquin Valley in 1871. The line would become the first to connect northern and southern California. The Contract and Finance Company, real estate arm of the Central Pacific, soon acquired 4,480 acres around the depot site with the intention of developing an agricultural center. A street grid

oriented parallel to the northwest-southeast running tracks was platted and land donated for the new community's courthouse (Clough and Secrest 1984:121; Easton 1965). The name selected for the depot and new town was Fresno. "Fresno" is derived from the Spanish word for ash tree. Numerous regional features were so named by early Spanish explorers who found many such trees growing along the waterways in the otherwise desolate region (Gudde 1969:115).

Early Development of Fresno

Fresno, or "Fresno Station" as it was first known, began to rise even before the Central Pacific's tracks had been laid. The town site was surveyed and divided into "302- by 400-foot blocks, with 25- by 150-foot lots and twenty-foot alleys" (Clough and Secrest 1984:121; Easton 1965). The rail alignment bisected the street grid and Silvia Avenue (present-day Divisadero Street) formed the northern boundary. The Court House and Civic Center were centrally located and took up four city blocks. The streets running northwest to southeast were given letter names, while the southwest to northeast running avenues were named for California counties. The asking price of individual lots ranged from $60 to $250 depending on their proximity to the civic center and the railroad tracks. Due in part to the new town's isolated location in a desert region of the San Joaquin Valley, there were few buyers initially. The railroad resorted to allowing the first new settlers to take up residence on selected land and pay later if they decided to remain on it. The incentive proved effective; the town grew and land values rose quickly.

Historian W. W. Elliott noted that Fresno's first settler was A. J. Massen who, being an enterprising individual and observing the growing demand for water, erected the first "public water works" – a well and a watering trough in front of his dwelling (Elliott 1882). Following Massen's lead, Schultz and Roemen opened a saloon; the Larquier Brothers established the French Hotel; Russell Fleming began a livery stable; and in August, 1872, the town's first post office was established. In the spring of 1872, the railroad tracks to Fresno were completed, connecting it with the outside world. By 1874, the town boasted 55 buildings, including "four general stores, two fruit stores, one drugstore, three hotels, two restaurants, six saloons, two law offices, two physicians, one tinsmith, one saddle shop, two butcher shops, three blacksmiths, one tailor, the *Expositor* (newspaper), and twenty-five private residences" (Clough and Secrest 1984:122). In 1875 the first brick building in town was constructed on Mariposa Street by Otto Froelich (Vandor 1919:252).

The first commercial district emerged along Front Street (present day H Street) and the railroad tracks at the heart of the area that is now referred to as the Central Area or Central Business District. The original train station was located on H Street at Tulare. It was replaced in 1889 with a larger station located on the same site. Largely because of its position on the new railroad line, Fresno quickly grew in population and stature. County residents called for a change in the county seat from Millerton to Fresno, and this was accomplished with a special election on March 23, 1874.

In 1873, Fresno's prospects were further elevated when horticulturalist Francis T. Eisen discovered that Fresno's soil was ideally suited to viticulture. In 1875, he produced the area's first wine and in 1877 processed the first Fresno raisins. As a result of his experiments, the county would become world renown for its Muscatel, Angelica, Tokay, Claret, Riesling and Sauterne grapes and raisins. Peaches, nectarines, apricots, figs, and almonds also thrived and the city of Fresno eventually grew to become the San Joaquin Valley's leading agricultural center. While the city's position on the railroad was a key factor in this achievement, the reaping of significant profits from vineyard and orchard cultivation was intrinsically linked to the ability to bring water to the Fresno Plains. In this regard, the agricultural colony system would play a major role (Elliott 1882: 87; Vandor 1919)

By the early 1870s, when farming was gaining importance in the region, speculators viewed the Fresno Plains as an untapped source of potential profits and began to devise a systematic approach to marketing vast acres of what was essentially barren and arid land. In 1875 the Central California Colony was created south of Fresno, establishing the paradigm for a system of development that was used throughout the San Joaquin Valley. Investors purchased large tracts of land cheaply, which they then subdivided into 20-40 acre parcels and marketed to small-scale farmers (Figure 2-2). To enhance the appeal of their offerings, the stakeholders typically built irrigation canal systems and roads – often attractively landscaped with rows of palms, eucalyptus, or other trees – which improved the colony's appearance while also aiding agricultural production and shipping. Although the first colonies were established in 1875 and 1878, the major period of colonization in Fresno County was the 1880s. The colonies ranged from undertakings that were communal in nature, ideological and altruistic, to pure business arrangements. Advertisements and marketing pamphlets made their way around the world and farmers and their families drawn from Scandinavia, other parts of Europe, Asia, and from across the United States contributed to Fresno's steady rise. By 1903 there were 48 separate agricultural colonies in Fresno County (Panter 1994; Thickens 1946:17).

Figure 2-2. 20-acre Fresno area colony farm, ca. 1880. (Source: Fresno County Library)

Late Nineteenth Century Growth

The agricultural richness of the surrounding region fueled Fresno's growth and importance as a shipping hub. Incorporated as a city in 1885, Fresno experienced rapid expansion of its urban core during the last two decades of the nineteenth century. From 1880 to 1885 the population more than tripled from 1,112 to 3,464 inhabitants, and by 1900 it had bounded to 12,470. Lands surrounding the original town site boundaries were quickly snapped up by speculators and subdivided as a result (Clough and Secrest 1984:122).

The first major expansion of Fresno's street grid occurred in 1880, when the Villa Homestead Tract was added to the northeast of the original town site. This addition and all subsequent ones were laid out aligned with the cardinal directions rather than oriented to the Central Pacific's tracks, resulting in the many oddly shaped parcels and skewed intersections that today demark the boundaries of the city's historic core. Subdivisions within what is now the Fulton-Lowell subarea developed beginning in 1884. Chief among the next waves of development were North Park, and West Fresno. In 1910, the Alta Vista Tract, bounded by Balch, Cedar, and Platt Avenues, and First Street was added east of the downtown (GPA 2008).

Fresno has a history of strong immigrant communities. Many of the immigrants that were first attracted to Fresno were ethnic minorities, who settled over time in neighborhoods such as Chinatown, Armenian Town, Germantown, and Italian Town.

Underlying every incentive for immigration was the remarkable agricultural development of the plains which, once stimulated by the colony settlements, attracted even more people from abroad. In 1878, the Scandinavian Colony was established several miles northeast of Fresno city. Its settlers were mostly Danish, but also included Swedes and Norwegians, lured by a well-organized international marketing campaign that emphasized Fresno's farming opportunities. Evidence suggests that many of the Scandinavians, after adjusting to their new homeland in an established colony branched out to start settlements elsewhere. The Whites Bridge Road area of West Fresno was one of the places in which numerous Danes settled in the 1880s and 1890s, as underscored by the names in the area such as Teilman Ditch and Nielsen Avenue. There, they planted land in vines and trees and successfully harvested raisins, vegetables and berries (Fisher 1994).

Sanborn insurance maps recorded land use in Fresno from the beginning of 1885. The earliest maps depict scattered development throughout an approximately six-block radius of the Southern Pacific Railroad depot, which was located along H Street between Mariposa and Tulare Streets. Mariposa Street had emerged as the principal commercial thoroughfare, and the 1885 maps illustrate fully built out blocks of brick and wood frame row buildings housing shops, lodging houses, banks, offices, restaurants, and saloons beginning at H Street near the train depot and extending to the northeastward for three full blocks to K Street (Van Ness). Additional commercial row development along H Street faced the train station (Figure 2-3). Residential development in early Fresno was concentrated in the area between Mariposa and Merced Streets, and between Tulare and Inyo Streets to the southeast.

Figure 2-3. H Street, looking north from Tulare Street, 1884. (Source: Fresno County Library)

As might be expected, the town's early industry was predominantly oriented to agriculture. Among the more prominent enterprises were Moses Church's Champion Flour Mill at the corner of N and Fresno Streets, J.W. Williams and B.L. Smith's wagon shop near the corner of K and Fresno Streets, Kutner & Goldstein's Grain & Agricultural Implements Warehouse and M.J. Donohoo's Lumber Yard, both situated along the railroad tracks, the Fresno Fruit Packing Company at the corner of G and Mono Streets, and the Fresno Agricultural Works at the corner

of L and Tulare Streets. A 12 foot wide irrigation canal ran through the center of town along Fresno Street.

Fresno's historic 'Chinatown' was also well established by 1885, located immediately southwest of the Southern Pacific tracks. By the 1890s, there was a substantial Japanese population in this area as well.

Fresno's economy was flourishing in 1887 and real estate transactions during that year reflected the impact of the statewide boom of the late 1880s. During the month of April alone, the county recorder reported 375 deed transactions totaling in excess of one million dollars. Relatively inexpensive land prices continued to draw new settlers to the area and played a role in the ongoing economic prosperity. The last 70 original Central Pacific town site holdings were purchased by Jefferson Guy Rhodes in August 1887, and by November over 1,100 deeds had been filed with the Fresno County Recorder. Land sales began to move beyond the city limits, especially to the north and east, and there was expansion of both the residential and commercial areas of the city (Vandor 1919: 359-366).

By 1888, additional residential development had occurred north of Merced Street along Tuolumne, Stanislaus, Calaveras, H, I, J, and K Streets. At that time, dwellings had also gone up along Tulare, Kern, Inyo, Mono, and Ventura Streets, and H, I, J, K, L, M, and N Streets, east of Mariposa Street. Between 1887 and 1890, the Fresno Water Company integrated and substantially expanded the town's loose patchwork of water supply infrastructure, building Fresno's first pumping station and water tower, and laying out 4-inch wrought iron water mains. Some of these original "permanent pipes" are still in use (City of Fresno 2012).

The community's growth and prosperity persisted through the end of the decade and commercial building within the business district went on unabated. In 1889, there was nearly one million dollars worth of new construction along Mariposa Street alone (Figure 2-4). The *Fresno Morning Republican* noted that it was hard for any business to fail during this period (Clough and Secrest 1984). By 1890, the city population was estimated at just under 11,000 (Brady 2003:7).

Figure 2-4. Mariposa Street, ca. 1890. (Source: Fresno County Library.)

As the downtown area filled out during the late 1880s, both commercial and residential buildings could be found along K Street (later Van Ness), between Tulare and Inyo streets. More outlying residential areas, such as those along O Street, were still in relatively rural settings. With land within the city limits bringing premium prices, the City began to annex additional property for commercial and residential development. In 1887, the City annexed the first addition, the

Woodward Addition, which was located at the southern end of the community; however, the greatest growth during this period was directed to the north and west of the city limits. Higher land prices and the demand for new housing brought numerous land speculators and established farm owners alike to subdivided their land in the outlying areas into housing tracts (Brady 2003:7; Vandor 1919:361).

The Lowell neighborhood developed north of Divisadero Street during Fresno's rapid growth period, from the mid 1880s through 1910. Demographically, the area was somewhat unique, in that upper, middle, and working class families all resided within it. Working class enclaves developed bordering the more affluent areas of the Lowell neighborhood. Contrary to the social and economic segregation typical of many parts of the country, Fresno saw affluent families residing only one street away from working class enclaves (GPA 2008).

The land in the western portion of the study area, west of the original town site of Fresno began to be developed in the 1880s. The Western Addition of Fresno was subdivided in February, 1882. The Western Addition included lands extending from Belmont Avenue on the north to Whites Bridge Road on the south, and west from Tehama Street to Thorne Avenue. In 1888, the West Fresno Addition was annexed, and in the ensuing years, more tracts were developed, marketed, and eventually annexed to the city of Fresno (Fisher 1994:5-6).

When the dry white wine produced from the area's vineyards proved less than satisfactory, the grapes were cultivated for raisins, which were naturally produced by the continuous sunlight in the valley. Following an unusually large yield of more than one million pounds of raisins that drove the price down to two cents a pound in 1894, the Raisin Growers Association was organized in 1898 to protect the industry. In 1886, Frank Roeding and his son began growing figs in the area, spawning another successful industry.

By 1900 the population of Fresno had reached 12,470 people, and the city drafted its first charter. During the following decade agriculture continued to flourish, with cotton growing and sweet wine production emerging as new industries. Fresno became the residential and commercial center of an increasingly prosperous region. With the expansion of manufacturing along with agriculture, Fresno was by the end of World War II a major metropolitan area (Fisher 1994:5-6).

Key to Fresno's further outward expansion was the introduction of street car and trolley lines which carried passengers to different parts of the City and attracted business to the area. In 1889, the Fresno Street Railroad franchise first introduced service. Other franchises followed, carrying passengers in horse- and mule-drawn, mostly antiquated, second-hand trolley cars from San Francisco.

In 1903, the Fresno Traction Company introduced Fresno's first electric streetcar line, and in 1909 the city's first double track line was installed on J Street (now Fulton Street). The Fresno Traction Company operated an interurban line north of Fresno to the new State Normal School and beyond to the banks of the San Joaquin River by 1915. Promotional material produced in 1909 by the Fresno County Chamber of Commerce advertised Fresno as the largest city in Fresno County with a population of 30,000 and one of the most important cities in the State (Hamm 1979).

During the peak years of streetcar travel – between 1902 and 1929 – trolleys and street cars carried tens of thousands of riders along almost 200 miles of track. By the end of the 1920s, automobiles began to compete with trolleys for space and ridership. Accordingly, streetcar revenues fell as more and more people chose to drive. In 1939, streetcar service ended as the last two lines were abandoned and National City Lines took over the trolley routes and switched

their service to buses. Fresno continued to expand rapidly after the turn of the century, and between 1913 and 1929, eleven high-rise buildings rose to create a distinct Fresno skyline. The pace of downtown growth slowed during the Great Depression, although several notable Public Works Administration (PWA) buildings and some housing was built (Moule & Polyzoides 2011).

Figure 2-5. Mariposa Street, 1920s. (Source: Fresno County Library)

In the eastern reaches of Fresno, early development was concentrated in the vicinity of the Fresno County Fairgrounds, particularly north of Ventura Avenue. There were fully built-out residential tracts in that area, extending as far east as Chestnut Avenue, by the early 1920s.

Roeding Park, in the northwest portion of the DNCP area, came into being with the donation of 118 acres of land to the city by German immigrant, farmer, and nurseryman Frederick Roeding and wife Marianne between 1903 and 1908. An adjoining 40 acres, present location of the zoo, was acquired by the city in 1924.

Fresno Chaffee Zoo began casually as a collection of unwanted pets and other animals around 1908. It received accreditation as the Roeding Park Zoo in 1929 and continued to expand through the 1970s.

Highway 99, the main north-south route through Fresno and the San Joaquin Valley, had its origins as Route 4 in the 1910s. Built to accommodate the growing number of automobiles, it was among the state's first paved overland routes. It was officially designated US Highway 99 in 1926 and acquired the title "Golden State Highway" in 1927. The early highway followed the present alignment of Golden State Boulevard northwest of the downtown, and prior to World War II, its path north of Roeding Park emerged as an early "motel row," lined with motor courts and tourist camps.

Following World War II, the passage of the G.I. Bill enabled returning veterans to purchase homes and establish businesses, prompting another period of rapid expansion. The Mayfair subdivision, completed in 1947 northeast of the Project Area, included Fresno's first suburban shopping mall and ushered in an era of development at the suburban fringe. Between 1940 and

1950, the City's population grew by 30,000, with much of the growth accommodated in new auto-oriented suburbs. The City government attempted to remedy the decline of the Downtown in the 1960 General Plan.

To implement the General Plan goals, Victor Gruen was commissioned to generate an Urban Renewal Plan for the revitalization of Downtown. The centerpiece of the Gruen Plan was the Fulton Pedestrian Mall, completed in 1964. Six blocks on Fulton Street and three cross-streets were closed to automobile traffic and transformed into wide walkways with public art, fountains, street trees, and seating areas. Meanwhile, in 1957 the California Department of Highways proposed construction of State Routes 99, 41, and 180 to form a freeway loop around downtown, redirecting traffic around the City's core rather than into it. The construction of the freeway loop system ultimately had a devastating impact on Downtown Fresno and its surrounding neighborhoods. Formerly unified neighborhoods were cut in two by freeways without surface crossings. Facilitated by the freeways, the City continued to stretch onto inexpensive land to the north and east, aiding the flight of people and businesses away from the center of the city. By 2009 Fresno had reached a population exceeding 480,000 in an area of 105 square miles (Moule & Polyzoides 2011).

Ethnic Neighborhoods

Successive waves of immigrant groups have settled in and around Fresno's downtown throughout the City's history. Areas southwest of the railroad tracks have been settled by Chinese, Japanese, Italian, German-Russian, and African American populations beginning in last decades of the nineteen century and continuing through World War II. As in many communities of the era, Fresno adopted a policy of racial segregation early in the town's life. In 1874 community members convened a town meeting where it was formally established that White residents would settle east of the railroad tracks, while persons of other races and those considered similarly undesirable would be relegated to the west side of the tracks. Since World War II, the West Fresno community has shifted to predominantly Hispanic and African-American populations.

Historic ethnic neighborhoods within or overlapping the Project Area include Chinatown, located between Highway 99 and the railroad along F Street; Fresno's historic Germantown roughly bounded by California Street, Ventura Street, and G Street; the historic Armenian Town located in the southeastern portion of the Plan Area; and the historic Italian community, located southwest of Downtown, spanning the Plan Area and further southwest beyond Highway 99. Outside of Chinatown, where a small commercial historic district has been identified, only fragments of these historic neighborhoods remain (Moule & Polyzoides 2011).

Germantown

Germantown was principally settled by Russians of German descent who had emigrated from Germany to the Volga River region of Russia in the late eighteenth century. Economic hard times and increasing repression by Russia's czarist government in the late nineteenth century led many members of this group to leave their adoptive land and seek new opportunities abroad. Word of good jobs building the railroads and other abundant opportunities, lured large numbers of the so-called "Volga Germans" to the United States. Although Volga Germans streamed into the US beginning in the mid 1870s, it wasn't until 1887 that a group of settlers arrived in the Fresno area. While their odd attire and curious ways initially caught the attention of Fresno's townsfolk, the Volga Germans quickly gained respect for their industriousness and agricultural acumen. Initially, many of the men worked as laborers and at odd jobs to save money to acquire their own land. When they were eventually able to purchase farms, they put

their long experience on the arid Russian steppes to good use, soon gaining acclaim as the region's foremost viticulturists and horticulturists. The Volga Germans are noted for introducing sunflower seeds, watermelon, and the Turkey Red variety of frost resistant wheat to the San Joaquin Valley.

Many of the early German-Russian settlers in Fresno continued the building traditions and patterns of residential spatial organization of their homeland. Among the characteristics were single story houses with square-shaped plans, hipped roofs, fences incorporating street-facing benches enclosing properties, and detached summer kitchens. Streetscapes in Fresno's Germantown around the turn-of-the-twentieth-century undoubtedly resembled those of a village on the banks of the Volga. Aaron Gallup writes: "…the basic hipped-roof form seemed to have had a special appeal for the Fresno immigrants, being reminiscent of the traditional house types found in their home colonies in Russia" (ARG 2006; Gallop 1991).

Fresno saw a boom in immigration from Russia during the first years of the twentieth century. In 1900, 734 Volga Germans resided in Fresno. By 1908 their population had increased to 3,000, growing to 8,000 by 1920. With the onset of World War I in Europe in 1914, followed by the Russian Revolution, immigration to the United States ceased, effectively ending a three decade long flow from Russia to Fresno.

Beginning with the first arrivals, Volga German settlement was concentrated in "West Fresno," the area southwest of the Southern Pacific tracks. Understood by locals to be the "wrong side of the tracks," West Fresno was also home to substantial populations of immigrants from China, Japan, Armenia, and Italy. Land was relatively inexpensive on the West Side, particularly after the Depression of 1893, but also because of the constant threat of flooding there. While local histories offer somewhat limited insights into the Volga German settlement of Fresno, more concrete clues to the physical expansion of this ethnic community are provided by the detailed Sanborn insurance maps from the era. These often identify business names, which can be revealing, but perhaps more importantly, they also depict the outbuildings on each residential property, often with functions indicated. This is especially significant for the Volga Germans, who are noted for their use of detached backyard "summer kitchen" structures, which were commonly referred to as a "sommerkuche" or "backhaus." These features are distinctive for their mid-lot location (versus rear of lot, where stables and outhouses typically were) and identifiable stovepipes ("S.P."). By 1918, they were frequently labeled as "Kitchen" or "Oven" on the Sanborn maps. The structures are viewed as fairly accurate indicators of Volga German occupation. Italian immigrants who settled north of Germantown built similar structures, however, and that boundary is harder to discern.

Historical Sanborn insurance maps from 1898 depict the West Fresno area that would form the heart of Germantown with scattered residential development. The German Congregational Church had been established on F Street near Los Angeles Street, but commercial enterprises in the neighborhood were virtually nonexistent. By 1906, considerable new settlement had occurred, reflecting the surge in Russian immigration after the turn of the century. The community was focused in the triangular area bounded by the Southern Pacific tracks on the northeast, Ventura Avenue to the northwest, and California Avenue on the south, with an additional pocket of settlement south of California between Lily and Nicholas Avenues. Within this area, most lots had been developed and census records confirm that the neighborhood solidly populated by German families from Russia (Gallup 1991:6).

The 1918 Sanborn map illustrates a firmly established Germantown, its footprint expanded by newly arrived Volga Germans who had migrated directly to Fresno from Russia. Since the turn of the century the community had pushed southward and eastward into areas of former farmland. They dominated an area loosely bounded by the tracks on the northeast, Mono Street

on the northwest, Fig Avenue on the west, Chestnut on the east, and Florence and Church Street to the south (ARG 2006; Gallup 1991:3). Churches of various denominations were numerous within this devout community, but a centralized business district seems never to have emerged; neighborhood needs were met by local "corner stores." Germantown was known throughout the Fresno area for its clean streets, tidy yards, and fastidious care of homes and the overall neighborhood. A former resident of Germantown recalled, "It was one of the cleanest sections of Fresno. Every Saturday, we went out with willow brooms and swept the alleys. We didn't have lawns, just flowers and gardens" (Golston 1980).

The Germantown neighborhood thrived until the late 1940s, when plans for the construction of Highway 99 as part of the state freeway system were developed. Historically, Highway 99 had followed a surface route along Broadway Avenue through downtown Fresno. The new depressed freeway was built along the alignment of D Street, effectively bisecting the Germantown community. Real estate records show a marked rise in sales in the years 1947-48 as many community members moved away from the construction (Gallup 1991). This trend continued, resulting in the gradual demise of the German-Russian ethnic neighborhood. Germantown, once affordable for immigrants due to its relation to the railroad tracks and a propensity for flooding, became affordable for Hispanics and African Americans when freeways tragically dissected the area (ARG 2006).

Chinatown

As early as 1872, Chinese men – Chinese women were largely excluded from immigration – formerly employed as miners, laborers, and in building the railroads, had made their way into the new community of Fresno. There they created a tight-knit settlement on the west side of town, separated from the center of the community by the Southern Pacific tracks and adjacent broad railroad reserve. Although Fresno had only recently been founded, by the mid 1880s, "Chinatown" was already well established. As the Chinese moved out of the gold rush region and their population declined in that part of the state during the 1870s and 1880s, the rapid rise of irrigated agriculture in the San Joaquin Valley brought a steady flow of Chinese migrants into that region in search of work. By 1880, Fresno's Chinese population already numbered 743, and by 1890 that number had more than tripled to 2,736 (Chan 1986:46-47).

Sanborn insurance maps delineated in 1885 did not include Fresno's Chinatown in its entirety, but the portion represented (Mariposa to Kern Streets and F Street to the Southern Pacific Railroad tracks) shows dense development beginning on the southwest side of G Street; immediately beyond the trackside warehouses and storage yards. The commercial heart of early Chinatown was the intersection of Tulare Street and China Alley. China Alley, which was only 20 feet wide and ran north-south mid block between F and G Streets, was a major commercial thoroughfare in its own right. Development along the two block long central portion of the Alley was as dense as along the principal street frontages. Concentrated development radiated from that center-point, particularly along G, F, and Kern Streets. Buildings in early Chinatown were typically very long and narrow row structures – many only 12 feet wide – one-story in height, of inexpensive wood-frame construction and lacking basements.

Among the most common types of businesses represented were small shops, lodging houses, restaurants, gambling halls, and laundries. From its nascence, Chinatown was the center of gambling activity and other vice in Fresno – businesses that wouldn't be tolerated in Fresno proper on the opposite side of the tracks. In addition to gambling parlors, the historic maps depict numerous saloons and dance halls, as well as structures labeled "Chinese Women," generally understood to be a euphemism for brothel.

Block 50, bounded by Tulare, F Street, Mariposa, and G Streets, remained the core of Fresno's Chinatown through the 1880s and beyond (Figure 2-5). Expansion to the west of F Street is apparent on the 1888 Sanborn map, as are intrusions into the railroad reserve east of G Street, where a number of small dwellings and businesses identified as "Chinese Shanties" were present. A large section of the adjacent block to the southeast (Tulare to Kern) had burned and was in the process of being rebuilt.

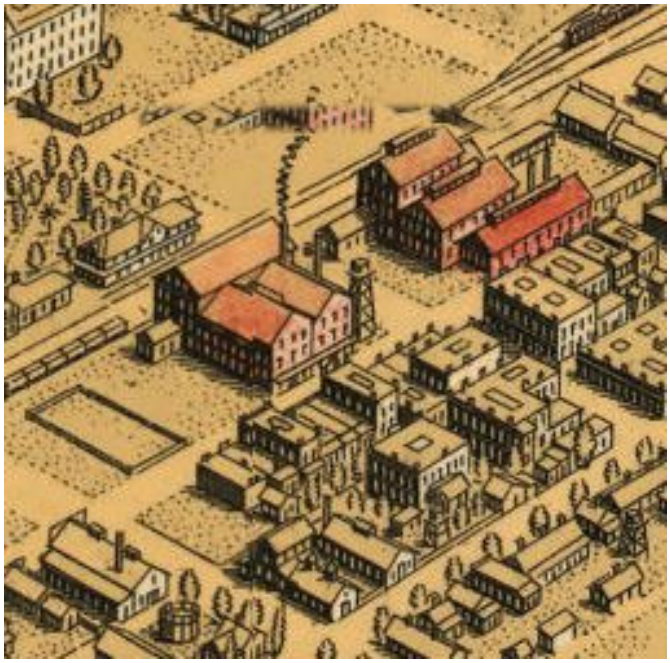


Figure 2-6. 1891 Bird's eye view of Block 50 (center).

The decade of the 1890s saw significant physical changes to the face and extent of Fresno's Chinatown. By 1898, Block 50 had been dramatically rebuilt with narrow brick row buildings, primarily one story and 12 to 25 feet wide, replacing the earlier wooden structures. These fronted on G and F Streets, and also China Alley, which functioned as a full fledged commercial street. Almost all of the new buildings had basements. The eastern half of the block to the southeast of Block 50, bounded by Tulare and Kern Streets, and F and G Streets, had also been densely built out with brick structures, most of which had basements as well. The earlier business uses within the commercial core area persisted, with structures now also identified on historic maps as theaters, joss houses, blacksmiths, bakeries, lottery parlors, and saloons. The decade also saw the increased proliferation of prostitution and related enterprises in Chinatown. Indeed, historic maps of the era illustrate that most of the commercial expansion of Chinatown westward and southward was vice related. Block-long frontages along F and Tulare Streets, as well as sections of E Street, are identified almost exclusively as "F.B." or "Female Boarding" – another euphemism for brothel. The cribs were identifiable by their configuration – long shallow structures along the street edge, typically one room deep, divided into small regular spaces, with the interiors of the blocks left largely open. Few permanent residential structures are indicated in the core area. The limited industrial functions included a gas works, soap factory, and a number of livery stables.

The Chinese Exclusion Act of 1882 had the perhaps unanticipated result of boosting Japanese immigration to the US, and by the 1890s Fresno had a significant Japanese population. The city's unofficial 'zoning' strictures dictated that both ethnic groups confine their settlement to the West Side, and businesses identified as Japanese on the 1898 Sanborn maps were abundant to the south and west of central Chinatown. Japanese lodging houses and brothels existed alongside their Chinese counterparts. On the blocks immediately beyond the three-by-three block core of Chinatown were scattered dwellings, often quite small and labeled as "Cheap" construction, or with the ethnicity of the occupants identified: both Chinese and Japanese.

During the first decades of the twentieth century Fresno's Chinese population prospered and further expanded its territory. Along Kern, Tulare, and F Streets, and Fagan Alley between F and E Streets, new commercial row buildings rose. These were typically two-story brick structures with basements. Labels on the historic maps suggests that the businesses, as well as cultural and entertainment venues, had became considerably more diversified. A number of

theaters and movie houses opened, as did barbershops, photography studios, grocers, and a range of other businesses. Prostitution continued to thrive as well, and several square blocks in the western half of the commercial district were completely devoted to this enterprise. At the corner of E and Kern Streets, a large Japanese Buddhist Temple had been established by 1906, and there were Japanese schools and churches on adjacent blocks. By 1910, the Japanese population in Fresno County had grown to 2,233, most residing in and around Fresno. That number had doubled in size by 1920 to 5,732 residents (http://www.Californiajapantowns .org/fresno.html).

Chinatown remained vibrant into the 1940s. The onset of World War II brought catastrophic upheaval to the Japanese community as residences, businesses, and institutions were shuttered and the population directed to internment camps. Following the war, the construction of Highway 99 in 1948 avoided central Chinatown, but nonetheless had a significant impact on the Chinese and Japanese communities. The new highway's alignment followed the path of D Street and uprooted numerous Chinese and Japanese residents, as well as businesses, religious structures, and schools. The depressed highway physically divided these ethnic communities already wrenched by the recent war and brought about or hastened the departure of many Asian American residents to suburbs well removed from their historic neighborhoods.

The postwar abandonment of Chinatown by its historic occupants coincided with a substantial rise in Fresno's Hispanic population in the World War II and postwar eras. Many were Mexican immigrants who had come in response to labor shortages during the war. Chinatown, this neighborhood that had given a start to members of so many immigrant groups through its history, among them Greeks, Italians, Portuguese, Basques, Armenians, African Americans, and Russians, in addition to Chinese and Japanese, offered the growing Hispanic community inexpensive housing and commercial opportunities. During the 1950s and 1960s the neighborhood increasingly took on a Hispanic character as more and more businesses catering to this ethnic group opened.

Additional freeway construction in the 1960s further isolated Chinatown from surrounding neighborhoods, eroded its fabric, both physical and cultural, and served to accelerate the neighborhood's decline. Renewal plans for the Chinatown area were developed in the early 1960s. Among other things, the plans called for the creation of a pedestrian mall along China Alley. In an oft repeated urban renewal scenario of the era, many of Chinatown's structures were found to be unsafe by building inspectors and demolished (*Fresno Bee* 1962). Further, in 1964 the City council voted to raze a number of buildings on G Street between Tulare and Mariposa because they were vacant and attracted undesirables. The result was the loss of a large number of the oldest structures in Chinatown. Redevelopment plans were revived multiple times in the subsequent decades, but the large scale redevelopment first planned in the 1960s never materialized. The consequence of demolition without reconstruction has been a large number of vacant parcels throughout Chinatown.

In recent years, much has been made of reports of tunnels beneath Fresno's Chinatown. Only limited archaeological research has been undertaken to shed light on these claims, and no historical documentation supporting accounts of any sort of an actual tunnel system has been uncovered. A more reasonable explanation of the "tunnels of Chinatown" legend has to do with the nature of the historic Chinatown community, certain activities conducted there, and the sentiments of the (white and legal) community regarding the population and those activities. The Chinese in Fresno and elsewhere experienced discrimination and hostility. In part to conceal or protect gambling, prostitution and other extralegal activities, but also for legitimate and practical reasons, most buildings in central Chinatown constructed in the 1890s and later included basements. As in most commercial districts, sidewalk vaults, bulkheads, and other

subterranean features were likely common. Rather than an actual system of tunnels, it is more likely that many of the basement spaces in these typically very narrow commercial structures were interconnected. The interconnected spaces would have allowed movement of goods from one space to the next, and could be used to facilitate evasion of authorities in the event of raids on illicit activity as well.

Armenian Town

Armenian settlement in Fresno can be traced to 1881 and the arrival of brothers Hagop and Garabed Seropian. The Seropian's glowing accounts of life in the San Joaquin Valley sent to their home village of Marsovan in the Ottoman Empire drew more immigrants, and by 1894 the Armenian population in Fresno was 360. Their numbers grew rapidly with the onset of the Hamidian Massacres in 1895-1896. Ongoing persecution of the Armenians by the Turks fueled an exodus that commenced even before the start of the Armenian Genocide in 1915; by 1910 the local population had reached about 10,000. Many of the immigrants were Protestant converts, the result of American missionary activity in Armenia. In the years during and after the genocide, additional Armenians came to Fresno, until federal restrictions on immigration in 1921 and 1924 brought this flow to an end. Fresno boasted the largest Armenian community in the state until around 1930, when the depressed agricultural market in the Valley and other factors saw many depart for Los Angeles and other enclaves (Armeniapedia 2011).

The early immigrants were primarily involved with farming and agriculture, first as farm laborers themselves and later as owners of the land and companies which packed and distributed the fruits and vegetables. In 1894 Armenians owned 200 acres of farmland; by 1904 that figure has grown to 10,000 acres. Armenian farmers were particularly known as raisin growers, and by 1902 they produced about 15% of the total crop. By 1906 Armenians owned 16,000 acres of the raisin growing farmland and were also leaders in the packing industry. By 1930 Armenians owned 40% of the raisin acreage in Fresno County. They were pioneers in the melon and fig production as well (Bulbulian 2000:55-57).

Like the members of other ethnic minorities, Armenians arriving in Fresno in the late nineteenth century were relegated by the majority community's unofficial zoning to settlement on the western side of the Southern Pacific tracks. Their area of initial settlement overlapped with the area that would emerge as Germantown, immediately west of the tracks and bounded by California and Ventura Streets. Physically, other than the lack of summer kitchens there is little to differentiate Armenian homes and businesses from those of the Volga Germans on the historic maps. The earliest detailed map of the neighborhood, the 1898 Sanborn insurance map, provides small clues. At that date, the Armenian Library Union Hall stood on the west side of F Street south of Monterey Street. Around the corner on Monterey Street there was a "Turkish Bath," presumably frequented by the Armenian community. The German Congregational Church stood on the adjacent block to the southeast.

The Armenian Apostolic Church congregation erected Holy Trinity Church in 1900 in the vicinity of those earlier establishments, on the corner of F and Monterey Streets. However, by that date the Armenian community was already shifting northeastward, settling the neighborhoods southeast and east of downtown. When the first Armenian Apostolic Church was destroyed by fire in 1913, ground was broken later that year for a new church at the corner of Ventura and M Streets, eight blocks to the northeast. The eastward shift of this focal point of the Armenian community reflects the expansion of the group's domain eastward during the first decades of the twentieth century to the area now considered Armenian Town.

Substantial sections of Armenian Town met the fate of other ethnic neighborhoods in Fresno when construction of the freeways commenced in the late 1940s. Many residing in the western

part of the community were dislodged by the coming of Highway 99 in 1948. Urban renewal efforts of the 1960s also left their mark on the neighborhood. The community was further rocked by construction of Highway 41 in the early 1980s. Today, the heart of Armenia Town is considered the four square block area surrounding Holy Trinity Church, bounded by M Street, O Street, Ventura Avenue and Highway 41.

2.3 Records Search Results

2.3.1 Archaeological Resources

The records search revealed that 48 previous cultural resource surveys have been conducted within a quarter-mile radius of the combined Fulton Corridor Specific Plan/Downtown Neighborhoods Community Plan project area. These surveys were conducted in preparation for a range of the development projects, including highway and other infrastructure improvement projects, residential developments, commercial and industrial projects, and development of communications towers and related facilities.

To date, there have been no archaeological resources, either prehistoric or historic, recorded within or adjacent to the project limits. The previous surveys are summarized in Table 2.1 below. Survey reports are listed in the References.

Table 2-1. Archaeological Surveys in Vicinity of Plan Areas

Info. Center Call No.	Survey Description	USGS Quad	Author and Date	Results
FR-00135	0.7 mi linear survey (pipeline segment)	Malaga, Fresno S, Fresno N	Woodward-Clyde 1995	No sites found
FR-00151	Supplemental survey for SR 41 constn.	Fresno S	R. Pavlik, Caltrans Dist. 5 1995	No sites found
FR-00257	6.5 mile linear survey for SR 180 highway constn.)	Malaga, Clovis	David Chavez and Assoc. 1990	No sites found
FR-00382	1.5 acre residential survey	Fresno S	G. Gmoser, Caltrans Dist. 6 1990	No sites found
FR-00679	18 acre survey (4 federal courthouse alts.)	Fresno S	C.K. Roper, INFOTEC 1995	No sites found
FR-00754/ FR-00755	approx. 2 sq. block survey (Santa Fe Depot)	Fresno S	T. Van Bueren, Caltrans Dist. 6 1995	No sites found
FR-00924	6.4 acre survey	Fresno S	D. Wren 1982	No sites found
FR-00927	3.75 acre survey	Fresno S	D. Wren 1982	No sites found
FR-01005	0.80 mi linear survey (G St. extension constn.)	Fresno N, Fresno S	D. Wren 1988	No sites found
FR-01231	4.8 mile linear survey (SR 180 highway constn.)	Clovis, Fresno N	K. Nissen, 1994	No sites found
FR-01232	0.5 mile linear survey (SR 180 highway constn.)	Fresno N	F. Lortie, Caltrans Dist. 6 1993	No sites found

Info. Center Call No.	Survey Description	USGS Quad	Author and Date	Results
FR-01233	2.2 mi linear survey (SR 180 highway constn.)	Fresno N, Fresno S, Clovis	J. Aguilar-Luna, Caltrans Dist. 6 1994	No sites found
FR-01604	> 6 acre survey (storm water retention basins)	Fresno S	D. Wren 1999	No sites found
FR-01640	linear survey (SR 99, various locations, lengths not indicated)	Fresno N, Fresno S	J. Binning, Caltrans Dist 6 1999	No sites found
FR-01651	230 mi linear survey (fiber optic line)	Fresno N, Fresno S	W. Nelson, Far Western 2000	No sites found
FR-01686	>1 acre communications tower survey	Malaga	M. Peak, Peak & Assoc. 2000	No sites found
FR-01839	>1 acre survey	Fresno N	no author/date	No sites found
FR-01850	>1 acre communications tower survey	Malaga	L. Billat, EarthTouch 2000	No sites found
FR-01862	>1 acre communications tower survey	Fresno N	E. Derr, R.K. Brown, Brown & Mills, Inc. 2001	No sites found
FR-01933	6.6 acre survey (Elem. School)	Fresno S	J. Brady, Applied Earthworks 2003	No sites found
FR-01935	approx. 2 sq. block survey (Santa Fe Depot)	Fresno S	J. Dougherty, PAR 2001	No sites found (potential for histl. archaeo)
FR-01962	>1 acre communications tower survey	Fresno N	B. Wilkins, H. Moore, ATC Assoc. 2002	No sites found
FR-01974	1.4 acre survey	Fresno S	L. Billat, EarthTouch 2002	No sites found
FR-02002	7.2 mi linear survey (fiber optic line)	Fresno S, Fresno N	R. Mason, R. Shepard, Chambers Group, Inc. 2000	No sites found
FR-02023	>1 acre communications tower survey	Fresno N	C. Losee, Archaeological Resources Technology 2004	No sites found
FR-02026	0.25 mi linear survey	Fresno S	J. Brady, J&R Environmental Services 2004	No sites found
FR-02031	>1 acre communications tower survey	Fresno S	C. Losee, Archaeological Resources Technology 2004	No sites found
FR-02054	3.3 acre survey (new school constn.)	Fresno S	W. Nettles, Applied Earthworks 2004	No sites found
FR-02071	0.5 mi linear survey	Fresno S	J. Brady, J&R Environmental Services 2004	No sites found

Info. Center Call No.	Survey Description	USGS Quad	Author and Date	Results
FR-02105	>1 acre communications tower survey	Fresno S	W.H. Bonner, Michael Brandman Assoc. 2005	No sites found
FR-02106	>1 acre communications tower survey	Fresno S	A.R. Wilding, AquAeTer 2005	No sites found
FR-02107	>1 acre communications tower survey	Fresno S	L. Parker, AquAeTer 2005	No sites found
FR-02140	300 acre survey, residential development	Fresno S	URS Corp. 2005	No sites found
FR-02172	>1 acre communications tower survey	Fresno S	D. Supernowicz , Historic Resource Assoc. 2005	No sites found
FR-02175	300 acre survey, residential development	Fresno S	B. Hatoff, D. Livingstone, M. St. Clair, URS 2005	No sites found
FR-02184	>1 acre communications tower survey	Fresno S	J. Payette, ERM 2005	No sites found
FR-02213	>1 acre communications tower survey	Fresno S	S. Billat, Earth Touch Inc. 2006	No sites found
FR-2221	linear survey, multiple alignments (SR 180 Westside Expswy constn.)	Fresno N	L. Leach-Palm, et al., Far Western 2006	No sites found
FR-02232	1.8 mi linear survey (SR 180 West constn.)	Fresno S	J. Brady, Caltrans Dist. 6 2004	No sites found
FR-02234/ FR-02235	9 linear mi Rte 168 highway survey	Fresno N, Clovis	S. Hack, Woodward-Clyde Assoc. 1992	No sites found
FR-02238	>1 acre communications tower survey	Clovis	W. Bonner, Michael Brandman Assoc. 2006	No sites found
FR-02243	>1 acre communications tower survey	Fresno S	W. Bonner, Michael Brandman Assoc. 2005	No sites found
FR-02287	400 mi utility alignment - archaeological monitoring	Fresn N, Fresno S	SWCA 2006	No sites found
FR-02294	20 acre archaeological survey	Malaga, Fresno S	C. K. Roper, Sierra Valley Cultural Planning 2007	No sites found
FR-02324	>1 acre communications tower survey	Fresno N	L. Billat, Earth Touch 2008	No sites found
FR-02329	>1 acre communications tower survey	Fresno S	W. Bonner, Michael Brandman Assoc. 2010	No sites found
FR-02332	>1 acre communications tower survey	Fresno N	W. Bonner, Michael Brandman Assoc. 2010	No sites found
??	>1 acre Chinatown Ex. Phase I	Fresno S	J & R Environmental Services 2008	No sites found

Although no archaeological resources have been recorded within the Fresno Fulton Corridor Specific Plan and Downtown Neighborhoods Community Plan project area, the vicinity encompasses a broad range of archaeologically sensitive settings. Among these are former creek environments that would have been attractive for prehistoric human occupation. The project area takes in most of central Fresno, encompassing neighborhoods associated with the earliest commercial and residential development of the community. It includes a number of neighborhoods associated with particular ethnic groups. Additionally, within the project area boundaries are areas historically associated with most of the principal industrial themes that were essential to the development and growth of the community in the late nineteenth and twentieth centuries. Among these are fruit processing operations and support, steel making, railroads, shipping, and lumber. Irrigation canals, central to the establishment and economic vitality of the community, are recorded within the FCSP/DNCP limits, as are other infrastructural systems and components. There is a potential for recovery of archaeological resources associated with all of these activities within the project area.

Past archaeological investigations have surveyed substantial portions of the current project area. There have been a number of linear surveys for highway and utility line construction, including a survey for the Highway 180 that examined a corridor more than five miles in length within the project area. Survey work for Highway 41 in the 1980s covered nearly three additional miles, and the survey for a proposed extension of the State Route 168 covered 1.25 miles. Further, a survey completed for a fiber optic cable line in 2006 looked at approximately five and a half miles within the project area along the Union Pacific railroad alignment in central Fresno. There have also been large acreage surveys for federal courthouse sites (18 acres), new school site surveys (10 acres), and a 300-acre survey for a residential development. Archaeological surveys completed for smaller projects have examined more than 50 additional acres within the current project area, including a 2008 Extended Phase 1 project in Chinatown that included a Ground Penetrating Radar (GPR) study and subsurface investigations.

That no significant site has been reported during the course of these investigations is surprising. These results should not be interpreted as indication that deposits associated with prehistoric or early historic occupation and activity are not present within the project area; they speak more to inadequate protocols for archaeological survey and testing in the past.

With few exceptions, the archaeological investigations previously conducted within the FCSP/DNCP project area have been limited to surface surveys. By their nature, surface surveys are often an ineffective method of locating buried deposits. When cultural deposits or features are not identified by surface surveys, typically subsurface testing and monitoring of project related excavation are not undertaken, with the result that archaeological deposits of potential significance are sometimes damaged or lost. Furthermore, because no sites have been reported, accurate estimates of cultural sensitivity or significance cannot be assessed from the records on file.

Clearly, traces of Fresno's early habitations, industry, and commerce presently lie buried on parcels currently vacant. The remains of Native American habitation may also exist. However, without archaeological sites having been recorded, accurate estimates of sensitivity – the potential for subsurface cultural deposits in a particular area – cannot be formulated. Without the 'trigger' of recorded resources in proximity, locations of true sensitivity have undoubted been impacted in the past without appropriate survey, testing, or monitoring of ground disturbing activity.

2.3.2 Literature and Archival Review Summary

The review of historic maps, aerial photographs, and literature conducted for the FCSP/DNCP project encompassed more than 1,480 city blocks. Using the criteria for assessment of archaeological sensitivity presented in Section 2.1.2, a total of 290 city blocks, or portions thereof – 136 in the FCSP area and 154 in the DNCP area – were assessed as possessing Moderate to High potential for the presence of subsurface archaeological deposits on the basis of documented historical development and current ground conditions (vacant). Although substantially larger in size, the DNCP area produced only slightly more positive results for archaeological sensitivity than the FCSP area. This outcome is largely due to later, post 1948-1950, development on many parcels within the DNCP, especially in the eastern reaches of the Plan Area. Further, Sanborn map coverage for those later developed areas is less complete. The detailed block-by-block results of the archival review are presented in Appendix C.

2.3.3 Native American Consultation Summary

The Native American Heritage Commission (NAHC) was contacted in writing during preliminary investigations conducted for the proposed Fulton Corridor Specific Plan/Downtown Neighborhoods Community Plan areas with a request for a listing of local Native American groups who have requested to be included in consultation. The NAHC responded with a list of 16 tribal representatives and letters were subsequently sent to each of the 16 tribes requesting consultation.

To date, two tribes have provided written responses to the consultation letters. In both cases, tribal representatives were not aware of any Native American cultural resources, or places of cultural importance to their respective groups, located within the FCSP/DNCP project area. They expressed no immediate concerns for ground-disturbing activities that may be conducted there, but both tribal representatives requested to be informed in the event that Native American artifacts or remains were encountered within the project area. The Native American response letters are included in Appendix A.

As part of the City's government-to-government consultation responsibilities under State Bill 18, a representative of the Planning and Development Department independently initiated consultation via telephone with each of the identified tribal groups between December 22, 2011 and January 12, 2012. Representatives of all 16 tribal groups were contacted. There were no additional questions or concerns raised by any tribal representative regarding the FCSP or DNCP.

2.4 Field Investigation Results

2.4.1 Archaeological Resources

The program of limited archaeological field investigations focused upon a cross section of parcel types identified in the course of archival and historical map review as possessing moderate to high sensitivity for the presence of cultural deposits. A total of 18 representative parcels located within both the FCSP and DNCP area were selected for pedestrian surface survey. The parcels ranged in size from full city blocks to several lots. The locations of the parcels surveyed are indicated on Figure 2-7.

While all of the parcels surveyed produced at least a limited amount of historical cultural material, in two locations – Block 50 and Block 534 – the density of cultural material and/or features identified indicated the presence of an archaeological site. The Block 50 site is located in the Chinatown neighborhood and comprises a dense concentration of historical artifacts, primarily Chinese and Japanese in origin. Constituents of the Block 534 site include several discrete structural features, all of which likely relate to an early twentieth century building that once stood on the parcel.

Also recorded was one feature isolate – a concrete slab believed to correspond with the location of an early twentieth century summer kitchen associated with Volga German residents of Block 1052. The sites and isolate are summarized below, and archaeological site records are attached in Appendix B.

Locations of Archaeological Field Investigations

Fulton Corridor Specific Plan Area

- Block 40E (Mariposa Street, Fagan Alley, Fresno Street, F Street)
- Block 50E (Tulare Street, China Alley, Mariposa Street, G Street)
- Block 50W (Tulare Street, F Street, Mariposa Street, China Alley)
- Block 52E (Inyo Street, China Alley, Kern Street, G Street)
- Blocks 501 and 502 (El Dorado Street, Railroad Tracks, Divisadero Street, H Street)
- Block 504 ([Amador Street], Railroad Tracks, [Sacramento Street], H Street)
- Block 516 (Ventura Street, Railroad Tracks, Mono Street, H Street)
- Block 534 (Inyo Street, G Street, Kern Street, Railroad Tracks)
- Block 535 (Mono Street, G Street, Inyo Street, Railroad Tracks)
- Block 536 (Ventura Street, G Street, Mono Street, Railroad Tracks)
- Block 537 (Santa Clara Street, G Street, Ventura Street, Railroad Tracks)
- Block 538 (San Benito Street, G Street, Santa Clara Street, Railroad Tracks)

Downtown Neighborhoods Community Plan Area

- Block 16 (Kern Street, C Street, Tulare Street, 99 Freeway)
- Block 295 (Fresno Street, A Street, Merced Street, B Street)
- Block 583 (Illinois Avenue, Clark Street, McKenzie Avenue, Valeria Street)
- Block 593 (Illinois Avenue, Effie Street, McKenzie Street, Diana Street)
- Block 1024 (Braly Avenue, Van Ness Avenue, Hamilton Avenue, Sara Street)
- Block 1052 (Belgravia Avenue, Cherry Avenue, Florence Avenue, Anna Street)

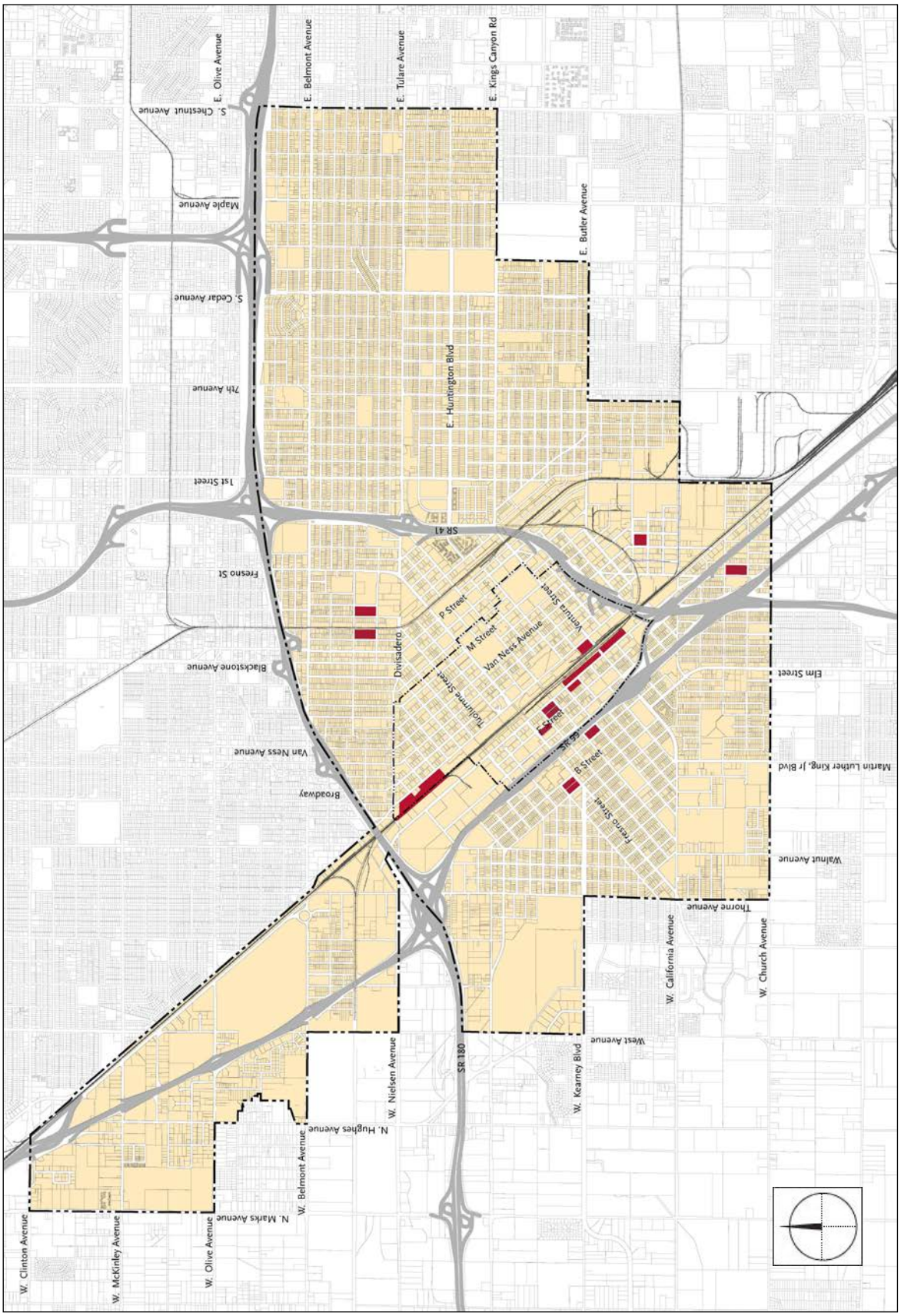


Figure 2-7. Locations of Archaeological Field Investigations.

Summary of Field Investigations

Block 16 (Kern Street, C Street, Tulare Street, 99 Freeway)

Historic Sanborn maps indicate that Block 16 had been laid out by 1898. In 1906 there were several dwellings and businesses identified as having Chinese occupants on the north half of the block, and by 1918 the northern portion of the block was densely built up, principally with Chinese occupied lodging houses and multi-family dwellings. The southwest quarter of Block 16 was the location for a two-story "Working Men's Home," which had become the Mayer Hotel by 1948. Presently, approximately one-quarter to one-third of the south/southwest section of Block 16 is undeveloped and a surface survey was completed on that portion. Based on its documented early development and historic density of Chinese occupied buildings, Block 16 was identified as having a moderate to high potential for the presence of subsurface archaeological deposits.

The parcel is presently overgrown with tall grass and surface visibility varies from 0-50%. Two dirt mounds approximately 3 ft high and 20 ft in diameter were recorded near Kern Street and the north-central part of the parcel. There were no artifacts or structural remains observed associated with the mounds. The density of historic cultural material scattered across the parcel was uniformly very light. Observed artifacts included several fragments of Chinese porcelain, undecorated stoneware, and sanitary porcelain, most of which date to around the turn of the twentieth century. Glass was represented by less than 10 aqua, blue, clear, and milk glass fragments, as well as a brown glass marble.

While only a limited amount of historic cultural material was visible on the surface, this parcel is still viewed as possessing moderate to high potential for the presence of subsurface deposits on the basis of historical map review.

Block 40E (Mariposa Street, Fagan Alley, Fresno Street, F Street)

There were several frame residences on the eastern half of Block 40 by 1888. By 1898, commercial development on the block had begun, and there was a blacksmith and general repair shop owned by George Larsen, a saloon, and other establishments on the northern half of Block 40E. On the opposite end of the block was a corral and frame residence. Several additional residences adjoined the corral in 1906, including two that fronted on Fagan Alley. In 1918, the businesses on the northern end included a Japanese laundry, restaurant, Italian hotel, and photo developer. The corral on the southern end had expanded into the "Kutner Goldstein Co. Stables." By 1948, brick row buildings on the north half of the block included shops and a bakery. Brick commercial buildings stood along side older frame dwellings on the south half of Block 40E as well. The south half of the block is presently undeveloped. It was identified as having moderate to high potential for subsurface archaeological deposits based on review of historic maps.

Currently, the parcel is open, recently disked, and only slightly overgrown, with surface visibility of approximately 75%. The surface is flat with a light scatter of cultural material evenly distributed across the parcel. Material observed includes brown and milk glass fragments, ceramic fragments including whiteware and Chinese porcelain, an oyster shell, and a Venus clam shell. No cultural features of any type were observed on the surface of the parcel.

While only a limited amount of historic cultural material was visible on the surface, this parcel is still viewed as possessing moderate to high potential for the presence of subsurface deposits on the basis of historical map review.

Block 50E (Tulare Street, China Alley, Mariposa Street, G Street,)

Located in the heart of historic Chinatown, Block 50E was once one of the most densely developed blocks in this district. By 1885, the block was already substantially built out with a diverse variety of commercial establishments identified on historic maps as Chinese. Comprising both wood frame and brick structures one to two stories in height, these included general merchandise stores, apothecaries, gambling halls, laundries, grocers, and dwellings. Several row buildings are labeled “Chinese Women,” generally understood to indicate brothels. By 1898, the block had been dramatically rebuilt with narrow brick row buildings, primarily one story, which fronted on both G St. and China Alley (Figure 2-8). Almost all of the buildings had basements. The earlier commercial uses persisted, with structures now identified as theaters, lottery parlors, saloons, and “F.B.” for Female Boarding – another euphemism for brothel. Few residential structures are indicated. Physically, Block 50E remained virtually unchanged at the time of its 1948 mapping. Gone are the labels identifying vice-oriented businesses; there are now more restaurants, dwellings, and lodgings. Because of the historic density of brick buildings, almost all of which incorporated basements, Block 50E was identified as having a high potential for recovery of buried archaeological deposits.

Currently, Block 50E is graded level and entirely open with the exception of one small commercial structure at the south end. There is also a paved area at the northwest corner, thought to have been a parking lot associated with adjacent commercial buildings. Approximately two-thirds of the lot had recently been disked and surface visibility was good: approximately 60-70%. The central third of Block 50E is overgrown with tall grass and visibility was 0-10%. Cultural material associated with the historic occupation of the parcel was limited to a very light scatter of assorted ceramic fragments (glazed earthenware, white porcelain, and celadon), fragments of bottle and pane glass, and butchered pig bone (cleaved). Several fragments of sand struck and pressed bricks, likely from the late nineteenth and early twentieth century buildings once on the site, were observed along the west side of the block, adjacent to China Alley. No physical evidence of former building locations, concentrations of artifacts, or other features was observed.

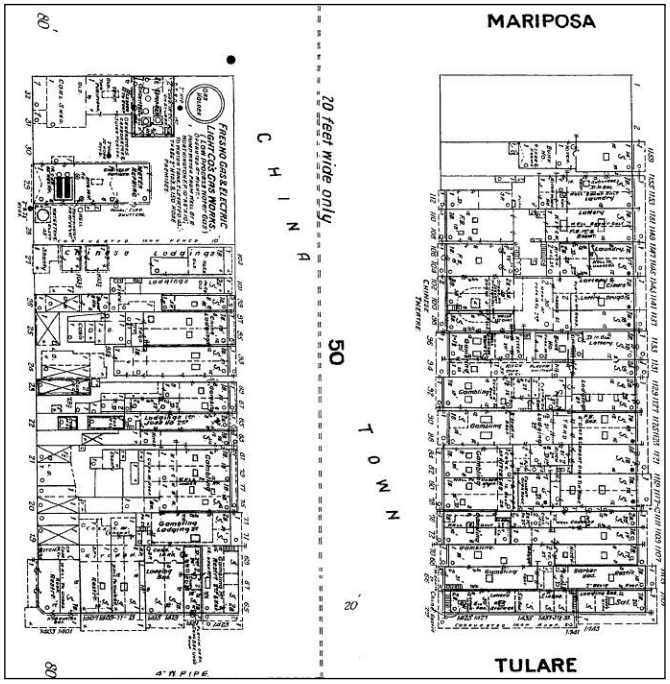


Figure 2-8. 1898 Sanborn map detail of Block 50.

While only a limited amount of historic cultural material was visible on the surface, this parcel is still viewed as possessing moderate to high potential for the presence of subsurface deposits on the basis of historical map review.

Block 50W (Tulare Street, F Street, Mariposa Street, China Alley)

Block 50W is immediately west of Block 50E, on the opposite side of China Alley. The Fresno Gas Light Company had facilities at the north end of the block by 1885 which had expanded to

occupy the entire northern third of the block by 1888. During the mid to late 1880s the southern portion of the block was developed with structures of both brick and wood frame indicated by early maps as predominantly occupied by Chinese residents. Commercial buildings fronted on both Tulare Street and China Alley, which was an active thoroughfare in its own right. Building uses identified include stores, restaurants, laundries, and residences. As with Block 50E, this block was radically transformed between 1888 and 1898, when most of the earlier structures were replaced with continuous rows of one and two story brick structures with basements, again fronting on both Tulare and China Alley. Buildings along F Street were principally frame outbuildings at that time. Throughout the first half of the twentieth century, the southern two-thirds of the block was home to various Chinese operated lodging and gambling houses, restaurants, and stores, with an auto garage taking over the north end. On the basis of its early development and the historic density of buildings, particularly brick buildings, almost all of which incorporated basements, Block 50W was identified as having a high potential for recovery of buried archaeological deposits.

Today, Block 50W is largely vacant. The central third of the block is an open, unimproved parcel, most of which has recently been disked. This area was surveyed and surface visibility was approximately 70-80%. No structural features were observed, although uneven areas on the surface of the lot may suggest possible locations for former structures. The density of historic cultural material present on the surface is relatively high, and artifacts are fairly evenly distributed across the northern two-thirds of the parcel. The southern third has not been disked and fewer items were visible on the surface there. The artifacts observed typically date from the late nineteenth to the early twentieth centuries and include a wide variety of ceramic fragments of Chinese origin, ranging from brown earthenware to celadon and hand-painted porcelain. Fragments of bottle glass and other hollowware in a range of colors were noted, as was part of a leather shoe and an electrical knob insulator, among other items.

Based on the high density of historic cultural material observed on the surface, the central portion of Block 50W was recorded as an archaeological site. A site record for Fresno Chinatown Block 50 is included in Appendix B.

Block 52E (Inyo Street, China Alley, Kern Street, G Street)

There were frame commercial buildings and dwellings on Block 52E as early as 1885. In 1898, there were two livery stables with feed yards on the block, along with a “Japanese Boarding & Lodging” house. By 1906, most of the block was occupied by a single large feed yard with adjacent wagon, harness, and storage sheds, and a brick blacksmith shop. On the remainder of the block stood Japanese boarding houses, Chinese dwellings, and several businesses. The “Westside Livery & Feed” still dominated the block in 1918, flanked by substantial new brick buildings housing a diverse array of enterprises, including a French laundry, a bicycle repair shop, and Japanese boarding houses. By 1948, the livery stable had vanished, replaced by additional brick commercial structures occupied by restaurants, lodgings, and a Turkish bath. Block 52E was determined to have moderate to high potential for subsurface archaeological resources based on the review of historic maps.

Block 52E is presently vacant, with the exception of a single early twentieth century commercial building at its north end. The vacant parcel has been disked and surface visibility was good – approximately 70-80%. A diffuse surface scattering of historic cultural material was recorded by the survey, with an area of somewhat heavier concentration noted on the northwest quarter of the parcel. The cultural material was determined not to be of sufficient density to warrant recordation as an archaeological site, however. Artifacts observed on the surface principally dated from the late nineteenth century to the mid-twentieth century. These included ceramic

fragments (Chinese porcelain, glazed stoneware, etc.), a black abalone fragment, clear, aqua, and milk glass fragments, and an electrical porcelain insulator fragment pre-dating 1930. There were no structural indications, or other cultural features observed on the parcel.

Block 295 (Fresno Street, A Street, Merced Street, B Street)

Block 295 was first documented by the 1906 Sanborn maps, when it supported a number of small wood frame dwellings and outbuildings, including a water tower. In 1918, there were mostly residences on the southern half of the block, while buildings on the northern half included frame and brick commercial structures along with residences. Roughly half of the residences had a backyard oven or detached kitchen, common features on properties occupied by members of the Volga German ethnic group. Commercial development on the block had increased by 1948, primarily businesses related to automobile repair and service. Block 295 was identified as having moderate to high potential for subsurface archaeological deposits.

The northwest corner of Block 295, which historically supported commercial structures and dwellings, including one with a backyard oven, is currently undeveloped and open, and was surveyed. An exposed fragment of concrete slab measuring roughly 4 x 6 ft was identified near the eastern boundary of the parcel. The location of the slab most closely corresponds with a frame dwelling with a backyard oven depicted on the 1918 Sanborn map. The house had been removed by 1948, and its lot remained undeveloped at that time, although the oven remained. In addition, a hump was noted in the eastern half of the survey area; this hump may represent the location of a former structure. Most of the cultural materials observed on the surface of Block 295 date to the late nineteenth and early twentieth centuries. These included fragments of Chinese porcelain, glass (sun-tinted amethyst and milk glass), and an electrical split-knob insulator fragment.

Blocks 501 and 502 (El Dorado Street, Railroad Tracks, Divisadero Street, H Street)

Blocks 501 (north half) and Block 502 (south half) lie along the northeast side of the Southern Pacific/Union Pacific railroad alignment, which was established in 1872. Development on Block 501 is first indicated on the 1906 Sanborn map, when there were several wood frame houses fronting on Divisadero Street. By 1918, numerous rail sidings crossed the west half of Block 502, while Block 501 supported a mix of residential and industrial buildings; the storage facilities, machine shop, and warehouses of the Associated Pipe Line Company were there, as were the facilities of the Fresno Canal & Land Corporation. The extensive facilities of the Willard Lumber and Supply Company occupied most of both blocks in 1948, along with a gas station and Pennzoil Co. warehouse on the H Street side. Blocks 501 and 502 were determined to have moderate to high potential for subsurface archaeological resources based on the number and types of properties recorded there historically.

Both blocks are now overgrown with tall grass, and surface visibility is limited to 20-40%. There are sections of old asphalt pavement that likely postdate features on the 1948 map in the southern quarter, center, and northwest corner of the parcel. The northern portion adjacent to Divisadero Street is fenced and inaccessible. There are surface indications of former railroad tracks on the western portion of the parcel, but all rails and ties have been removed. Observed cultural materials included railroad spikes and tie plates, fragments of clear and amethyst glass likely pre-dating 1920, and modern debris.

Block 504 ([Amador Street], Railroad Tracks, [Sacramento Street], H Street)

First depicted on the 1898 Sanborn map, Block 504 was undeveloped at that date, identified as part of the Southern Pacific “R. R. Reservation.” In 1906, the parcel was home to Fancher

Creek Nurseries, which had a packing and shipping shed, greenhouse, and two lath arbors, all of which were supplanted by 1918 by numerous rail sidings. In 1948, there was a large concrete produce warehouse and an auto shed along H Street. Block 504 was determined to exhibit moderate to high subsurface archaeological potential.

With the exception of a post 1950 warehouse at its north end, the parcel is now completely open and flat, moderately overgrown with surface visibility of 60-70%. Cultural material observed on Block 504 consists primarily of modern glass and debris; however, a limited quantity of historic red brick fragments, clear, brown, and milk glass fragments, as well as glazed tile fragments were also recorded. The former location of railroad tracks is evident on the surface, but all components have been removed. There is no evidence of structural remains.

Block 516 (Ventura Street, Railroad Tracks, Mono Street, H Street)

Block 516 was first illustrated on the 1888 Sanborn map, when it was home to the Pacific Fruit Company, which operated a dried fruit packing plant on the south end of the block. There were no additional buildings, but a rail siding crossed the west side of the block. By 1898, the packing facility become the Chaddock Home Packing Company, which also specialized in dried fruit. The packing house shared the block with the Valley Lumber Company, which managed a large lumber warehouse on the northern three-quarters of the block. The Valley Lumber Company expanded through the mid twentieth century and incorporated storage buildings for paint, lime, cement, and shingle in addition to lumber. On the basis of historic map review, Block 516 was determined to exhibit moderate to high subsurface cultural material potential, with limited research potential.

Currently, the northern third of Block 516 is vacant, and this area was surveyed. It is covered in grass and weeds with 10-25% visibility. An exposed section of concrete slab measuring 2 x 3 ft was observed in the southeast corner of the parcel. None of the identified lumber company buildings corresponds with the slab's location. It is possible that the feature represents a section of concrete pavement situated between the buildings or a remnant of a structure present on the site after 1948. Surface artifacts were limited to a very light diffuse scatter of amethyst, clear, and brown bottle glass fragments. There is modern debris scattered across the property as well.

Block 534 (Inyo Street, G Street, Kern Street, Railroad Tracks)

Residential and industrial development had commenced adjacent to Block 534 by 1888, and by 1898 there was a Union Ice Co. facility and a grain warehouse for the Farmer's Warehouse Co. on the block, in addition to rail sidings along its eastern third. By 1906, there was a beer bottling concern, a packing house for the Earl Fruit Co., Madary's Brick Warehouse, which later became the Associated Warehouse Co. and, by 1948, a Sears, Roebuck & Co. warehouse. Also present in 1948 were the Penny-Newman grain and feed warehouse, and a second feed mill and storage facility. Because of its lengthy history of industrial and commercial use, Block 534 was determined to have high potential for buried archaeological resources.

Currently, a single warehouse stands in the middle of Block 534, the former Sears, Roebuck & Co. building. The remainder of the parcel was surveyed. The southern portion is overgrown and visibility is limited to 20-30%. Cultural material observed was limited to a small number of ceramic fragments, including a piece of brown glazed roof or sewer tile. The northern portion of the block is largely covered by dirt and weeds. The central area is somewhat mounded and slightly higher in elevation compared to an adjacent concrete slab and the former railroad track bed. There are fragments of red brick and concrete, possibly from structural demolition, along the north side of the standing building. Railroad ties are present at the east end of the building. Structural remains were encountered in the north section of Block 534, including a large

concrete slab covering much of the western portion of the lot, an adjoining concrete wall/foundation with integrated concrete and brick buttresses along the G Street sidewalk, and a north-south brick foundation segment approximately 4 ft long, located in line with the rear wall of the existing warehouse, adjacent to Kern Street. These elements all seem to be associated with the Penny-Newman Grain Co. warehouse, constructed sometime between 1918 and 1948. Circular stains observed on the concrete slab appear to correspond with large steel grain bins that were once within the warehouse. Cultural materials found at this part of the lot also include amethyst and aqua glass bottle glass fragments. The potential for recovery of additional structural remains on the parcel is considered good.

Based on the structural and railroad features observed on the surface, the northern portion of Block 534 was recorded as an archaeological site. A site record for Fresno Block 534 is included in Appendix B.

Block 535 (Mono Street, G Street, Inyo Street, Railroad Tracks)

Development within Block 535 had started by 1888, when there were two small railroad Section Houses along the tracks on the parcel's east margin. By 1898, Louis Einstein & Co. had a grain warehouse on the central part of the block, which was served by one of several new railroad sidings. In addition, there were three small "Chinese" dwellings immediately east of the sidings, and the Hobbs-Parsons Co. operated a dried fruit packing warehouse on the south end of the block. By 1906, still more sidings or storage tracks had been added, the Louis Einstein Co. warehouse was supplanted by the expanded facilities of the A.L. Hobbs Co. packing house, and the Barrett Hicks Co. had an iron storage warehouse at the north end of Block 535. Rosenberg Bros. & Co. had taken over and further expanded the former Hobbs-Parsons fruit packing house by 1918, and it now occupied most of the block. By 1948, most of the Rosenberg Bros. facility had been removed and the remaining buildings on the block were used for fertilizer, building material, and feed storage. Block 535 was determined to have high potential for subsurface archaeological deposits.

Block 535 is presently occupied by two pre 1948 warehouses, one at mid block, and the other along Mono Street. The areas between, north, and east of the buildings are open were surveyed. Approximately 40-50% of the ground surface was visible. The southern area is covered in grass and features a somewhat irregular surface, which may be indicative of former structures. A railroad tie alignment, without rails, corresponding with a former railroad siding was observed in line with the rear walls of the remaining buildings. Gravel covers the eastern margin of the parcel, and patches of very old asphalt pavement were recorded along the western edge and central area of the parcel. There was an assortment of modern glass, ceramic, and plastic trash. No historical cultural materials were present.

The northern portion of the block near Inyo Street is open and flat. Grass reduces surface visibility to 20-30%. Elevation is the same as the adjacent railroad track bed. There is a paved driveway or road along the track alignment. No cultural material aside from modern debris was observed in the northern area of Block 535.

Block 536 (Ventura Street, G Street, Mono Street, Railroad Tracks)

J.F. Burleigh's grain warehouse, with adjacent hog pens, and brick General Storage warehouse, are the earliest buildings recorded on Block 356. Indicated on the 1898 Sanborn map, they spanned the entire length of the block. There were also four siding and storage tracks on the eastern portion of the block. A barley steamer with a large boiler had been added to the facilities by 1906, and by 1918, the greatly expanded and now tin-clad complex was the general storage facility of the Merchant's Warehouse Co. Platforms served the north, east, and west sides of the

building. By 1948, the warehouse, with wood and concrete floors, was a packaging and receiving facility for the Roeding Fig Company, which had another facility on Block 538. Block 536 was identified as having high potential for subsurface cultural deposits.

There are currently no buildings on Block 536, and the entire parcel is dirt covered with low grass and gravel. The central portion of the block is slightly mounded, possibly indicating capping. The eastern third of the block is somewhat depressed where railroad tracks and siding once existed. Near Ventura Street, there is a dirt pile roughly 3 ft high, measuring 25 x 25 ft. No artifacts or structural features are associated with the dirt pile. Asphalt paving was observed along the western margin adjacent to G Street, and asphalt pavement at the northwest corner runs 15 ft east-west and 100 ft north-south. A circular concrete pad was also recorded at the northeast corner of the property near the railroad track/siding area, at approximately 40 ft south of Mono Street. The pad measures approximately 8 ft in diameter and at least 4 inches thick. It likely dates to after 1948 and the removal of the Southern Pacific Railroad's siding and storage tracks that once occupied this area. Cultural materials observed on Block 536 include fragments of ceramic (painted earthenware, stoneware) and assorted clear and brown glass fragments. There is a noticeable amount of modern debris, particularly automobile parts, scattered throughout the parcel.

Block 537 (Santa Clara Street, G Street, Ventura Street, Railroad Tracks)

In 1898, Block 537 was the site of a wood frame dried fruit packing house for the Griffen & Skelley Company and the Earl Fruit Company's warehouse. By 1906, Griffen & Skelley had expanded its operations over the entire block, including a new brick warehouse on the Earl Fruit Company site. There was a rail siding serving the business, and there were additional siding and storage tracks on the eastern portion of the block. Between 1918 and 1948, the property was transferred to the California Packing Corporation and the southern half of the facility was removed. Because of its extended industrial use, Block 537 was identified as having high potential for subsurface archaeological resources.

Block 537 is now an open parcel with no standing buildings. The remains of a paved driveway parallel the railroad tracks on the east side of the block and extend southward toward Block 538. A second area of deteriorated paving measuring approximately 30 x 100 ft at the northwest corner of the block was likely a parking lot associated with the former packing house. The surface of Block 537 is compacted, 70-80% visible, and covered with grass, gravel, and dirt. There is slight mounding in the middle, and elevation decreases towards the edges of the block. Fragments of red-brown bricks were observed at the northern end of Block 537, possibly associated with historic buildings on the site, as well as ceramic fragments (earthenware and stoneware) and glass fragments of various colors.

Block 538 (San Benito Street, G Street, Santa Clara Street, Railroad Tracks)

Block 538 was first depicted on the 1898 Sanborn map, when the J.B. Inderrieden Co. had a dried fruit and raisin packing house on the north end of the parcel. The one story wood frame building included sweat rooms with an associated boiler. A rail siding ran along the east side of the building, and there were additional sidings and storage tracks on the east third of the block. Shortly after 1900, a new and larger frame packing house operated by the "Roeding Fig Packing Co." stood on the block. By 1918, this structure was gone, replaced by a sheet iron-clad packing house with a basement at the south end of Block 538, still owned by the "Roeding Fig & Olive Co." In 1948, the packing house was still active as the "Roeding Fig Company." The substantially expanded plant included a large detached boiler house. A review of historic maps for Block 538 identified the parcel as having a high potential for buried archaeological deposits.

No buildings currently exist on Block 538, which is covered with gravel and weeds. Surface visibility was 70-80%. Slight mounding was noted in the central part of the parcel and the surface elevation gradually lowers toward G Street and the railroad tracks. The area along the railroad frontage is paved – apparently an old driveway - but there is no indication of buried tracks or other structural features. Historic cultural material observed on the surface was limited to very small ceramic fragments (painted earthenware, stoneware, and porcelain) and fragments of colored glass, some of which date from the late nineteenth and early twentieth centuries. Modern debris was observed throughout the parcel.

Block 583 (Illinois Avenue, Clark Street, McKenzie Avenue, Valeria Street)

Block 583 has historically been a residential block. In 1898, when it was first illustrated on Sanborn maps, there were approximately 13 one- and two-story wood frame dwellings on it. One dwelling at the northeast corner had a windmill and tankhouse. Residential development continued over the years, and by 1919 the block was fully built out with single family residences. Each of the properties had at least one back-of-lot outbuilding, often including auto garages. This remained the condition at the time of the 1950 mapping. A review of historic maps for Block 583 determined moderate to high potential for subsurface archaeological deposits based on its lengthy development history.

Currently, Block 583 includes a number of older dwellings, but most of the block is developed with medical related buildings and surface parking lots. There is a vacant parcel at the northwest corner of the block which was surveyed. The former site of two late nineteenth century houses and numerous outbuildings, the parcel's surface is flat and completely exposed. There were no structural or other features observed. Historic artifacts recorded include brown glass and yellow glazed earthenware fragments. A few brick fragments were also noted along the southern boundary of the parcel, which may or may not correspond with historic structures on the parcel.

Block 593 (Illinois Avenue, Effie Street, McKenzie Street, Diana Street)

Also a residential block, Block 593 was laid out in the late 1800s and by 1898 had eight wood frame dwellings on it, along with numerous outbuildings. By 1906, "Chemical Engine Ho. No. 1" stood at the block's northwest corner. It was indicated as "Fire Dept. Truck No. 1" on the 1919 map. The fire station was the only non-residential building on the block through 1948. Historic maps identified Block 593 as having moderate to high potential for subsurface archaeological deposits, based on the age and density of its development.

The south end of Block 593 is presently vacant. Historically, three late nineteenth and early twentieth century houses and numerous outbuildings stood on these lots. The ground surface is completely overgrown with grass and weeds, and generally flat with 20-30% visibility. The western half of the parcel is uneven, which may be an indication of former structure locations. The surface does not present any cultural materials aside from modern refuse.

Block 1024 (Braly Avenue, Van Ness Avenue, Hamilton Avenue, Sara Street)

The earliest Sanborn map of Block 1024 from 1906 shows that residential development on the block was well under way at that time, with 10 houses extant, all but one of which were wood frame. A surprisingly high number of these – four – had associated windmills and tankhouses, and all had at least one outbuilding. Only one dwelling and a small soda bottling operation had been added to the block by 1918. The character of the block had changed significantly by 1948 with the addition of a number of commercial buildings of both wood frame and brick

construction, principally on the block's west half. The existing stucco commercial building at the southwest corner was the largest building on the block, and there was a gas station at the corner of Van Ness and Hamilton. Block 1024 was identified as having moderate to high potential for subsurface cultural resources based on the nature and age of the historic development.

The east half of Block 1024 is presently completely open with the exception of the Hamilton Avenue frontage. The parcel is recently disked and the ground surface is 50-60% visible. Historic cultural material, particularly ceramic (earthenware, stoneware, Chinese porcelain), glass (sun-tinted amethyst, brown, clear, milk glass) fragments, and fragments of red brick were found diffusely scattered throughout the parcel. A greater density of material was noted on the northern third, where a higher percentage of ceramic dinnerware fragments were recorded. No structural remains or other features were observed. Modern refuse was also scattered throughout the parcel.

Block 1052 (Belgravia Avenue, Cherry Avenue, Florence Avenue, Anna Street)

Block 1052 is situated just east of the 41 and 99 Freeway junction. It was first depicted on the 1918 Sanborn map, when there were approximately two dozen single-story dwellings there (Figure 2-9). Half of the homes included detached backyard kitchen structures – features that were common on properties belonging to members of the Volga German ethnic group. The block's configuration remained relatively unchanged in 1948, although several of the kitchens had been removed by that date. Block 1052 is identified as having high potential for subsurface cultural resources.

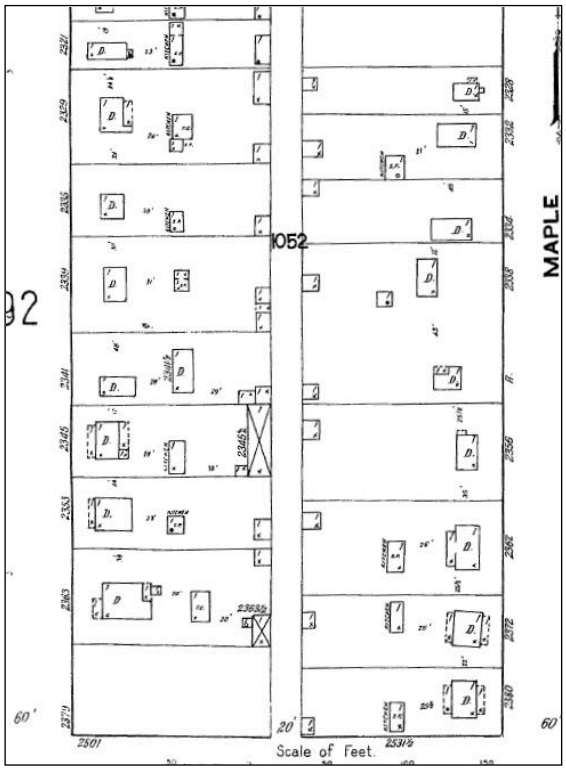


Figure 2-9. Detail of 1918 Sanborn map of Block 1052.

All but two lots on the west half of the block are presently vacant and were surveyed. The open areas are typically overgrown with tall weeds, bushes, and trees, reducing surface visibility to 0-50%. Artifacts observed on the surface include limited quantities of historic ceramic and brick fragments, the latter of which may have been either a part of the former structures or brought in from elsewhere as refuse. A mound measuring 3.5 x 15 x 15 ft was noted at the center of a lot near the south end of the parcel, with no associated artifacts. Just east of this mound is a concrete pad measuring approximately 18 x 20 ft. This pad appears to correspond with a structure indicated as a "Kitchen" on the 1918 and 1948 Sanborn maps. The structure was either replaced or expanded between 1918 and 1948, since its dimensions correspond more closely with the dimensions depicted on the 1948 map. There were no artifacts found directly associated with the concrete pad.

The ground surface across this parcel exhibits irregularities and slight depressions that may indicate former sites of structures and houses. Modern refuse was observed scattered throughout the surface of the parcel.

The concrete pad observed in the southern portion of Block 1052 was recorded as an isolated cultural feature rather than as an archaeological site due to the dearth of associated artifacts or features. A record of the isolate is included in Appendix B.

3.0 Environmental Impacts

3.1 Standards of Significance

Adopted standards of significance that are applicable to cultural resources are provided in the State *Guidelines for Implementation of the California Environmental Policy Act* (2009). Significance criteria considered for the cultural resources evaluation are provided below.

3.1.1 Historical Resources

As defined by Section 15064.5(a) of the State CEQA Guidelines, the term "historical resource" includes the following:

- A resource listed in, or determined eligible for, listing in the California Register of Historical Resources (PRC Sections 5024.1);
- A resource included in a local register of historical resources, or identified as significant in an historical resource survey meeting the requirements of Section 5024.1(g) of the PRC. Public agencies must treat any such resource as significant unless the preponderance of evidence demonstrates that it is not historically or culturally significant;
- Any object, building, structure, site, area, place, record, or manuscript which is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California, provided the lead agency's determination is supported by substantial evidence in light of the historical record.
- Generally, a resource shall be considered by the lead agency to be "historically significant" if the resource meets at least one of the four criteria for listing on the California Register of Historical Resources (PRC Section 5024.1[a]), which are as follows:
    1. It is associated with events that have made a significant contribution to the broad patterns of California history and cultural heritage;
    2. It is associated with the lives of persons important in our past;
    3. It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
    4. Has yielded, or may be likely to yield, important information in prehistory or history.

National Register of Historic Places

In order for a property to be eligible for the National Register of Historic Places, it must meet one of the four National Register Criteria for Evaluation listed below. As established by the National Historic Preservation Act of 1966, to be listed in the National Register, or determined eligible for listing, properties must be associated with an important historic context and meet

certain criteria for historical significance. Qualities of significance may be found in aspects of American history, architecture (interpreted in the broadest sense to include landscape architecture and planning), archaeology, engineering, and culture. To be eligible, qualities of integrity must also be evident in the resource, measured by the degree to which it retains its historic location, design, setting, materials, workmanship, feeling, and association. A property is eligible for the NRHP if it is significant under one or more of the following criteria:

A. It is associated with events that have made a significant contribution to the broad patterns of our history; or

B. It is associated with the lives of persons significant in our past; or

C. It embodies the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or possess high artistic values, or represents a significant and distinguishable entity whose components may lack individual distinction; or

D. It has yielded, or may be likely to yield, information important in prehistory or history.

California Register of Historical Resources (CRHR)

As provided in California Public Resources Code Section 5020.4, the California Legislature established the CRHR in 1992. The CRHR is used as a guide by state and local agencies, private groups, and citizens to identify the state historical resources and to include which properties are to be protected, to the extent prudent and feasible, from substantial adverse change. The CRHR, as instituted by the California Public Resources Code, automatically includes all California properties already listed in the NRHP. It also includes those formally determined to be eligible for listing in the NRHP (Categories 1 and 2 in the State Inventory of Historical Resources), as well as specific listings of the State Historical Landmarks and in the State Inventory of Historical Resources, and specific listings of State Historical Landmarks and State Points of Historical Interest. The CRHR may also include various other types of historical resources that meet the criteria for eligibility, including the following:

- Individual historic resources;
- Resources that contribute to a historic district;
- Resources identified as significant in historic resource surveys; or
- Resources with a significance rating of Category 3 through Category 5 in the State Inventory (Categories 3 and 4 refer to potential eligibility for the NRHP; Category 5 indicates a property with local significance).

The CRHR follows the lead of the NRHP in utilizing the 50-year threshold. A resource is usually considered potentially historically significant after it reaches the age of 50 years. This threshold is not absolute, but was selected as a reasonable span of time after which a professional evaluation of historical value and importance can be made.

City of Fresno Historic Designation

The City of Fresno's Historic Preservation Ordinance (Ordinance) was approved by the City Council in 1979 and revised in 1999 (Fresno Municipal Code Sect. 12, Art. 16). The intent of the Ordinance is "to preserve, promote and improve the historic resources and districts of the City of Fresno for educational, cultural, economic and general welfare of the public…." The Ordinance

establishes three categories of designation for properties in Fresno – *Historic Resource, Heritage Property*, and *Local Historic District*. The criteria for City of Fresno historic designation correspond closely with criteria established for State and National Register eligibility, and are as follows:

Historic Resource Designation

The City of Fresno Historic Preservation Commission and City Council may designate any building, structure, object or site as a Historic Resource if it is found to meet the following criteria:

1. It has been in existence more than fifty years and it possesses integrity of location, design, setting, materials, workmanship, feeling and association, and:

   a. It is associated with events that have made a significant contribution to the broad patterns of our history; or

   b. It is associated with the lives of persons significant in or past; or

   c. It embodies the distinctive characteristics of a type, period or method of construction, or represents the work of a master, or possesses high artistic values; or

   d. It has yielded or is likely to yield, information important in prehistory or history.

Additionally, a property may be eligible for designation as an Historic Resource if it is less than fifty years old and meets the above-listed criteria, and is found to have exceptional importance within an appropriate historical context at the local, state, or national level.

Heritage Property Designation

Any building, structure, object or site may also be eligible for designation as a Heritage Property by the City of Fresno Historic Preservation Commission if it is found by the Commission to be worthy of preservation because of its historical, architectural or aesthetic merit.

Local Historic District Designation

In order for a group of properties to be designated as a Local Historic District (LHD) by the City of Fresno, there must be a finite group of resources related to one another in a clearly distinguishable way; or a geographically definable area that possesses a significant concentration, linkage or continuity of sites, buildings, structures or objects united historically or aesthetically by plan or physical development. Additionally, the proposed LHD must meet one or more of the following criteria:

1. It exemplifies or reflects special elements of the city's cultural, social, economic, political, aesthetic, engineering, or architectural heritage; or

2. It is identified with a person or group that contributed significantly to the culture and development of the city; or

3. It embodies the distinctive characteristics of a style, type, period or method of construction, or is a valuable example of the use of indigenous materials or craftsmanship; or

4. Structures within the area exemplify a particular architectural style or way of life to the city; or

5. The area is related to a designated historic resource or district in such a way that its preservation is essential to the integrity of the designated resource or Local Historic District; or
6. The area has potential for yielding information of archaeological interest.

3.1.2 Thresholds for Significant Impacts

Archaeological Resources

In accordance with the CEQA Guidelines, a project will have a significant adverse impact on archaeological resources if it results in:

- A substantial adverse change in the significance criteria of an archaeological resource pursuant to Section 15064.5 of the CEQA Guidelines;
- Disturbance of any human remains, including those interred outside a formal cemetery; or
- Impacts on Native American resources with a potential for affecting sites considered important for their position in the Native American physical universe or belief system, and/or the possibility of reduced access to traditional areas or sacred sites.

3.2 Project Impacts

3.2.1 Archaeological Resources

The review of historic maps, aerial photographs, and literature conducted for the FCSP/DNCP identified a total of 290 city blocks, or portions thereof – 136 in the FCSP area and 154 in the DNCP area – that possess a Moderate to High potential for the presence of subsurface archaeological deposits on the basis of documented historical development and current ground conditions (vacant). Areas of archaeological sensitivity were identified by these investigations in each of the defined districts and subareas. Implementation of the FCSP/DNCP has the potential to damage or destroy as yet unrecorded subsurface deposits on these parcels identified as archaeologically sensitive. Potential impacts to archaeological resources are characterized below by Specific Plan District or Community Plan Subarea.

Fulton Corridor Specific Plan

Central Business District. Within this District, the FCSP would "prioritize adaptive reuse of Fresno's unique, older buildings, including those listed on the Local, State, and National historic registers" and "infill vacant land rather than tearing down distinctive, older buildings…." These activities have a potential to impact as yet unidentified archaeological resources within the CBD.

Cultural Arts District. Of specific concern for archaeological resources, within the Cultural Arts District the FCSP proposes to introduce mixed use development and "adaptively reuse buildings along Van Ness Avenue and Fulton Street." These activities have a potential to impact as yet unidentified archaeological resources.

Civic Center District. Within the Civic Center, the FCSP proposes landscaping Mariposa, Merced, Fresno, Tulare, and Kern Streets to direct pedestrian activity toward the Fulton Mall. Landscaping activity has the potential to impact as yet unidentified archaeological resources at the building edge areas within the Civic Center.

South Stadium District. FCSP goals for the District include its transformation into "a mixed-use district that introduces a diversity of new uses" while also revitalizing and reusing the existing older buildings that currently line Fulton Street. These adaptive reuse and redevelopment activities carry the potential to impact archaeological resources yet to be recorded.

Chinatown. The FCSP proposes to "infill Chinatown's many vacant lots with sensitively scaled, mixed-use, pedestrian-friendly buildings…and establish F Street as the districts new main street." The infilling of vacant lots and associated reuse of existing buildings has the potential to impact known and yet to be discovered archaeological resources.

*Armenian Town/Convention Center Distric*t. Within the Armenian Town District, the intention of the FCSP is to "transform this area into a walkable and bikable mixed-use place by infilling vacant parcels with pedestrian-friendly, mixed use buildings and also introduce larger office buildings." These actions may result in impact to as yet unidentified archaeological resources.

Divisadero Triangle. As in the Armenian Town District, the FCSP would transform the Divisadero Triangle into "a walkable mixed-use place by infilling vacant parcels with shopper-friendly buildings." Another goal is to "consolidate and relocate isolated older buildings from throughout Downtown within the Divisadero Triangle." These actions may result in impact to as yet unidentified archaeological resources.

Downtown Neighborhoods Community Plan

Jane Addams Neighborhoods. The DNCP envisions infilling the Jane Addams Neighborhoods subarea over time, while retaining its informal agricultural character. Among other actions, it would also make the subarea more self-sufficient through the introduction of neighborhood shopping centers. These actions could potentially impact as yet unidentified archaeological resources.

Southwest Neighborhoods. Under the DNCP, vacant neighborhood parcels within the Southwest Neighborhoods area, such as those west of State Route 99, would be infilled with "house-scaled, pedestrian-oriented buildings such as houses, duplexes, triplexes, and "granny flats," with "more intense building types" developed along Fresno Street. Implementation of the DNCP has the potential to impact the Block 1052 Isolate site, identified by these investigations within the Southwest Neighborhoods subarea, along with other, yet to be discovered, archaeological resources.

Lowell Neighborhood. The DNCP calls for older building stock within the Lowell Neighborhood to be restored. Vacant parcels would be infilled with "house-scaled, pedestrian-oriented buildings such as houses, duplexes, triplexes, and 'granny flats,'" and "commercial and mixed-use buildings with parking behind or on the street." These actions have the potential to impact as yet unidentified archaeological resources within this subarea.

Jefferson Neighborhood. As within the Lowell Neighborhoods subarea, the DNCP envisions older building stock in the Jefferson Neighborhood being restored and vacant parcels infilled with house-scaled, pedestrian-oriented buildings. A new neighborhood shopping center with mixed-use, multi-story buildings would also be developed. Archaeological resources as yet unidentified could be impacted by these efforts.

Southeast Neighborhood. Under the DNCP. new neighborhood-serving commercial development may be built on principal intersections along the corridors within the Southeast Neighborhood subarea to create neighborhood centers. This development has the potential to impact yet to be discovered archaeological resources within the subarea.

South Van Ness Industrial. Construction activity associated with the adaptive reuse of pre-World War II brick warehouses as commercial, retail, residential, and mixed-use projects within the South Van Ness Industrial subarea, as proposed by the DNCP, has the potential to impact as yet undiscovered archaeological resources within the subarea.

Downtown. Potential impacts to archaeological resources within the Downtown subarea are generally associated with the extensive landscaping activity proposed for the subarea under the DNCP.

The proposed Fulton Corridor Specific Plan and Downtown Neighborhoods Community Plan will result in new development on vacant parcels and surface parking lots, as well as new development and redevelopment at underutilized sites. As described above, the Fresno Fulton Corridor Specific Plan/Downtown Neighborhoods Community Plan encompasses a wide range of historic land uses and includes areas that are highly sensitive for archaeological resources. These resources are likely to be found in a buried context within areas that have been subject to considerable long-term historic development. Future demolition and construction activities that require excavations involving the removal of foundations, excavations into previously undisturbed soils, or other activities that involve excavation or grading in areas of undisturbed soils or early historical development could result in the potential for significant impacts on archaeological resources.

As discussed above, the potential for impacts to archaeological resources exists within all subareas of both the Fulton Corridor Specific Plan and the Downtown Neighborhoods Community Plan. With regard to potential impacts, the greater the number and intensity of development projects in the area, the greater the chance for impacts on subsurface resources. As such, those subareas with a greater density of vacant or underutilized parcels – typically also the subareas with earlier historical development – would possess a greater potential for impacts on archaeological resources. The loss of archaeological resources as a result of parcel clearance or development activity within any of the Plan subareas would result in a potentially significant impact.

Identified Resources

The current review of archaeological resources failed to identify any archaeological resources that have previously been recorded within the combined Fulton Corridor/Downtown Neighborhoods Plan Areas. Two historic archaeological sites were recorded by the limited field investigations conducted for the project, both located within the FCSP area.

The Fresno Chinatown Block 50 Site is a dense surface scattering of late nineteenth and early twentieth century artifacts, including glass and ceramic fragments, leather and metal items, and building materials. The deposit appears to be principally associated with the historic occupation of the parcel by Chinese residents. Implementation of the proposed project has the potential to damage or destroy unrecorded subsurface components of this site.

Also located within the Chinatown subarea, the Fresno Block 534 Site consists of a number of structural features, all believed to relate to the development of a Penny-Newman Grain Company warehouse on the site during the early twentieth century. There are also remnants of

a railroad siding dating to the late 1800s. Implementation of the proposed project could damage or destroy unrecorded components of this site.

Additionally, one isolated archaeological feature was identified within the Southwest Fresno Neighborhoods subarea of the DNCP. The Fresno Block 1052 Concrete Pad is a structural feature thought to correspond with an early twentieth century backyard “Kitchen” indicated on historic maps. Backyard kitchens in this section of Fresno are generally associated with occupation by members of the Volga German community. This feature and related subsurface deposits in the vicinity, as yet unrecorded, could be damaged or destroyed should the proposed project be implemented.

3.2.2 Cumulative Impacts

Future development in the vicinity of the FCSP and DNCP areas could result in impacts to archaeological resources. As described above, many potential cultural resources within the proposed FCSP/DNCP areas have likely been destroyed or have lost integrity in the past due to unmonitored excavation and grading activities. To the extent that other resources with similar cultural value are lost as a result of these activities, a cumulative impact on cultural resources would occur. Additional losses attributable to the proposed Specific and Community Plans would contribute to this impact. Such losses, which as described above are considered significant Project impacts, are also considered significant in a cumulative context.

Recommended management for mitigation of impacts on archaeological resources is provided below.

4.0 Recommended Mitigation Measures

4.1 Archaeological Resources

Mitigation Measure CR-1

Cultural Resource Surveys

For any "project" (as defined by the California Environmental Quality Act) proposed within the FCSP/DNCP areas on parcels identified by this study and any subsequent studies as having a potential to contain archaeological resources (Moderate to High sensitivity for subsurface resources; refer to Appendix C), the City of Fresno shall ensure that a qualified professional archaeologist conducts an inventory study of the project site before issuing grading permits. As defined by the State Office of Historic Preservation guidelines (1991), the inventory study should include, at minimum, a search of records at the SSJV Information Center, background research to establish the development history of the property, and field investigations. Based on the findings of the preliminary research and the exiting surface conditions, fieldwork may be limited to surface inspection, or include remote sensing techniques and/or hand or mechanical testing.

If prehistoric or historic archaeological resources or potential resources are identified by the inventory study, then a qualified professional archaeologist shall evaluate the significance of the finds and recommend appropriate mitigation measures for significant resources. The City shall ensure that the project applicant implements these mitigation measures. Mitigation may include, but shall not be limited to, the avoidance of significant and potentially significant resources through alteration of the project design, archaeological monitoring of ground-disturbing activities, and/or subsurface testing and data recovery. Efforts that involve monitoring, testing, or excavation shall be conducted in consultation with the appropriate Native American representatives identified by the Native American Heritage Commission (NAHC).

All construction equipment operators will attend a pre-construction meeting presented by a professional archaeologist retained by the City to review types of cultural resources and artifacts that would be considered potentially significant, to ensure operator recognition of these materials during construction, and to emphasize reporting responsibilities.

Upon completion of the inventory study, an archaeological report will be prepared for the City in accordance with professional standards. A copy of the report will be submitted to the SSJV Information Center. Provisions will be made for curation of any significant cultural materials recovered.

Mitigation Measure CR-2

Cultural Resource Surveys for Designated Properties

An archaeological inventory study shall be conducted prior to issuance of demolition or grading permits for any project on a property with historical designation that involves ground disturbing activities.

Mitigation Measure CR-3

Monitoring in the Vicinity of Known Archaeological Sites

Monitoring by a qualified professional archaeologist shall be conducted during any ground-disturbing activities in the vicinity of the Fresno Chinatown Block 51 Site, Fresno Block 534 Site, and the Block 1052 Isolate, which were identified by the current investigations. ("Vicinity" is here defined as lying within 300 feet of the identified site boundaries.) These are presently the only archaeological sites recorded within the FCSP/DNCP areas. Ground-disturbing activities shall also be monitored in the vicinity of any archaeological sites identified in the future, as follows:

A qualified professional archaeologist and Native American representative shall monitor any ground-disturbing activities in the vicinity of known archaeological sites. An archaeological monitoring plan shall be developed in accordance with professional standards by an archaeologist who meets the Secretary of the Interior's Professional Qualifications Standards for Archaeology. The monitors will ensure that any portions of previously identified significant resources are avoided and protected. In addition, they will identify any new cultural resources encountered during ground-disturbing activities. If potentially important cultural resources are discovered, the archaeologist will immediately divert such activity within 100 feet of the find, or a distance determined to be appropriate. The potential significance of the find will be assessed and mitigation measures formulated, if warranted. Appropriate mitigation may include avoidance of the resource, testing, and/or data recovery. Ground disturbance in the area of suspended activity shall not recommence until authorized by the archaeologist.

Upon completion of the monitoring, an archaeological report will be prepared for the City in accordance with professional standards. A copy of the report will be submitted to the SSJV Information Center. Provisions will be made for curation of any significant cultural materials recovered.

Mitigation Measure CR-4

Stop Work if Cultural Resources are Discovered

The unanticipated exposing of archaeological resources has the potential to destroy or cause substantial damage to significant cultural resources. Should buried cultural resources be encountered during construction activities within the FCSP/DNCP areas, all ground-disturbing activity shall be immediately suspended within a 100-foot radius of the find until a qualified professional archaeologist, retained by the City, is contacted to evaluate the significance of the find (per CEQA regulations). Examples of such cultural materials might include shell or bone; ground stone tools such as mortars, bowls, pestles, or manos; flaked stone tools such as projectile points or scrapers; stone flakes associated with tool manufacture; historic trash deposits or scatters containing bottle glass, ceramics; or structural remains. If the archaeological resources are found to be potentially significant, impacts to the resources will be mitigated in a manner consistent with California Office of Historic Preservation (OHP) guidelines. Appropriate mitigation may include avoidance of the resources, testing, and/or data recovery. Ground disturbance in the area of suspended activity shall not recommence until authorized by the archaeologist.

Mitigation Measure CR-5

Stop Work if Human Remains are Discovered

If human remains are encountered, all ground-disturbing activities shall immediately be suspended within a 100-foot radius of the find, or a distance determined by a qualified professional archaeologist to be appropriate based on the potential for disturbance of additional remains. The Fresno County Coroner shall be contacted. If the remains are of Native American origin, the most likely descendants of the deceased must be identified by the Native American Heritage Commission (NAHC). The City of Fresno will consult with the Native American most likely descendant(s) to identify a mutually acceptable strategy for treating, with appropriate dignity, the human remains and any associated grave goods as provided in PRC Section 5097.98. If the NAHC is unable to identify a most likely descendant; if the descendant fails to make a recommendation within 24 hours of being notified by the NAHC or the City; and if the descendant is not capable of reaching a mutually acceptable strategy through mediation by the NAHC, the Native American human remains and associated grave goods will be reburied with appropriate dignity on the proposed project site in a location not subject to further subsurface disturbance.

4.2 FCSP/DNCP Impacts

With implementation of the mitigation measures identified above, impacts on archaeological resources within the FCSP/DNCP areas would be reduced to less than significant levels.

4.3 Archaeological Policy Statements

Goal: Protect archeological resources from the impacts of new development.

Intent: To ensure that archeological resources are properly identified, evaluated, and treated as warranted.

Policies

1) Require that all new development projects on archaeologically sensitive parcels (Appendix C) hire a qualified professional archaeologist to conduct a focused survey of the project site before issuing grading permits. If prehistoric or historic archaeological resources or potential resources are identified, work with a qualified professional archaeologist to evaluate the significance of the finds and recommend appropriate mitigation measures for significant resources.

2) Ensure appropriate treatment of significant archeological resources by requiring that a qualified professional archaeologist and Native American representative be present during any ground-disturbing activities in the vicinity of known sites or sensitive areas. If potentially important cultural resources are encountered, the archaeologist shall divert construction activity within 100 feet of the find, or a distance determined to be appropriate.

3) Require that all projects that encounter buried cultural resources stop all ground-disturbing activity within 100 feet of the find until a qualified professional archaeologist

identifies and assesses the find, and appropriate mitigation measures are implemented, as warranted.

4) Require that all archaeological mitigation measures for development be consistent with Office of Historic Preservation (OHP) guidelines for archeological resources.

5.0 References

Architectural Resources Group (ARG)
2006 *Germantown, Fresno: Historical Context.* ARG, San Francisco, for submission to the City of Fresno Planning and Development Department.

Armeniapedia
2011 *Fresno.* Accessed via the internet at http://www.armeniapedia.org/index. php? title=Fresno

Brady, J. L.
1985 *Stagecoaching in the San Joaquin Valley, California: 1850-1875.* Unpublished Master's Thesis, California State University, Fresno.

2004aArchaeological Survey for Telecommunication and Power Line Within Roeding Business Park Redevelopment Plan Area Fresno, California. J&R Environmental Services. Submitted to the Redevelopment Agency of the City of Fresno. On file, Southern San Joaquin Valley Archaeological Information Center, Bakersfield, California.

2004b*Archaeological and Historical Level 1 Survey of the Proposed Whites Bridge Reconstruction Project, Fresno, California.* J & R Environmental Services, Clovis.

Brady, J. L., Wendy M. Nettles and Barry A. Price
2003 *Historic Property Survey for Proposed School Site N, Fresno, California.* Prepared for Fresno Unified School District by Applied EarthWorks, Inc., Fresno, California.

Brady, J. L. and D. Supernowicz
2004 *Historic Architecture Survey Report for the "Bungalow" Court Project, Fresno, California.* Prepared for Karana Hattersley-Drayton, Historic Preservation Project Manager, City of Fresno by J&R Environmental Services (Clovis, California) and Historic Resource Associates (El Dorado Heights, California).

Bulbulian, Berge
2000 *The Fresno Armenians: History of a Diaspora Community.* California State University Press, Fresno.

California Office of Historic Preservation (OHP)
1991 *Preservation Planning Bulletin: Guidelines for Archaeological Research Designs.* No. 5, Feb. 1991. California Office of Historic Preservation, Sacramento.

Chan, Sucheng
1986 *This Bittersweet Soil: The Chinese in California Agriculture, 1860-1910.* University of California Press, Berkeley.

Clough, Charles W., and William B. Secrest Jr.
1984 *Fresno County – The Pioneer Years: From the Beginnings to 1900.* Fresno, California: Panorama West Books.

Clough, Charles W., William B. Secrest, Bobbye Sisk Temple, Fresno City and County Historical Society
1986 *Fresno County in the 20th Century, from 1900 to the 1980s.* Panorama West Books, Fresno.

Downtown Association of Fresno (DAF)
2011 *Downtown Districts*. Electronic document, http://www.downtownfresno.org/districts. html, accessed June 13, 2011.

Eaton, Edwin M.
1965 Vintage Fresno – Pictorial Recollections of a Western City. Fresno: The Huntington Press.

Elliott, Wallace W.
1882 *History of Fresno County, California.* Wallace W. Elliott & Company, San Francisco. Reprinted by Valley Publishers, Fresno, 1973.

Fisher, Jim
1994 *Historical Architectural Survey Report for Proposed Construction of Route 180 from Brawley Avenue to Thorne Avenue in the City of Fresno*. California Department of Transportation, Environmental Division. Submitted to California Department of Transportation. On file, Southern San Joaquin Valley Archaeological Information Center, Bakersfield, California.

Fredrickson, David A.
1964 *Preliminary Impressions on the Archaeology of Ker-116*. Submitted to California Department of Parks and Recreation.

Fresno Bee
1962 "Fresno's Chinatown was a Busy Bustling Section." *The Fresno Bee*, May 22, no pg.

Fresno, City of
1999 *Municipal Code, Historic Preservation Ordinance.* City of Fresno.

2011 *City of Fresno Interactive Mapping.* Accessible at http://gis4u.fresno.gov/viewer/

Fresno, City of, Public Utilities Dept.
2011 *Wastewater Plant History*. Accessible at http://www.fresno.gov/Government/DepartmentDirectory/PublicUtilities/Wastewater/AboutWastewater/WastewaterPlant History.htm

2012 *Historic Overview & Facts: Fresno's Water History.* Accessible at http://www.fresno.gov/Government/DepartmentDirectory/PublicUtilities/Watermanagement/WaterInformation/HistoricalOverviewandFacts/Default.htm

Gallup, Aaron
1991 *Supplemental Historic Architecture Survey Report for Highway 41 Construction in the City of Fresno.* Caltrans District 3, Sacramento. On file, City of Fresno Planning Department.

Galvin Preservation Associates, Inc. (GPA)
2008 *City of Fresno North Park Survey: Historic Context & Survey Report.* Prepared for submission to the City of Fresno Planning and Development Department. Galvin Preservation Associates, Inc., Redondo Beach, CA.

Golston, Jacalyn
1980 "The Germans: From Russia They Came." *The Fresno Bee*. Feb. 10, no pg.

Gudde, Erwin G.
1969 *California Place Names; the Origin and Etymology of Current Geographical Names.* University of California Press, Berkeley.

Hamm, Edward, Jr.
1979 *When Fresno Rode the Rails: Trolleys of the San Joaquin.* Interurbans Publications, Glendale, CA.

Hayk
2009 *Armenians in Fresno, CA*. Internet website: http://www.hayk.net/destinations/ fresno-ca/, accessed June 14, 2011.

Hartzell, Leslie
1992 *Hunter-gatherer adaptive strategies and lacustrine environments in the Buena Vista Lake Basin, Kern County, California.* Unpublished dissertation. University of California, Davis, California.

Hatoff, Brian, D. Livingstone, and M. St. Clair
2005 *Hope VI – Yosemite Village Project Site, Archaeological Survey, County of Fresno*. URS Corporation. Submitted to Housing Authority of the City of Fresno, California. On file, Southern San Joaquin Valley Archaeological Information Center, Bakersfield, California.

Hewes, Gordon W.
1941 Reconnaissance of the Central San Joaquin Valley. *American Antiquity* 7(2): 123-133.

Leach-Palm, Laura, Jeffrey Rosenthal, Brian F. Byrd, Pat Mikkelsen, and Sharon Waechter
2006 *Preliminary Assessment of Archaeological Sensitivity for the Route 180 Westside Expressway Route Adoption Study Between Interstate 5 and the City of Fresno, Fresno County, California*. Far Western Anthropological Research Group, Inc. Submitted to California Department of Transportation. On file, Southern San Joaquin Valley Archaeological Information Center, Bakersfield, California.

Nelson, Wendy J.
2000 *Cultural Resources Survey for the Level (3) Communications Long Haul Fiber Optics Project, Segment WS04: Sacramento to Bakersfield.* Far Western Anthropological Research Group, Inc., Davis, CA.

Nettles, Wendy M.
2004 *Historic Property Survey for Fresno Unified School District Proposed West Fresno Middle School in Fresno County, California.* Applied Earthworks, Inc., Fresno.

Moratto, Michael J. (editor)
1984 *California Archaeology*. Academic Press, Orlando, Florida.

Moule & Polyzoides
2011a*Downtown Neighborhoods Community Plan, Fresno California.* Public Draft, September 23. Moule & Polyzoides, Pasadena, CA. Accesses via http://fresnodown townplans.com/project/details/dncp

2011b*Fulton Corridor Specific Plan, Fresno California.* Public Draft, October 14. Moule & Polyzoides, Pasadena, CA. Accesses via http://fresnodowntownplans.com/project/ details/fcsp

Munz, Philip A., and David D. Keck
1973 *A California Flora, and Supplement.* University of California Press, Berkeley.

National Park Service
2004 *Five Views: An Ethnic Historic Site Survey for California*. Electronic document, http://www.cr.nps.gov/history/online_books/5views/5views3.htm, accessed June 14, 2011.

Panter, John
1994 "Central California Colony: Marvel of the Desert." *Fresno Past & Present*, Vol. 36, No. 2 (Summer 1994). Fresno City and County Historical Society.

Pavlik, Robert C.
1995 *Supplemental Historic Architectural Survey Report / Historic Property Survey Report for Highway Construction in the City and County of Fresno, California.* California Department of Transportation, Office of Environmental Management. Submitted to Department of Transportation, Office of Environmental Management. On file, Southern San Joaquin Valley Archaeological Information Center, Bakersfield, California.

Thickens, Virginia E.
1946 "Pioneer Agricultural Colonies of Fresno County," in *California Historical Society, Quarterly*, 25: 17-38 (March 1946).

Thompson, Thomas H.
1891 *Atlas Map of Fresno County, California, with Illustrations.* Thomas H. Thompson, Tulare, California.

Vandor, Paul E.
1919 *History of Fresno County California with Biographical Sketches of the Leading Men and Women of the County Who Have Been Identified with Its Growth and Development from the Early Days to the Present.* Los Angeles: Historic Record Company.

Wallace, William J.
1978 Northern Valley Yokuts. In *Handbook of North American Indians*, vol. 8, edited by Robert F. Heizer, pp. 462-470. Smithsonian Institution, Washington, D.C.

Warren, Claude N., and Marshall B. McKusick
1959 A Burial Complex from the Southern San Joaquin Valley. *Archaeological Survey Annual Report* 1959:17-26. University of California, Los Angeles, California.

Wedel, Waldo R.
1941 *Archaeological Investigations at Buena Vista Lake, Kern County, California*. Bureau of American Ethnology Bulletin, Washington, D.C.

Maps Consulted

Sanborn Map & Publishing Company
1885a *Fresno, California.* (Jan. 1885)
1885b *Fresno, California.* (July 1885)
1888 *Fresno, California.*

Sanborn-Perris Map Company
1898 *Insurance Maps of Fresno, California.*
1906 Wilmington, Los Angeles County, California.

Sanborn Map Company
1906 *Insurance Maps of Fresno, California.*
1918-1919 *Insurance Maps of Fresno, California.*
1919-1948 *Insurance Maps of Fresno, California.*
1919-1950 *Insurance Maps of Fresno, California.*

United States Geological Survey (USGS)
1923 Bullard, California Quadrangle, 7.5 Minute Series
1923 Clovis, California Quadrangle, 7.5 Minute Series
1923 Fresno, California Quadrangle, 7.5 Minute Series
1923 Malaga, California Quadrangle, 7.5 Minute Series

Klein, L. W.
1901 *Fresno, California.* Bird's eye view printed by Britton & Rey, San Francisco.

APPENDIX A

Native American Consultation

GREENWOOD AND ASSOCIATES
725 JACON WAY
PACIFIC PALISADES, CALIFORNIA 90272
(310) 454-3091

April 13, 2011

Mr. Larry Myers, Executive Secretary
Native American Heritage Commission
915 Capitol Mall, Room 364
Sacramento, California 95814

Subject: Sacred Lands File Search for the Fresno Fulton Corridor and Downtown Neighborhoods Specific Plan EIR/EIS Project, City of Fresno, Fresno County, California

Dear Mr. Myers:

Attached please find USGS Clovis, Malaga, Fresno South, and Fresno North, CA 7.5 minute topographic quadrangle maps providing the location of the Fresno Fulton Corridor and Downtown Neighborhoods Specific Plan EIR/EIS Project, in the City of Fresno, Fresno County, California. The City of Fresno Downtown and Community Revitalization Department, as lead agency for the project, has initiated an environmental documentation process. Encompassing a 400-567+/- acre area, the Specific Plan will function as a City planning and zoning document, as well as a public information tool for the development community and the community at large.

Please advise us of any Traditional Cultural Properties (TCPs) and/or sacred sites that may be impacted by development within the Specific Plan project area. We are also requesting a list of Native American individuals or groups that may have concerns for this area.

Thank you very much for your assistance. If you have any questions or comments, please call me at (310) 454-3091.

Sincerely,

Dana Slawson

Dana N. Slawson, M.A.
Greenwood and Associates

Attachments:
- Project Location Map
- USGS Clovis, Malaga, Fresno South, and Fresno North, CA maps

Fresno County

STATE OF CALIFORNIA Edmund G. Brown, Jr., Governor

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-6251
Fax (916) 657-5390
Web Site www.nahc.ca.gov
ds_nahc@pacbell.net

April 22, 2011

Ms. Dana N. Slawson
GREENWOOD & ASSOCIATES
725 Jacon Way
Pacific Palisades, CA 90272

Sent by FAX to: 310-454-3091
No. of Pages: 5

Re: Request for a Sacred Lands File Search and Native American Contacts list for the **"Fulton Corridor and Downtown Neighborhoods Specific Plan cEQA Environmental Impact Report / federal NEPA Environmental Impact Statement (EIR/EIS);"** located in four USGS Quadrangles in the southern, northern and eastern sectors of the City of Fresno; County, California

Dear Ms. Slawson:

The Native American Heritage Commission (NAHC), the State of California 'Trustee Agency' for the protection and preservation of Native American cultural resources. The NAHC Sacred Lands File search results indicated that Native American cultural resources **were identified** within ½ mile of the areas of potential effect (e.g. APEs), the Malaga and Fresno South USGS Quadrangles. We also have a question regarding your request: Is Greenwood & Associates contracted by the City of Fresno to do SB 18 'government-to-government' consultation pursuant to California Government Code §§65352.3 and 65352.4? If so, the consultation requirements differ somewhat from those provided for under California and federal environmental review policies. Please respond to the foregoing question by contacting me at (916) 653-6251. The following is a response to your request strictly as provided for under California CEQA and federal NEPA.

The California Environmental Quality Act (CEQA – CA Public Resources Code §§ 21000-21177, amendments effective 3/18/2010) requires that any project that causes a substantial adverse change in the significance of an historical resource, that includes archaeological resources, is a 'significant effect' requiring the preparation of an Environmental Impact Report (EIR) per the CEQA Guidelines defines a significant impact on the environment as 'a substantial, or potentially substantial, adverse change in any of physical conditions within an area affected by the proposed project, including ...objects of historic or aesthetic significance." In order to comply with this provision, the lead agency is required to assess whether the project will have an adverse impact on these resources within the 'area of potential effect (APE), and if so, to mitigate that effect. CA Government Code §65040.12(e) defines "environmental justice" provisions and is applicable to the environmental review processes.

Early consultation with Native American tribes in your area is the best way to avoid unanticipated discoveries once a project is underway. Culturally affiliated tribes and individuals may have knowledge of the religious and cultural significance of the historic properties in the project area (e.g. APE). Consultation with Native American communities is also a matter of environmental justice as defined by California Government Code §65040.12(e). We urge

consultation with those tribes and interested Native Americans on the list of Native American Contacts we attach to this letter in order to see if your proposed project might impact Native American cultural resources. Lead agencies should consider avoidance as defined in §15370 of the CEQA Guidelines when significant cultural resources as defined by the CEQA Guidelines §15064.5 (b)(c)(f) may be affected by a proposed project. If so, Section 15382 of the CEQA Guidelines defines a significant impact on the environment as "substantial."

Furthermore we suggest that you contact the California Historic Resources Information System (CHRIS) for pertinent archaeological data within or near the APE, at the California Office of Historic Preservation (916) 446-7000.

Consultation with tribes and interested Native American consulting parties, on the NAHC list, should be conducted in compliance with the requirements of federal NEPA (42 U.S.C 4321-43351) and Section 106 and 4(f) of federal NHPA (16 U.S.C. 470 *et seq*), 36 CFR Part 800.3 (f) (2) & .5, the President's Council on Environmental Quality (CSQ, 42 U.S.C 4371 *et seq.* and NAGPRA (25 U.S.C. 3001-3013) as appropriate. The 1992 *Secretary of the Interiors Standards for the Treatment of Historic Properties* were revised so that they could be applied to all historic resource types included in the National Register of Historic Places and including cultural landscapes. Also, federal Executive Orders Nos. 11593 (preservation of cultural environment), 13175 (coordination & consultation) and 13007 (Sacred Sites) are helpful, supportive guides for Section 106 consultation.

Also, California Public Resources Code Section 5097.98, California Government Code §27491 and Health & Safety Code Section 7050.5 provide for provisions for accidentally discovered archeological resources during construction and mandate the processes to be followed in the event of an accidental discovery of any human remains in a project location other than a 'dedicated cemetery'.

To be effective, consultation on specific projects must be the result of an ongoing relationship between Native American tribes and lead agencies, project proponents and their contractors, in the opinion of the NAHC. Regarding tribal consultation, a relationship built around regular meetings and informal involvement with local tribes will lead to more qualitative consultation tribal input on specific projects.

The response to this search for Native American cultural resources is conducted in the NAHC Sacred Lands Inventory, established by the California Legislature (CA Public Resources Code 5097.94(a) and is exempt from the CA Public Records Act (c.f. California Government Code 6254.10) although Native Americans on the attached contact list may wish to reveal the nature of identified cultural resources/historic properties. Confidentiality of "historic properties of religious and cultural significance" may also be protected under Section 304 of he NHPA or at the Secretary of the Interior discretion if not eligible for listing on the National Register of Historic Places. The Secretary may also be advised by the federal Indian Religious Freedom Act (cf. 42 U.S.C., 1996) in issuing a decision on whether or not to disclose items of religious and/or cultural significance identified in or near the APE and possibility threatened by proposed project activity.

If you have any questions about this response to your request, please do not hesitate to contact me at (916) 653-6251.

Sincerely,

Dave Singleton
Program Analyst

Attachment: Native American Contact List

Native American Contact List
Fresno County
April 22, 2011

Table Mountain Rancheria
Bob Pennell, Cultural Resources Director
P.O. Box 410 Yokuts
Friant , CA 93626-0177
(559) 325-0351
(559) 217-9718 - cell
(559) 325-0394 FAX

Chowchilla Tribe of Yokuts
Jerry Brown
10553 N. Rice Road North Valley Yokuts
Fresno , CA 93720
559-434-3160

Kings River Choinumni Farm Tribe
John Davis, Chairman
1064 Oxford Avenue Foothill Yokuts
Clovis , CA 93612-2211 Choinumni
(669) 307-6430

The Choinumni Tribe of Yokuts
Rosemary Smith, Chairperson
1505 Barstow Choinumni
Clovis , CA 96311 Foothill YoKut
monoclovis@yahoo.com
559-862-5757

Dunlap Band of Mono Historical Preservation Soc
Mandy Marine, Board Chairperson
P.O Box 18 Mono
Dunlap , CA 93621
mandy_marine@hotmail.com
559-274-1705
559-252-0198 - fax

Traditional Choinumni Tribe
David Alvarez, Chairperson
2415 E. Houston Avenue Choinumni
Fresno , CA 93720
davealvarez@sbcglobal.net
(559) 323-6231
(559) 292-5057 FAX

Dumna Wo-Wah Tribal Government
Jim Redmoon - Cultural Resources Representative
724 W. Fountain Dumna/Foothill
Fresno , CA 93705 Choinumni
559-824-0265
redmoonrising@att.net
559-243-9926 -home

Santa Rosa Tachi Rancheria
Lalo Franco, Cultural Coordinator
P.O. Box 8 Tachi
Lemoore , CA 93245 Tache
(559) 924-1278 Yokut
(559) 924-3583

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of the statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources for the proposed Fresno Fulton Corridor and Downtown Neighborhoods Specific Plan EIR/EIS Project; located in the City of Fresno; Fresno County, California for which a Sacred Lands File search and Native American Contacts were requested for thiese projects as required by the California Environmental Quality Act (CEQA) and the federal National Environmental Policy Act (NEPA).

Native American Contact List
Fresno County
April 22, 2011

Big Sandy Rancheria of Mono Indians
Liz Hutchins Kipp, Chairperson
P.O. Box 337 / 37302 Western Mono
Auberry , CA 93602
(559) 855-4003
ck@bigsandyrancheria.com
(559) 855-4129 Fax

Table Mountain Rancheria
Lee Ann Walker Grant, Chairperson
P.O. Box 410 Yokuts
Friant , CA 93626-0177
(559) 822-2587
(559) 822-2693 FAX

Cold Springs Rancheria of Mono Indians
Robert Marquez, Chairperson
P.O. Box 209 Mono
Tollhouse , CA 93667
(559) 855-5043
559-855-4445 - FAX

Dumna Wo-Wah Tribal Goverment
Keith F. Turner, Tribal Contact
P.O. Box 306 Dumna/Foothill
Auberry , CA 93602 Mono
t'si-akimcorr@at.net
(559) 855-3128 Home
(559) 696-0191 (Cell)

North Fork Mono Tribe
Ron Goode, Chairperson
13396 Tollhouse Road Mono
Clovis , CA 93619
eagleeye@cuip.net
(559) 299-3729 Home

Sierra Nevada Native American Coalition
Lawrence Bill, Interim Chairperson
P.O. 125 Mono
Dunlap , CA 93621 Foothill Yokuts
(559) 338-2354 Choinumni

Santa Rosa Rancheria
Rueben Barrios, Chairperson
P.O. Box 8 Tache
Lemoore , CA 93245 Tachi
(559) 924-1278 Yokut
(559) 924-3583 Fax

Choinumni Tribe; Choinumni/Mono
Lorrie Planas
2736 Palo Alto Choinumni
Clovis , CA 93611 Mono

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of the statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources for the proposed Fresno Fulton Corridor and Downtown Neighborhoods Specific Plan EIR/EIS Project; located in the City of Fresno; Fresno County, California for which a Sacred Lands File search and Native American Contacts were requested for those projects as required by the California Environmental Quality Act (CEQA) and the federal National Environmental Policy Act (NEPA).

Greenwood and Associates
725 Jacon Way
Pacific Palisades, CA 90272
(310) 454-3091

April 27, 2011

Table Mountain Rancheria
Mr. Bob Pennell, Cultural Resources Director
P.O. Box 410
Friant, CA 93626-0177

Re: Fresno Fulton Corridor and Downtown Neighborhoods Specific Plan EIR/EIS Project, City of Fresno, Fresno County, California

Dear Mr. Pennell,

Greenwood and Associates is preparing an archaeological research report that will meet current archaeological standards and be in compliance with relevant State and Federal cultural resource guidelines. The project, for the City of Fresno Downtown and Community Revitalization Department, encompasses a 567+/- acre area of the city. The Specific Plan will function as a City planning and zoning document, as well as a public information tool for the development community and the community at large. The Specific Plan project area takes in portions of four topographic quadrangle maps. Sections of these maps with the project area indicated have been included for your review (USGS 7.5' Fresno North, Fresno South, Malaga, and Clovis, CA quadrangles).

If you have knowledge of any unrecorded sites or special concerns for this area, we will gladly include your comments in our report.

Thank you for your time and attention to this request. Please feel free to contact me at 310.454.3091, or dslawson@greenwood-associates.com should you have any questions.

Sincerely,

Dana Slawson

Dana N. Slawson, M.A.
Project Manager

TABLE MOUNTAIN RANCHERIA
TRIBAL GOVERNMENT OFFICE

June 16, 2011

Greenwood and Associates
Dana N. Slawson, M.A.,
Project Manager
725 Jacon Way
Pacific Palisades, Ca. 90272

RE: Fresno Fulton Corridor and Downtown Neighborhoods Specific Plan EIR/EIS Project, City of Fresno, Fresno County, California

Dear Dana N. Slawson:

This is in response to your letter dated April 27, 2011, regarding the, Fresno Fulton Corridor and Downtown Neighborhoods Specific Plan EIR/EIS Project, City of Fresno, Fresno County, California. Thank you for notifying us of the potential development and the request for consultation.

We decline participation at this time but would appreciate being notified in the unlikely event that cultural resources are identified.

Sincerely,

Bob Pennell,
Tribal Cultural Resources Director
559.325.0351

Leanne Walker-Grant
Tribal Chairperson

Brenda D. Lavell
Tribal Vice-Chairperson

Craig Martinez
Tribal Secretary/Treasurer

Ray Barnes
Tribal Council Member

John L. Burrough
Tribal Council Member

23736
Sky Harbour Road
Post Office
Box 410
Friant
California
93626
(559) 822-2587
Fax
(559) 822-2693

From: David Alvarez (davealvarez@sbcglobal.net)
To: dslawson@greenwood-associates.com;
Date: Thu, June 2, 2011 2:26:14 PM
Cc:
Subject: re: Fresno Fulton Corridor and Downtown Neighborhoods Specific Plan EIR/EIS Project, City of Fresno, Fresno County, California

Hello Dana
I apologize for the delay in responding to your letter regarding the **Fresno Fulton Corridor and Downtown Neighborhoods Specific Plan EIR/EIS Project, City of Fresno, Fresno County, California.**
The said area on the maps and street locations is out of our Historical Land Base. I do not for see an issue with cultural artifacts or remains. In the event that artifacts or remains are discovered, I only ask that the proper entities are notified. Should you have any questions, please send me an email or phone call.

Regards,

David Alvarez, Tribal Chairman
Traditional Choinumni Tribe
(East of the Kings River)
2415 E. Houston, Ave.
Fresno, CA. 93720
559.323.6231
davealvarez@sbcglobal.net

APPENDIX B

Archaeological Site Records

Confidential - Not For Public Review

APPENDIX C

Block-by-Block Archival Research Summary

FULTON CORRIDOR SPECIFIC PLAN AREA

Block Ref	Block Boundaries	San Blk	Historical Development	Current Conditions	Archaeological Sensitivity
1	Santa Clara, Golden State, Ventura, E S	33E	1885-1: NA; 1885-2: NA; 1888: NA	Undeveloped - 99 ramp median	Mod N 1/2 (D)
2	Ventura, Golden State, (Mono), E St.	32E	1885-1: NA; 1885-2: NA; 1888: NA	Development NE cr only, + 99 r	High - 19th/e 20thC D along E St.
3	(Mono), Rte 99, (Inyo), E St.	31E	1885-1: NA; 1885-2: NA; 1888: 3-f	Development N 1/3 only, paved	High - D/O/A fronting E St.
4	(Inyo), Rte 99, Kern, E St.	30E	1885-1: NA; 1885-2: NA; 1888: 2-f	Development on 1/2, paved pkg	Mod-High (D and Japan/Mex Ch)
5	Kern, Rte 99, Tulare, E St.	29E	1885-1: 1sty fr Sal., dwgs NE cr.[cl	Devel. along E St, 99 ramp berr	Low-Mod (potential for FB/S/L on W 1/2)
6	Tulare, Rte 99 ramp, Mariposa, E St.	28E	1885-1: 1 sty fr dwgs NE, SE crs [c	Devel. on N 1/2 + 99 ramp berm	Mod - 20thC D/S
7	Mariposa, Rte 99 ramp, Fresno, E St.	27E	1885-1: NA; 1885-2: NA; 1888: NA	Devel at S end, paved pkg	Mod - 20thC gas/gar + factory, N 1/2
8	Fresno, Rte 99 ramp, Merced, E St.	26E	1885-1: NA; 1885-2: NA; 1888: 2-f	Devel on 1/4 of blk, remainder p	Mod - 20thC D/S/WaHo
9	Merced, Rte 99 feeder, Tuolumne, E St.	25E	1885-1: NA; 1885-2: NA; 1888: 3-f	Devel on 1/2+. paved pkg	Mod - 20thC D/S along E St
10	Tuolumne, Rte 99 feeder, Stanislaus, E	24E	1885-1: NA; 1885-2: NA; 1888: NA	Devel on 1/3+, paved pkg	Mod - 20thC D N and S ends
11	Stanislaus, Rte 99, Cavaveras, E St.	23E	1885-1: NA; 1885-2: NA; 1888: NA	Devel on 1/2+. paved pkg	Low-Mod 20thC D/O
12	E St, Santa Clara, Fagan Al	228W	1885-1: NA; 1885-2: NA; 1888: NA	No devel	Mod - 20th D D/O
13	Santa Clara, E St, Ventura, Fagan Al	34W	1885-1: NA; 1885-2: NA; 1888: NA	SFD devel on S 2/3, 1/3 vacant	Mod-High 19th/e 20thC D/O
14	Ventura, E St, Mono, Fagan Al	35W	1885-1: Distillery w/ Stm Eng; 188	No devel, paved/grl pkg	Mod-High e20thC D/S/O whole blk
15	Mono, E St, Inyo, Fagan Al	36W	1885-1:Vac; 1885-2: NA; 1888: 2-f	Devel entire blk	Low - post 1948 industl. devel entire blk
16	Inyo, E St, Kern, Fagan Al	37W	1885-1: NA; 1885-2: NA; 1888: Va	Mod devel on 1/2 blk, paved pk	Mod - pre 1948 brk commercial N end
17	Kern, E St, Tulare, Fagan Al	38W	1885-1: NA; 1885-2: NA; 1888: NA	Devel on 1/3, 2/3 pvd pkg/open	Mod-High 19th/e 20thC FB/S/D (Chin/Japan)
18	Tulare, E St, Mariposa, Fagan Al	39W	1885-1: NA; 1885-2: NA; 1888: NA	Mod S on 1/3 + open + pvd CH	Mod-High 19th/e 20thC FB/S/D (Chin/Japan)
19	Mariposa, E St, Fresno, Fagan Al	40W	1885-1: NA; 1885-2: NA; 1888: NA	Devel on 1/3 + pvd pkg	Mod - 19/20thC D/Inst
20	Fresno, E St, (Merced), (Fagan Al)	41W	1885-1: NA; 1885-2: NA; 1888: 1-f	Devel on 1/2 + pvd pkg	Mod-High - 20thC Indstl-Comm/D
21	(Merced), E St, Tuolumne, (Fagan Al)	42W	1885-1: NA; 1885-2: NA; 1888: 1-f	Devel on 1/6 + pvd pkg	Mod-High - 19/20thC D/S
22	Tuolumne, E St, Stanislaus, Fagan Al	43W	1885-1: NA; 1885-2: NA; 1888: NA	Devel on 1/2, remainder pvd pk	Low- post 1948 indstl/comm devel+pkg
23	Stanislaus, E St, Calaveras, (Fagan Al)	44W	1885-1: NA; 1885-2: NA; 1898: NA	Devel on 1/2 + pvd pkg	Low-Mod - e20thC D
24	San Benito, Fagan Al, Santa Clara, F St	228E	1885-1: NA; 1885-2: NA; 1888: NA	Devel on 2/3 + pvd pkg	Low - post 1948 res/comm devel
25	Santa Clara, Fagan, Ventura, F St	34E	1885-1: NA; 1885-2: NA; 1888: NA	Old res devel on 1/3	Mod - e20thC D
26	Ventura, Fagan, Mono, F St	35E	1885-1: 1 sty fr off. NW cr; 1885-2	Devel on all	Low - covered by indstl bldg
27	Mono, Fagan, Inyo, F St	36E	1885-1: 1 sty Ice Works w/brk stm	Devel on all	Low - covered by indstl bldgs
28	Inyo, Fagan, Kern, F St	37E	1885-1: NA; 1885-2: NA; 1888: NA	Mod S on 1/3 + pvd pkg CHIN	Mod-High for 19th/e20thC S/FB/L/D
29	Kern, Fagan, Tulare, F St	38E	1885-1: 1 sty Sal., dwgs NE cr; 18	p1920 S on 1/2 + pvd pkg CHI	Mod-High for 19th/e20thC S/L/FB/O
30	Tulare, Fagan, Mariposa, F St	39E	1885-1: 1 sty Sal., dwgs SE cr; 18	p1920/p1950 S on 1/3 + pvd + c	Mod-High for 19th/e20thC S/L/D/FB
31	Mariposa, Fagan, Fresno, F St	40E	1885-1: NA; 1885-2: NA; 1888: 2-f	Devel on 1/2 + paved pkg, oper	Mod-High 19th/20thC D/S
32	Fresno, Fagan, Merced, F St	41E	1885-1: NA; 1885-2: NA; 1888: 6-f	DEvel on 2/3 + paved pkg	Low-Mod for e 20thC S/D
33	Merced, Fagan, Tuolumne, F St	42E	1885-1: NA; 1885-2: NA; 1888: 5-f	Devel on 1/4 + paed pkg	Mod for 19th-e20 C D
34	Tuolumne, Fagan, Stanislaus, F St	43E	1885-1: NA; 1885-2: NA; 1888: NA	Devel on 1/2 + pavde pkg	Low-Mod for 19th/e 20thC S/D
35	Stanislaus, Fagan, Calaveras, F St	44E	1885-1: NA; 1885-2: NA; 1888: NA	Devel on 3/4 + paved pkg	Low for e 20thC D/Ch
36	Golden St Blvd (Monterey), (F St), San E	221W	1885-1: NA; 1885-2: NA; 1888: NA	Devel on 3/4	Low for 19th/e 20thC D
37	San Benito, F St, Santa Clara, China	220W	1885-1: NA; 1885-2: NA; 1888: NA	Devel on 2/3 + paved pkg	Low for 19th/e 20thC D/S

38	Santa Clara, F St, Ventura, China	55W	1885-1: NA; 1885-2: NA; 1888: NA	Devel on 1/8, open		Mod-High for 19th/e 20thC D
39	Ventura, F St, Mono, China	54W	1885-1: 1-frD, 1-frO; 1885-2: 1-frD	Devel on 1/2		Mod for 19th-e20 C D/S
40	Mono, F St, Inyo, China	53W	1885-1: NA; 1885-2: NA; 1888: 3-f	Devel on 1/4 + paved pkg		Mod-High for 19th/e 20thC D/S
41	Inyo, F St, Kern, China	52W	1885-1: NA; 1885-2: NA; 1888: -fr	p1950 S/L on 2/3 + pvd	CHINA	Low-Mod for 19th/e20thC D/Brn
42	Kern, F St, Tulare, China	51W	1885-1: 1 sty fr dwgs/Sals. N end;	p1920/p1950 S/D on 3/4 + pvd		Low-Mod for 19th/e20th S
43	Tulare, F St, Mariposa, China	50W	1885-1: 1 sty fr dwgs thruout (Chin	p1920 S on 1/4 + pvd + open	(	Mod-High for 19th/e 20thC D/S/Inds
44	Mariposa, F St, Fresno, China	49W	1885-1: NA; 1885-2: NA; 1888: 1-f	Devel on 1/2 + paved pkg		Low-Mod for 19th-e20thC S/Utility
45	Fresno, F St, Merced, China	48W	1885-1: NA; 1885-2: NA; 1888: 3-f	Devel on 1/2 + paved		Low-Mod for 19th-e20thC D/S
46	Merced, F St, Tuolumne, China	47W	1885-1: NA; 1885-2: NA; 1888: 2-f	Devel on 1/2 + paved		Low-Mod for 19th-e20thC D/S
47	Tuolumne, F St, Stanislaus, China	46W	1885-1: NA; 1885-2: NA; 1888: NA	Devel on 3/4 + paved		Low for 19th-e20thC D
48	Stanislaus, F St, Calaveras, China	45W	1885-1: NA; 1885-2: NA; 1888: NA	Devel on 3/4 + paved		Low for 19th-e20thC D/S
49	Rte 41, China, Monterey, G St	222E	1885-1: NA; 1885-2: NA; 1888: NA	Devel (fwy) on 1/2, remainder o		Low for 19th-e20thC D
50	Monterey, China, Benito, G St	221E	1885-1: NA; 1885-2: NA; 1888: NA	Devel on 2/3 + paved		Low-Mod for 19th-e20thC D/S
51	Benito, China, Santa Clara, G St	220E	1885-1: NA; 1885-2: NA; 1888: NA	Devel on 3/4 + paved		Low for 19th-e20thC D/S
52	Santa Clara, China, Ventura, G St	55E	1885-1: NA; 1885-2: NA; 1888: NA	Devel on 1/2 + paved		Low for 19th-e20thC D
53	Ventura, China, Mono, G St	54E	1885-1: 1-frD, 1-frS, 2-frO; 1885-2	Devel on 1/3 + paved		Low-Mod for 19th-e20thC D/S
54	Mono, China, Inyo, G St	53E	1885-1: NA; 1885-2: NA; 1888: 2-f	Devel on 1/2, remainder open		Mod for 19th-e20thC D/S
55	Inyo, China, Kern, G St	52E	1885-1: NA; 1885-2: NA; 1888: -fr	p1906 S on 1/4 + open	CHINA	Mod-High for 19th/e 20thC L/S
56	Kern, China, Tulare, G St	51E	1885-1: 1-2 sty fr com. + dwgs on	Mod S on 1/3 + pvd	CHINATO	High for 19th-e20thC S
57	Tulare, China, Mariposa, G St	50E	1885-1: 1-2 sty fr com. + dwgs thr	p1920 S on 1/8 + open	CHINA	High for 19th-e20thC S
58	Mariposa, China, Fresno, G St	49E	1885-1: NA; 1885-2: NA; 1888: NA	Devel on 1/3 + paved, open		Mod for 19th-e20thC S
59	Fresno, China, Merced, G St	48E	1885-1: NA; 1885-2: NA; 1888: 6-f	Devel on 1/2 + paved		Mod for 19th-e20thC S
60	Merced, China, Tuolumne, G St	47E	1885-1: NA; 1885-2: NA; 1888: 3-f	Devel on 2/3 + paved		Low-Mod for 19th-e20thC D/S
61	Tuolumne, China, Stanislaus, G St	46E	1885-1: NA; 1885-2: NA; 1888: NA	Devel on 1/4 + paved pkg		Mod for 19th-e20thC D/S/Ch
62	Stanislaus, China, Calaveras, G St	45E	1885-1: NA; 1885-2: NA; 1888: NA	Devel on 1/2 + paved		Low-Mod for 19th-e20thC D/S
63	Monterey, G St, Benito,UPRR	539	1885-1: NA; 1885-2: NA; 1888: NA	Devel on 1/4 + paved + open		Mod-High for 19th-e20thC D, 20thC Inds
64	Benito, G St, Santa Clara, UPRR	538	1885-1: NA; 1885-2: NA; 1888: NA	No devel - paved + open		High for 19th-e20thC Inds
65	Santa Clara, G St, Ventura, UPRR	537	1885-1: NA; 1885-2: NA; 1888: NA	No devel - paved + open		High for 19th-e20thC Inds
66	Ventura, G St, Mono, UPRR	536	1885-1: NA; 1885-2: NA; 1888: NA	No devel - paved + open		High for 19th-e20thC Inds
67	Mono, G St, Inyo, UPRR	535	1885-1: NA; 1885-2: NA; 1888: NA	Devel on 1/3 + open		High for 19th-e20thC Inds
68	Inyo, G St, Kern, UPRR	534	1885-1: NA; 1885-2: NA; 1888: 1-f	Devel on 1/4 + open		High for 19th-e20thC Inds
69	Kern, G St, Tulare, UPRR	533	1885-1: 3-frO; 1885-2: 3-frO; 1888	Devel on all		Low for 19th-e20thC Inds
70	Tulare, G St, Mariposa, UPRR	532	1885-1: 1-frInds, 3-frO; 1885-2: 1-f	No devel - paved + open		Mod-High for 19th-e20thC D/Inds/RRtr
71	Mariposa, G St, Fresno, UPRR	531	1885-1: 1-frS; 1885-2: 1-frS; 1888:	Devel on 1/2 + paved, open		Mod for 19th-e 20thC Inds/RRtr
72	Fresno, G St, Merced, UPRR	530	1885-1: NA; 1885-2: NA; 1888: NA	Devel on 1/3 + paved, open		Mod for 19th-e 20thC Inds/RRtr
73	Merced, G St, Toulumne, UPRR	529	1885-1: NA; 1885-2: NA; 1888: NA	Devel on 1/2 + paved + open		Mod for 19th-e 20thC Inds/RRtr
74	Toulumne, G St, Stanislaus, UPRR	528	1885-1: NA; 1885-2: NA; 1888: NA	Devel on 1/3 + paved + open		Mod for 19th-e 20thC D/Inds/RRtr
75	Stanislaus, G St, Calaveras, UPRR	527	1885-1: NA; 1885-2: NA; 1888: NA	Devel on 1/4 + paved + open		Mod for 19th-e 20thC D/Inds/RRtr
76	Monterey, UPRR, Benito, H St	519	1885-1: NA; 1885-2: NA; 1888: NA	Devel on 1/2 + paved + open		Low-Mod for 19th-e 20thC Inds/RRtr
77	Benito, UPRR, Santa Clara, H St	518	1885-1: NA; 1885-2: NA; 1888: NA	No devel, paved + open		Mod for 19th-e 20thC Inds
78	Santa Clara, UPRR, Ventura, H St	517	1885-1: NA; 1885-2: NA; 1888: NA	Devel on 1/2 + paved		Mod for 19th-e 20thC Inds
79	Ventura, UPRR, Mono, H St	516	1885-1: NA; 1885-2: NA; 1888: 1-f	Devel on 1/4 + paved + open		Mod-High for 19th-e 20thC Inds
80	Mono, UPRR, Inyo, H St	515	1885-1: NA; 1885-2: NA; 1888: 1-b	Devel on 1/3 + paved		Mod for 19th-e 20thC Inds/RRtr

81	Inyo, UPRR, Kern, H St	514	1885-1: 1-frInds, RRtr; 1885-2: 1-fı	No devel, all paved	Mod-High for 19th-e 20thC Inds/RRtr
82	Kern, UPRR, Tulare, H St	513	1885-1: 2-frInds, RRtr; 1885-2: 2-fı	Devel on 1/4 + paved	Mod for 19th C Inds, RRtr
83	Tulare, UPRR, Mariposa, H St	512	1885-1: 1-frInds (SPRR fr depot), I	Devel on 2/3 + paved	Low for 19th-e 20thC S/RRtr/park
84	Mariposa, UPRR, Fresno, H St	511	1885-1: 4-frInds, 3-frO, RRtr; 1885	Develo on 2/3 + paved	Mod for 19th C Inds, RRtr
85	Fresno, UPRR, Merced, H St	510	1885-1: 1-frInds, RRtr; 1885-2: 1-fı	Devel on 1/4 (St.) + paved + opı	Mod for 19th C Inds, RRtr
86	Merced, UPRR, Toulumne, H St	509	1885-1: NA; 1885-2: NA; 1888: NA	No devel, all paved	Mod-High for 19th-e 20thC Inds/RRtr
87	Toulumne, UPRR, Stanislaus, H St	508	1885-1: NA; 1885-2: NA; 1888: NA	No devel, open	Mod-High for 19th-e 20thC Inds/RRtr
88	Stanislaus, UPRR, Calaveras, H St	507	1885-1: NA; 1885-2: NA; 1888: NA	Devel on 1/8 + paved + open	Mod-High for 19th-e 20thC RRtr
89	Calaveras, UPRR, San Joaquin, H St	506	1885-1: NA; 1885-2: NA; 1888: NA	Devel on 1/3 + paved + open	Mod-High for 19th-e 20thC RRtr
90	San Joaquin, UPRR, Amador, H St	505	1885-1: NA; 1885-2: NA; 1888: NA	No devel, paved + open	Mod-High for 19th-e 20thC RRtr, 20thC brO
91	Amador, UPRR, Sacramento , H St	504	1885-1: NA; 1885-2: NA; 1888: NA	Devel on 1/8 + paved + open	Mod-High for 19th-e 20thC Inds, RRtr
92	Sacramento, UPRR, El Dorado, H St	503	1885-1: NA; 1885-2: NA; 1888: NA	Devel on 1/4 + paved + open	Mod-High for 19th-e 20thC RRtr
93	El Dorado, UPRR, Divisadero, H St	501/502	1885-1: NA; 1885-2: NA; 1888: NA	Devel on 1/8 + paved + open	Mod-High for 19th-e 20thC D, S, Inds, RRtr
94	Monterey, H St, San Benito, alley	217W	1885-1: NA; 1885-2: NA; 1888: NA	Devel on 3/4 (Hwy 41) + paved	Low-Mod for 19th-e20thC D
95	San Benito, H St, Santa Clara, alley	218W	1885-1: NA; 1885-2: NA; 1888: NA	Devel on 3/4 + paved	Low for e20thC Inds
96	Santa Clara, H St, Ventura, alley	56W	1885-1: NA; 1885-2: NA; 1888: NA	Mod Inds on 3/4 + pvd S Stadi	Low for historic
97	Ventura, H St, Mono, alley	57W	1885-1: NA; 1885-2: NA; 1888: NA	Mod S on 2/3 + pvd S Stadium	Mod for 19th/e20thC D
98	Mono, H St, Inyo, alley	58W	1885-1: NA; 1885-2: NA; 1888: NA	p1950 Inds on 2/3 + pvd S Sta	Mod for 19th/e20thC Inds/L
99	Inyo, H, Kern, alley	59W	1885-1: 1-frInds, 3-frO; 1885-2: 1-f	Devel on all (stadium)	Low for 19th-e 20thC S, Inds
100	Kern, H, Tulare, alley	60W	1885-1: 3-frS, 2-frD, 3-frO; 1885-2	Devel on all (stadium)	Low for 19th-e 20thC S, Inst, L
101	Tulare, H, Mariposa, alley	61W	1885-1: 7-brS, 1-frS, 3-frO; 1885-2	No devel, all paved	Mod-High for 19th-e 20thC S
102	Mariposa, H, Fresno, alley	62W	1885-1: 5-brS, 5-frS, 2-frO; 1885-2	No devel, all paved	Mod-High for 19th-e 20thC S, Inds
103	Fresno, H, Merced, alley	63W	1885-1:1-frD, 2-frO; 1885-2: 3-frD,	No devel, all paved	Mod-High for 19th-e 20thC S
104	Merced, H, Toulumne, alley	64W	1885-1: NA; 1885-2: NA; 1888: 1-f	Devel on 1/3 + paved + open	Mod-High for 19th-e 20thC S
105	Monterey, alley, San Benito, Broadway	218E	1885-1: NA; 1885-2: NA; 1888: NA	Devel on 3/4+ (Hwy 41) + open	Low for 19th-e 20thC S
106	San Benito, alley, Santa Clara, Broadwa	219E	1885-1: NA; 1885-2: NA; 1888: NA	Devel on 1/2 + paved	Low-Mod for 19th-e 20thC D/S
107	Santa Clara, alley, Ventura, Broadway	56E	1885-1: NA; 1885-2: NA; 1888: NA	Mod S on 1/2 + open S Stadiu	Mod for e20thC S
108	Ventura, alley, Mono, Broadway	57E	1885-1: NA; 1885-2: NA; 1888: NA	p1950 S on 3/4 + pvd S Stadiu	Mod for e20thC S
109	Mono, alley, Inyo, Broadway	58E	1885-1: NA; 1885-2: NA; 1888: NA	p1950 S on 3/4 + pvd S Stadiu	Mod for 19th/e20thC S
110	Inyo, alley, Kern, Broadway	59E	1885-1: 2-brS, 1-frS, 1-frO; 1885-2	Devel on all (stadium)	Low for 19th-e 20thC S
111	Kern, alley, Tulare, Broadway	60E	1885-1: 2-frS, 1-frO; 1885-2: 2-frS;	Devel on all (stadium)	Low for 19th-e 20thC S
112	Tulare, alley, Mariposa, Broadway	61E	1885-1: 6-brS, 1-frS, 8-frO; 1885-2	Devel on 3/4 + paved	Low-Mod for 19th-e20thC S
113	Mariposa, alley, Fresno, Broadway	62E	1885-1: 8-frD, 4-brS, 2-frS, 7-frO; '	No devel, all paved	Mod-High for 19th-e 20thC S
114	Fresno, alley, Merced, Broadway	63E	1885-1: 1-frD, 2-brS, 1-frS, 2-frO; '	Devel on 1/3 + paved	Mod-High for 19th-e 20thC D/S
115	Merced, alley, Toulumne, Broadway	64E	1885-1: NA; 1885-2: NA; 1888: 5-f	Devel on 7/8 + open	Low for 19th-e 20thC D/S
116	San Benito, Broadway, Santa Clara, alle	206W	1885-1: NA; 1885-2: NA; 1888: NA	Devel on 3/4 + paved	Low for 19th-e 20thC D/Inds/S
117	Santa Clara, Broadway, Ventura, alley	77W	1885-1: NA; 1885-2: NA; 1888: NA	Mod S on 1/4 + open + pvd S S	Mod for 19th-e 20thC D/S
118	Ventura, Broadway, Mono, alley	76W	1885-1: NA; 1885-2: NA; 1888: NA	p1950/Mod S on 2/3 + pvd S S	Mod for 19th-e 20thC D/S
119	Mono, Broadway, Inyo, alley	75W	1885-1: NA; 1885-2: NA; 1888: NA	p1920 S on 3/4 + pvd S Stadiu	Mod for 19th-e 20thC D/S
120	Inyo, Broadway, Kern, alley	74W	1885-1: 6-frD, 1-frS, 4-frO; 1885-2	Devel on 2/3 + paved (stadium)	Low for 19th-e 20thC D/S
121	Kern, Broadway, Tulare, alley	73W	1885-1: 2-frD, 1-brS; 1885-2: 1-frI	Devel on all (stadium)	Low for 19th-e 20thC D/S
122	Tulare, Broadway, Mariposa, alley	72W	1885-1: 6-brS, 3-frS, 1-frO; 1885-2	Devel on 7/8 + paved	Low for 19th-e 20thC S
123	Mariposa, Broadway, Fresno, alley	71W	1885-1: 7-frD, 3-brS, 3-frS, 6-frO; '	Devel on all	Low for 19th-e 20thC D/S

124	Fresno, Broadway, Merced, alley	70W	1885-1: 6-frD, 2-frS, 4-frO; 1885-2	Devel on 1/2 + paved + open	Mod-High for 19th-e 20thC D/S/Inst
125	Merced, Broadway, Toulumne, alley	69W	1885-1:NA; 1885-2:NA; 1888: 7-frI	No devel, paved + open	Mod-High for 19th-e 20thC D/S/Inst/Util
126	San Benito, alley, Santa Clara, Fulton	206E	1885-1: NA; 1885-2: NA; 1888: NA	No devel, paved + open	Mod for 19th-e 20thC D/O
127	Santa Clara, alley, Ventura, Fulton	77E	1885-1: NA; 1885-2: NA; 1888: NA	p1950 S on 1/2 + pvd S Stadiu	Mod for 19th-e 20thC D/Ch
128	Ventura, alley, Mono, Fulton	76E	1885-1: NA; 1885-2: NA; 1888: NA	Mod S on 1/2 + pvd S Stadium	Mod for 19th-e 20thC D/S
129	Mono, alley, Inyo, Fulton	75E	1885-1: NA; 1885-2: NA; 1888: NA	Mod S on 3/4 + pvd S Stadium	Mod for 19th-e 20thC D
130	Inyo, alley, Kern, Fulton	74E	1885-1: NA; 1885-2: NA; 1888: 1-f	Devel on 1/2 + paved	Mod-High for 19th-e 20thC S
131	Kern, alley, Tulare, Fulton	73E	1885-1: 4-frD, 5-frO; 1885-2: 4-frD	Devel on all	Low for 19th-e 20thC D/S
132	Tulare, alley, Mariposa, Fulton	72E	1885-1: 5-brS, 1-frS, 1-frD,2-frO; 1	Devel on 3/4 + paved	Mod-High for 19th-e 20thC S
133	Mariposa, alley, Fresno, Fulton	71E	1885-1: 4-frD, 5-brS, 2-frS, 2-frInst	Devel on 3/4 + paved	Mod-High for 19th-e 20thC S
134	Fresno, alley, Merced, Fulton	70E	1885-1: 5-frD, 1-frS, 5-frO; 1885-2	Devel on all	Low for 19th-e 20thC D/S
135	Merced, alley, Toulumne, Fulton	69E	1885-1: NA; 1885-2: NA; 1888: 6-f	Devel on 1/4 + paved	Mod-High for 19th-e 20thC S
136	San Benito, Fulton, Santa Clara, alley	205W	1885-1: NA; 1885-2: NA; 1888: NA	Devel on 1/2 + paved + open	Mod for 19th-e 20thC D/O
137	Santa Clara, Fulton Ventura, alley	78W	1885-1: NA; 1885-2: NA; 1888: NA	Mod S on 1/3 + pvd S Stadium	Mod for e 20thC D/O
138	Ventura, Fulton, Mono, alley	79W	1885-1: NA; 1885-2: NA; 1888: NA	p1950/Mod S on 1/2 + pvd S S	Mod for 19th/e20thC D/S
139	Mono, Fulton, Inyo, alley	80W	1885-1: NA; 1885-2: NA; 1888: NA	p1950 S on 3/4 + pvd S Stadiu	Low for e20thC S
140	Inyo, Fulton, Kern, alley	81W	1885-1: NA; 1885-2: NA; 1888: 3-f	Devel on all	Low for 19th-e 20thC D/S
141	Kern, Fulton, Tulare, alley	82W	1885-1: 5-frD, 6-frO; 1885-2: 5-frD	Devel on all	Low for 19th-e 20thC D/S
142	Tulare, Fulton, Mariposa, alley	83W	1885-1: 1-frD, 7-frS, 5-brS, 4-frO;	Devel on all	Low for 19th-e 20thC D/S
143	Mariposa, Fulton, Fresno, alley	84W	1885-1: 2-frD, 8-frS, 2-brS, 4-frO;	Devel on 7/8 + paved	Low for 19th-e 20thC D/S
144	Fresno, Fulton, Merced, alley	85W	1885-1: 7-frD, 3-brD, 7-frO; 1885-2	Devel on 3/4 + paved	Mod for 19th-e 20thC S
145	Merced, Fulton, Toulumne, alley	86W	1885-1:NA; 1885-2: NA; 1888: 5-fr	Devel on 1/2 + paved	Mod-High for 19th-e 20thC S
146	San Benito, alley, Santa Clara, Van Nes	205E	1885-1: NA; 1885-2: NA; 1888: NA	Devel on 2/3 + paved	Low-Mod for 19th-e 20thC D/S
147	Santa Clara, alley, Ventura, Van Ness	78E	1885-1: NA; 1885-2: NA; 1888: NA	p1920 D/Mod S on 1/2 + pvd +	Mod for 19th/e20thC D/S
148	Ventura, alley, Mono, Van Ness	79E	1885-1: NA; 1885-2: NA; 1888: NA	p1950 S on 1/8 + pvd S Stadiu	Mod for 19th/e20thC D/S
149	Mono, alley. Inyo, Van Ness	80E	1885-1: NA; 1885-2: NA; 1888: NA	p1950 S on 3/4 + pvd S Stadiu	Low-Mod for 19th/e20thC D
150	Inyo, alley, Kern, Van Ness	81E	1885-1: NA; 1885-2: NA; 1888: 3-f	Devel on all	Low for 19th-e 20thC D/S
151	Kern, alley, Tulare, Van Ness	82E	1885-1: 4-frD, 1-frS, 9-frO; 1885-2	Devel on 2/3 + paved	Mod for 19th-e 20thC S
152	Tulare, alley, Mariposa, Van Ness	83E	1885-1: 2-frD, 2-brS, 5-frS, 5-frO;	Devel on all	Low for 19th-e 20thC S
153	Mariposa, alley, Fresno, Van Ness	84E	1885-1: 4-frD, 2-brS, 3-frS, 5-frO;	Devel on all	Low for 19th-e 20thC S
154	Fresno, alley, Merced, Van Ness	85E	1885-1: 7-frD, 7-frO; 1885-2: 8-frD	Devel on all	Low for 19th-e 20thC S
155	Merced, alley, Toulumne, Van Ness	86E	1885-1: NA; 1885-2: NA; 1888: 5-f	Devel on 2/3 + paved	Low-Mod for 19th-e 20thC S
156	San Benito, Van Ness, Santa Clara, alle	193W	1885-1: NA; 1885-2: NA; 1888: NA	Devel on 1/2 + paved + open	Mod for 19th-e 20thC Inst
157	Santa Clara, Van Ness, Ventura, alley	99W	1885-1: NA; 1885-2: NA; 1888: NA	Devel on 2/3 + paved	Low-Mod for e 20thC S
158	Ventura, Van Ness, Mono, alley	98W	1885-1: NA; 1885-2: NA; 1888: 5-f	Devel on 1/2 + paved	Low-Mod for 19th-e 20thC D
159	Mono, Van Ness, Inyo, alley	97W	1885-1: NA; 1885-2: NA; 1888: 2-f	Devel on 1/4 + paved	Mod for 19th-e 20thC D/S/Ch/Inst
160	Inyo, Van Ness, Kern, alley	96W	1885-1: NA; 1885-2: NA; 1888: 2-f	Devel on all	Low for 19th-e 20thC D/S
161	Kern, Van Ness, Tulare, alley	95W	1885-1: NA; 1885-2: NA; 1888: 5-f	Devel on all	Low for 19th-e 20thC D/S
162	Tulare, Van Ness, Mariposa, alley	94W	1885-1: NA; 1885-2: NA; 1888: NA	No devel - Ct. Ho. Park	Low for historic
163	Mariposa, Van Ness, Fresno, alley	93W	1885-1: NA; 1885-2: NA; 1888: NA	No devel - Ct. Ho. Park	Mod for e 20thC Inst
164	Fresno, Van Ness, Merced, alley	92W	1885-1:2-frD, 2-frS, 1-frCh, 2-frO;	Devel on 2/3 + paved	Mod for 19th-e 20thC D/S
165	Merced, Van Ness, Toulumne, alley	91W	1885-1:NA; 1885-2: NA; 1888: 4-fr	Devel on all	Low for 19th-e 20thC D/S
166	San Benito, alley, Santa Clara, L St	193E	1885-1: NA; 1885-2: NA; 1888: NA	Devel on 3/4 + paved	Low for 19th-e 20thC D, e 20th Inst

167	Santa Clara, alley Ventura, L St	99E	1885-1: NA; 1885-2: NA; 1888: NA	Devel on 1/2 + paved	Mod for 19th-e 20thC D/Ch
168	Ventura, alley, Mono, L St	98E	1885-1: NA; 1885-2: NA; 1888: 1-f	Devel on 1/3 + paved	Mod for 19th-e 20thC D/S
169	Mono, alley, Inyo, L St	97E	1885-1: NA; 1885-2: NA; 1888: 6-f	Devel on 7/8 + paved	Low for 19th-e 20thC D/S
170	Inyo, alley, Kern, L St	96E	1885-1: NA; 1885-2: NA; 1888: 4-f	Devel on 1/2 + paved	Low-Mod for 19th-e 20thC D/S
171	Kern, alley, Tulare, L St	95E	1885-1: NA; 1885-2: NA; 1888: 2-f	Devel on 2/3 + paved	Mod for e 20thC S
172	Tulare, alley, Mariposa, L St	94E	1885-1: NA; 1885-2: NA; 1888: NA	Devel on 1/8 + open (Court Ho.	Low for historic
173	Mariposa, alley, Fresno, L St	93E	1885-1: NA; 1885-2: NA; 1888: NA	No devel, open (Court Ho. Park	Low for historic
174	Fresno, alley, Merced, L St	92E	1885-1: 3-frD, 3-frS, 2-frO; 1885-2	Devel on 1/2 + paved	Mod for 19th-e 20thC D/S
175	Merced, alley, Toulumne, L St	91E	1885-1: NA; 1885-2: NA; 1888: 6-f	Devel on 1/8 + paved	Mod-High for 19th-e 20thC S
176	San Benito, L St, Santa Clara, alley	192W	1885-1: NA; 1885-2: NA; 1888: NA	Devel on 7/8 + paved	Low for 19th-e 20thC D/S
177	Santa Clara, L St, Ventura, alley	100W	1885-1: NA; 1885-2: NA; 1888: NA	Devel on 1/4 + paved	Mod for 19th-e 20thC D/S
178	Ventura, L St, Mono, alley	101W	1885-1: NA; 1885-2: NA; 1888: NA	Devel on 1/4 + paved	Mod for 19th-e 20thC D/S
179	Mono, L St, Inyo, alley	102W	1885-1: NA; 1885-2: NA; 1888: 9-f	Devel on 2/3 + paved	Mod for 19th-e 20thC D
180	Inyo, L St, Kern, alley	103W	1885-1: NA; 1885-2: NA; 1888: 3-f	Devel on 3/4 + paved	Low for 19th-e 20thC D
181	Kern, L St, Tulare, alley	104W	1885-1: 1-frS; 1885-2: 1-frS; 1888:	Devel on 7/8 + paved	Low for 19th-e 20thC S/Inds
182	Tulare, L St, Mariposa, alley	105W	1885-1: NA; 1885-2: NA; 1888: 1-b	Devel on 1/4 + open	Low for historic
183	Mariposa, L St, Fresno, alley	106W	1885-1: NA; 1885-2: NA; 1888: 1-b	Devel on 2/3 + open	Low for historic
184	Fresno, L St, Merced, alley	107W	1885-1: 4-frD, 1-frCh, 7-frO; 1885-	Devel on 1/4 + paved	Mod-High for 19th-e 20thC D/S/Ch, 20thC Inst
185	Merced, L St, Toulumne, alley	108W	1885-1: NA; 1885-2: NA; 1888: 3-f	Devel on 1/4 + paved	Mod for 19th C D, e 20thC D/S/Ch
186	San Benito, alley, Santa Clara, M St	192E	1885-1: NA; 1885-2: NA; 1888: NA	Devel on 2/3 + paved + open	Low-Mod for 19th-e 20thC D
187	Santa Clara, alley, Ventura, M St	100E	1885-1: NA; 1885-2: NA; 1888: NA	Devel on 3/4 + paved + open	Low-Mod for 19th-e 20thC D
188	Ventura, alley, Mono, M St	101E	1885-1: NA; 1885-2: NA; 1888: 2-f	Devel on 1/2 + paved	Low-Mod for 19th C D, e 20thC D/S
189	Mono, alley, Inyo, M St	102E	1885-1: NA; 1885-2: NA; 1888: 4-f	Devel on 7/8 + paved	Low for 19th-e 20thC D
190	Inyo, alley, Kern, M St.	103E	1885-1: NA; 1885-2: NA; 1888: 5-f	Devel on 2/3 + paved	Low-Mod for 19th-e 20thC D
191	Kern, alley, Tulare, M St	104E	1885-1: NA; 1885-2: NA; 1888: 1-b	Devel on all	Low for 19th-e 20thC S/Inds
192	Tulare, alley, Mariposa, M St	105E	1885-1: NA; 1885-2: NA; 1888: 1-b	Devel on 1/4 + open	Low for historic
193	Mariposa, alley, Fresno, M St	106E	1885-1: NA; 1885-2: NA; 1888: 2-b	Devel on 1/2 + open	Low for historic
194	Fresno, alley, Merced, M St	107E	1885-1: 6-frD, 1-brD, 6-frO; 1885-2	Devel on all	Low for 19th-e 20thC D/S
195	Merced, alley, Toulumne, M St	108E	1885-1: NA; 1885-2: NA; 1888: 3-	Devel on all	Low for 19th-e 20thC D/S
196	San Benito, M St, Santa Clara, alley	184W	1885-1: NA; 1885-2: NA; 1888: N	Devel on 1/2 + open	Mod for 19th-e 20thC D
197	Santa Clara, M St, Ventura, alley	121W	1885-1: NA; 1885-2: NA; 1888: N	Devel on 2/3 + paved	Low-Mod for 19th-e 20thC D
198	Ventura, M St, Mono, alley	120W	1885-1: NA; 1885-2: NA; 1888: 2-	Devel on all	Low for 19th-e 20thC D, e 20thC S
199	Mono, M St, Inyo, alley	119W	1885-1: NA; 1885-2: NA; 1888: 2-	Devel on all	Low for 19th-e 20thC D, e 20thC S
200	Inyo, M St, Kern, alley	118W	1885-1: NA; 1885-2: NA; 1888: 5-	Devel on all	Low for 19th-e 20thC D, e 20thC S
201	Kern, M St, Tulare, alley	117W	1885-1: NA; 1885-2: NA; 1888: 4-	Devel on 2/3 + paved	Low-Mod for 19th-e 20thC D, e 20thC S
202	Tulare, M St, Mariposa, alley	116W	1885-1: NA; 1885-2: NA; 1888: 3-	Devel on 7/8 + paved	Low for 19th-e 20thC D/Ch
203	Mariposa, M St, Fresno, alley	115W	1885-1: 3-frD, 1-brCh, 6-frO; 1885	Devel on 1/2 + paved	Low-Mod for 19th-e 20thC D/Ch
204	Fresno, M St, Merced, alley	114W	1885-1: 5-frD, 5-frO; 1885-2: 5-frD	Devel on 1/3 + paved	Mod for 19th-e 20thC D, e 20thC S
205	Merced, M St, Toulumne, alley	113W	1885-1: NA; 1885-2: NA; 1888: 5-	Devel on 1/2 + paved	Low-Mod for 19th-e 20thC D
206	San Benito, alley, Santa Clara, N St	184E	1885-1: NA; 1885-2: NA; 1888: NA	Devel on 3/4 + open	Low for 19th-e 20thC D
207	Santa Clara, alley, Ventura, N St	121E	1885-1: NA; 1885-2: NA; 1888: NA	Devel on 2/3 + paved	Low-Mod for 19th-e 20thC D
208	Ventura, alley, Mono, N St	120E	1885-1: NA; 1885-2: NA; 1888: 1-f	Devel on all	Low for 19th-e 20thC D/Ch, e 20thC S
209	Mono, alley, Inyo, N St	119E	1885-1: NA; 1885-2: NA; 1888: 4-f	Devel on all	Low for 19th-e 20thC D/S

210	Inyo, alley, Kern, N St	118E	1885-1: NA; 1885-2: NA; 1888: 2-f	Devel on all	Low for 19th-e 20thC D/S	
211	Kern, alley, Tulare, N St	117E	1885-1: NA; 1885-2: NA; 1888: 2-f	Devel on 3/4 + paved	Low for 19th-e 20thC D	
212	Tulare, alley, Mariposa, N St	116E	1885-1: NA; 1885-2: NA; 1888: 4-f	Devel on 2/3 + paved	Low-Mod for 19th-e 20thC D, e 20thC S	
213	Mariposa, alley, Fresno, N St	115E	1885-1: 2-frD, 1-brS, 6-frO; 1885-2	Devel on 1/2 + paved + open	Low-Mod for 19th-e 20thC D/S	
214	Fresno, alley, Merced, N St	114E	1885-1: 2-frD, 1-brCh, 2-frO; 1885	Devel on 2/3 + paved	Low-Mod for 19th-e 20thC D/Inst	
215	Merced, alley, Toulumne, N St	113E	1885-1: NA; 1885-2: NA; 1888: 4-f	Devel on 2/3 + paved	Mod for 19th-e 20thC D/Ch	
216	Ventura, N St, Mono, alley	123W	1885-1: NA; 1885-2: NA; 1888: NA	No devel, all paved	Mod-High for 19th-e 20thC D, e 20thC S	
217	Mono, N St, Inyo, alley	124W	1885-1: NA; 1885-2: NA; 1888: NA	Devel on 7/8 + paved	Low for 19th-e 20thC D	
218	Inyo, N St, Capitol, alley	125W	1885-1: NA; 1885-2: NA; 1888: NA	No devel, all paved	Mod for 19th-e 20thC D	
219	Ventura, alley, Mono, O St	123E	1885-1: NA; 1885-2: NA; 1888: NA	No devel, all paved	Mod-High for 19th-e 20thC D, e 20thC S	
220	Mono, alley, Inyo, O St	124E	1885-1: NA; 1885-2: NA; 1888: NA	Devel on 7/8 + paved	Low for 19th-e 20thC D	
221	Inyo, alley, Capitol, O St	125E	1885-1: NA; 1885-2: NA; 1888: NA	No devel, all paved	Mod for 19th-e 20thC D	
	ARTS AND CULTURE DISTRICT					
	Tuolumne, H St, Stanislaus, Broadway	65	NA 1885; 1888: ; 1898: ; 1906: ; 19	p1950 S on 1/2 + open + pvd	Mod for historic S/D	
	Stanislaus, H St, Calaveras, Broadway	66	NA 1885; 1888: ; 1898: ; 1906: ; 19	p1950 S on 3/4 + Pvd	Mod for historic D	
	Calaveras, H St, San Joaquin, Broadwa	335	NA 1885; 1888: ; 1898: ; 1906: ; 19	p1950/Mod S on 3/4 + pvd	Low-Mod for historic D/S	
	San Joaquin, H St, Amador, Broadway	345	NA 1885; 1888: ; 1898: ; 1906: ; 19	p1950 S on 3/4 + pvd	Low for historic	
	Amador, H St, Sacramento, Broadway	367	NA 1885-1888 ; 1898: ; 1906: ; 19	Mod S on 3/4 + pvd + open	Mod for historic S/D	
	Sacramento, H St, El Dorado, Broadway	372	NA 1885-1888 ; 1898: ; 1906: ; 19	p1950/Mod S on 3/4 + pvd	Low-Mod for historic D	
	El Dorado, H St, Divisadero, Broadway	390	NA 1885-1888 ; 1898: ; 1906: ; 19	Mod S on 1/2 + pvd	Mod for histroic S/D	
	Tuolumne, Broadway, Stanislaus, Fultor	68	NA 1885; 1888: ; 1898: ; 1906: ; 19	p1950 S/Ch on 3/4 + pvd	Mod for histroic S/D	
	Stanislaus, Broadway, Calaveras, Fultor	67	NA 1885; 1888: ; 1898: ; 1906: ; 19	Mod S on 1/2 + pvd	Mod for histroic S/D	
	Calaveras, Broadway, San Joaquin, Fult	336	NA 1885; 1888: ; 1898: ; 1906: ; 19	Mod S on 1/2 + pvd	Mod for histroic S/D	
	San Joaquin, Broadway, Amador, Fultor	344	NA 1885; 1888: ; 1898: ; 1906: ; 19	p1950/Mod S on 1/2 + pvd	Low-Mod for historic	
	Amador, Broadway, Sacramento, Fulton	368	NA 1885-1888 ; 1898: ; 1906: ; 19	Mod S on 3/4 + pvd + open	Mod for historic D	
	Sacramento, Broadway, El Dorado, Divi	371	NA 1885-1888 ; 1898: ; 1906: ; 19	Mod S on 3/4 + pvd	Low-Mod for historic	
	Tuolumne, Fulton, Stanislaus, Van Ness	87	NA 1885; 1888: ; 1898: ; 1906: ; 19	p1950/Mod S/Ch on 3/4 + pvd	Mod for historic D/S	
	Stanislaus, Fulton, Calaveras, Van Ness	86	NA 1885; 1888: ; 1898: ; 1906: ; 19	p1950/Mod S on 1/2 + pvd + op	Mod for historic D/S	
	Calaveras, Fulton, San Joaquin, Van Ne	337	NA 1885; 1888: ; 1898: ; 1906: ; 19	Mod S on 1/4 + pvd	Mod for historic D	
	San Joaquin, Fulton, Amador, Van Ness	343	NA 1885; 1888: ; 1898: ; 1906: ; 19	p1950/Mod S on 1/2 + pvd + op	Mod for historic D/S	
	Amador, Fulton, Divisadero, Van Ness	369/411	NA 1885-1888 ; 1898: ; 1906: ; 19	Mod S/p1950 D on 3/4 + pvd	Low-Mod for historic	
	Tuolumne, Van Ness, Stanislaus, L St	90	NA 1885; 1888: ; 1898: ; 1906: ; 19	p1950/Mod S on 3/4 + pvd	Mod for historic D/S	
	Stanislaus, Van Ness, Calaveras, L St	89	NA 1885; 1888: ; 1898: ; 1906: ; 19	p1950 D/S + Mod S on 1/2 + pv	Mod-High for historic D/S	
	Calaveras, Van Ness, San Joaquin, L St	338	NA 1885-1888 ; 1898: ; 1906: ; 19	p1950 D + Mod S/Inst on 3/4 +	Mod for historic D	L St HD
	San Joaquin, Van Ness, Amador, L St	342	NA 1885-1888 ; 1898: ; 1906: ; 19	p1950 S/Apt/D on 1/2 + pvd + o	Mod for historic D/S	L St HD
	Amador, Van Ness, Divisidero, L St	370	NA 1885-1888 ; 1898: ; 1906: ; 19	Mod S on 1/2 + pvd + open	Mod for historic D	
	Tuolumne, L St, Stanislaus, M St	109	NA 1885; 1888: ; 1898: ; 1906: ; 19	Mod S on 1/2 + pvd + open	Mod for historic D/Apt	
	Stanislaus, L St, Calaveras, M St	110	NA 1885; 1888: ; 1898: ; 1906: ; 19	p1950 Apt on 1/4 + pvd	Mod for historic D/Apt/S	
	Calaveras, L St, San Joaquin, M St	339	NA 1885; 1888: ; 1898: ; 1906: ; 19	Mod S/Inst on 3/4 + pvd	Low-Mod for historic	L St HD
	San Joaquin, L St, Divisadero, M St	341	NA 1885-1888 ; 1898: ; 1906: ; 19	p1950 D/Mod S on 1/2 + pvd +	Mod for historic D	L St HD
	Tuolumne, M St, Stanislaus, alley	112W	NA 1885; 1888: ; 1898: ; 1906: ; 19	p1950 S/Mod Inst on 3/4 + pvd	Low-Mod for historic	
	Stanislaus, M St, Calaveras, alley	111W	NA 1885; 1888: ; 1898: ; 1906: ; 19	p1950 S/Mod Ch on 3/4 + pvd	Low-Mod for historic	L St HD
	Calaveras, M St, Divisadero, alley	340W	NA 1885-1888 ; 1898: ; 1906: ; 19	p1920 D/p1950 Inst on 1/2 + o	Low-Mod for historic	L St HD

DOWNTOWN NEIGHBORHOODS COMMUNITY PLAN AREA

Block Ref.	Block Boundaries	SanBlk#	Historical Development	Current Conditions	Archaeological Sensitivity
1	Olive, Marks, Hedges, (Monte)	2660	NA all maps maps	Mod SF D on all	Low for historic
2	Hedges, Marks, (Floradora), (Monte)	2660	NA all maps maps	Hist. on 1/8 (farm) + open	Low-Mod for historic
3	(Floradora), Marks, Home, (Monte)	2660	NA all maps maps	No , open	Low for historic
4	Home, Marks, McKinley, (Monte)	2660	NA all maps maps	Mod SF D on 7/8 + hist. (far	Low-Mod for historic
5	McKinley, Marks, (University), (Monte)	2650	NA all maps maps	Mod D on 1/2 + open	Low for historic
6	(University), Marks, (Weldon), (Monte)	2650	NA all maps maps	Mod D on all	Low for historic
7	(Weldon), Marks, (Yale), (Monte)	NA	NA all maps maps	Mod D on all	Low for historic
8	(Yale), Marks, Clinton, (Monte)	NA	NA all maps maps	Mod on 1/8 + pvd + open	Low for historic
9	Olive, (Monte), (Hedges), (Pleasant)	2660	NA all maps maps	Mod D on all	Low for historic
10	(Hedges), (Monte), (Floradora), Pleasant	2660	NA all maps maps	Mod D on all	Low for historic
11	(Floradora), (Monte), (Home), (Pleasant)	2660	NA all maps maps	Mod D on all	Low for historic
12	(Home), (Monte), McKinley, (Pleasant)	2660	NA all maps maps	Mod D on all	Low for historic
13	McKinley, (Monte), (University), (Pleasant)	2650	NA all maps maps	Hist. on 1/8 (farms) + open +	Low-Mod for historic
14	(University), (Monte), (Weldon), (Pleasant)	2650	NA all maps maps	No , all pvd	Low for historic
15	(Weldon), (Monte), (Yale), Pleasant	NA	NA all maps maps	Mod Inds on 1/2 + pvd + ope	Low for historic
16	(Yale), (Monte), Clinton, Pleasant	NA	NA all maps maps	Mod Inds on 1/3 + pvd	Low for historic
17	Olive, Pleasant, Hedges, Lafayette	2660	NA all maps maps	p1950 D on 1/2 + open	Low-Mod for historic
18	Hedges, Pleasant, Floradora, Layfayette	2666	NA all maps maps	p1950 D on 2/3 + open	Low-Mod for historic
19	Floradora, Pleasant, Home, (Layfayette)	2660	NA all maps maps	Mod D on 1/4 + open	Low for historic
20	Home, Pleasant, McKinley, Lafayette	2660	NA all maps maps	Mod D on all	Low for historic
21	McKinley, (Pleasant), (University), Lafayette	2650	NA all maps maps	p1950 D/Inds on 1/3 + pvd	Low for historic
22	(University), (Pleasant), (Weldon), Lafayette	2650	NA all maps maps	Mod Inds on 1/4 + pvd	Low for historic
23	(Weldon), Pleasant, (Yale), (Lafayette)	NA	NA all maps maps	Mod S on 2/3 + open	Low for historic
24	(Yale), Pleasant, Clinton, (Lafayette)	NA	NA all maps maps	Mod S , Fwy on all	Low for historic
25	Olive, Lafayette, Hedges, Hughes	2668	NA all maps maps	p1950 D on 3/4 + open	Low-Mod for historic
26	Hedges, Lafayette, Floradora, Hughes	2667	NA all maps maps	p1950 D on 1/3 + open	Low-Mod for historic
27	Floradora, Lafayette, (Home), Hughes	2660	NA all maps maps	p1950 D on 1/4 + Dervoir	Low for historic
28	(Home), Lafayette, McKinley, Hughes	2660	NA 1885-1918, 1948: 2frD,	Mod school on 3/4 + open	Low for historic
29	McKinley, Lafayette, (University), Hughes	2658/2666	NA 1885-1918, 1948: 3frD,	p1950 D 1/3, Mod lt inds + p	Low for historic
30	(University), Lafayette, (Weldon), Hughes	2657/2659	NA all maps maps	Mod lt Inds on 1/3 + pvd, fwy	Low for historic
31	(Weldon), Lafayette,(Yale), (Hughes)	NA	NA all maps maps	Mod lt Inds/D on 1/4 + pvd, f	Low for historic
32	(Yale), (Lafayette), Clinton, (Hughes)	NA	NA all maps maps	Fwy on 3/4 + open	Low for historic
33	Belmont, Hughes, (Thomas), (Hulbert)	NA	NA all maps maps	p1950 D on 1/4, Mod Inds/O	Low for historic
34	(Thomas), Hughes, Dudley, (Hulbert)	NA	NA all maps maps	p1950 D on 1/4, Mod Inds/O	Low-Mod for historic
35	Dudley, Hughes, Dennett, Hulbert	2677	NA all maps maps	p1960 D on 1/2 + open	Low for historic

36	Dennett, Hughes, Olive, (Hulbert)	2677	NA all maps maps	p1960 on 1/4 + open	Low for historic
37	Olive, Hughes, Hedges, (Hulbert)	2602	NA all maps maps	p1960 D on 1/2 + open	Low for historic
38	Hedges, Hughes, Floradora, (Hulbert)	2602	NA all maps maps	Mod D/off on 3/4 + pvd	Low for historic
39	Floradora, Hughes, (Home), (Hulbert)	2602	NA 1885-1918, 1948: 13frD	p1960 D/Inds on 2/3 + open	Low-Mod for historic
40	(Home), Hughes, McKinley, (Hulbert)	2601	NA 1885-1918, 1948: 16frL	Mod lt Inds on 1/4 + pvd + fw	Low for historic
41	McKinley, Hughes,(University), (Hulbert)	2600	NA 1885-1918, 1948: 7frL,	Mod off , fwy on 1/2 + open	Low-Mod for historic
41	(University), Hughes,(Weldon), (Hulbert)	2600	NA all maps maps	Mod D , fwy on 3/4 + open	Low for historic
43	(Weldon), Hughes, (Yale), (Hulbert)	NA	NA all maps maps	Mod D, off, fwy on 3/4 + ope	Low for historic
44	(Yale), Hughes, Clinton, (Hulbert)	NA	NA all maps maps	Fwy on 1/4 + open	Low for historic
45	Belmont, (Hulbert), (Thomas), Crystal	NA	NA all maps maps	Mod Inds on all	Low for historic
46	(Thomas), (Hulbert), Dudley, (Crystal)	NA	NA all maps maps	Mod D on 1/8 + open	Low for historic
47	Dudley, Hulbert, (Dennett), Crystal	2678	NA all maps maps	p1950 D on 1/2 + open	Low-Mod for historic
48	(Dennett), (Hulbert), Olive, Crystal	2678	NA all maps maps	p1960 D/comm on 3/4 + ope	Low-Mod for historic
49	Olive, (Hulbert), Hedges, Crystal	2602	NA all maps maps	Mod S on 1/4 _ open	Low for historic
50	Hedges, Hulbert, Floradora, Crystal	2602	NA 1885-1918, 1948: 6frD,	Mod S/lt Inds on all	Low for historic
51	Floradora, (Hulbert), (Home), (Crystal)	2602	NA 1885-1918, 1948: 12frD	p1960 D/Mod Inds/Fwy on 1/	Mod for historic
52	(Home), (Hulbert), McKinley, (Crystal)	2601	NA 1885-1918, 1948: 3frL (	Mod Inds/Fwy + pvd on all	Low-Mod for historic
53	McKinley, (Hulbert), (University), (Crystal)	2600	NA all maps maps	Mod Inds on 1/4 + open	Low for historic
54	(University), (Hulbert), Weldon, (Crystal)	2600/2604	NA all maps maps	Mod/p1960 D /Fwy on all	Low for historic
55	Weldon, (Hulbert)/Weber, Yale, Crystal	NA	NA all maps maps	Mod Inds/p1960 D on all	Low for historic
56	Yale, (Hulbert)/Weber, Clinton, Crystal	NA	NA all maps maps	Mod D/S on all	Low for historic
57	Belmont, Crystal, Thomas,(Warren)	NA	NA all maps maps	Mod S/p1960 D on 1/2 + ope	Low for historic
58	(Thomas), Crystal, Dudley, (Warren)	NA	NA all maps maps	p1960 D on 1/2 + open	Low for historic
59	Dudley, Crystal, Dennett, (Warren)	2678	NA all maps maps	p1960 D on 1/2 + open	Low for historic
60	Dennett, Crystal, Olive, (Warren)	2678	NA all maps maps	p1960 D/Mod S on 3/4 + pvd	Low for historic
61	Olive, Crystal, Hedges, (Warren)	2603	NA 1885-1918, 1948: 3frL c	Mod S/Fwy on 1/2 + pvd	Low for historic
62	Hedges, Crystal, (Floradora), (Warren)	2602	NA 1885-1918, 1948: 3frL c	Mod Inds/Fwy/Dervoir + pvd	Low for historic
63	(Floradora), Crystal, (Home), (Warren)	2601	NA all maps maps	Mod Insdtl/S on 1/4 + pvd	Low for historic
64	(Home), Crystal, McKinley, (Warren)	2601	NA all maps maps	Mod Inds on 1/2 + open	Low for historic
65	McKinley, Crystal, (University), (Warren)	2604	NA all maps maps	Rds. On 1/4 + open	Low for historic
66	(University), (Crystal) Weldon, (Warren)	2604	NA all maps maps	Mod Inds/Rds/Mod D on 3/4 ·	Low for historic
67	Belmont, (Warren), Thomas, (West)	NA	NA all maps maps	Mod D/Inds on 3/4 + open +	Low for historic
68	Thomas, (Warren), Dudley, (West)	NA	NA all maps maps	p1960 D/Mod Inds/Fwy on 3/	Low for historic
69	Dudley, (Warren), Dennett, (West)	2678	NA all maps maps	Mod Inds/Fwy on 3/4 + park	Low for historic
70	Dennett, (Warren) Olive, (West)	2678	NA all maps maps	Mod Inds/S on 3/4 + park	Low for historic
71	Olive, (Warren), Hedges, (West)	2602	NA all maps maps	Mod Inds on 1/2 + pvd	Low for historic
72	Hedges, (Warren), (Floradora), West	2602	NA all maps maps	Mod Inds on 1/3 + pvd	Low for historic
73	Floradora, (Warren), (Home), West	2601	NA all maps maps	Mod Inds/Rd on 1/3 + pvd	Low for historic
74	(Home), (Warren), McKinley, West	2601	NA all maps maps	Mod Inds/p 1960 D/Rd on all	Low for historic
75	Kearney, West, (Tuolumne), Channing	NA	NA all maps maps	Mod Inds on 1/2 + open	Low for historic

76	(Tuolumne), West, (San Joaquin), Channing	NA	NA all maps maps	Mod Industl on 1/2 + pvd	Low for historic
77	(San Joaquin), West, (Amador), (Channing)	NA	NA all maps maps	Mod Airpt on 3/4 + open	Low for historic
78	(Amador), West, El Dorado, (Channing)	NA	NA all maps maps	Mod Airpt/Inds on 3/4 + oper	Low for historic
79	El Dorado, West, (Ronquillo), (Channing)	NA	NA all maps maps	Mod Inds/Fwy on 3/4 + open	Low for historic
80	(Ronquillo), West, Nielsen, (Channing)	NA	NA all maps maps	Mod Inds on 3/4 + open	Low for historic
81	Nielsen, West, (Nevada), (Channing)	NA	NA all maps maps	Cemetery on all (Belmonta)	Low for historic
82	Nevada, West, RR, (Channing)	NA	NA all maps maps	Cemetery on all (Belmonta)	Low for historic
83	RR, West, Franklin, Channing	NA	NA all maps maps	Cemetery/Mod D on all	Low for historic
84	Franklin, West, Belmont, (Channing)	NA	NA all maps maps	Cemetery on 1/2, Fwy on 1/2	Low for historic
85	Belmont, West, Thomas, Channing	NA	NA all maps maps	Mod Inds/Fwy on 1/3 + park (	Low for historic
86	Thomas, West, Dudley, Channing	NA	NA all maps maps	Park (Roeding) on all	Low for historic
87	Dudley, West, Dennett, Channing	2350	NA all maps maps	Park (Roeding) on all	Low for historic
88	Dennett, (West), Olive, (Channing)	2350	NA all maps maps	Park (Roeding) on all	Low for historic
89	Olive, West, Hedges, (Channing)	2603	NA all maps maps	Mod Inds/S on 1/2 + pvd	Low for historic
90	Hedges, West, (Floradora), (Channing)	2603	NA all maps maps	Mod S on 2/3 + pvd	Low for historic
91	(Floradora), West, (Home), (Channing)	NA	NA all maps maps	Mod Inds/Fwy/D on all	Low for historic
92	Kearney, Channing, (Tuolumne), Teilman	NA	NA all maps maps	Mod mil on 1/4 + pvd	Low for historic
93	(Tuolumne), (Channing), (San Joaquin), Teilman	NA	NA all maps maps	Mod airpt on 3/4 + open	Low for historic
94	(San Joaquin), (Channing), (Amador), (Teilman)	NA	NA all maps maps	Mod airpt on all	Low for historic
95	(Amador), (Channing), El Dorado, Teilman	NA	NA all maps maps	Mod Industl on 3/4 + pvd	Low for historic
96	El Dorado, (Channing), (Ronquillo), Teilman	NA	NA all maps maps	Mod Inds/Fwy on 1/4 + pvd	Low for historic
97	(Ronquillo), (Channing), Nielsen, Teilman	NA	NA all maps maps	Mod Inds on 1/2 + pvd + ope	Low for historic
98	Nielsen, (Channing), (Nevada), Teilman	NA	NA all maps maps	Cemetery on all (Belmonta)	Low for historic
99	(Nevada), (Channing), RR, Teilman	NA	NA all maps maps	Cemetery on all (Belmonta)	Low for historic
100	RR, Channing, Franklin, Teilman	NA	NA all maps maps	Mod D/Fwy on 3/4 + open	Low for historic
101	Franklin, (Channing), Belmont, Teilman	NA	NA all maps maps	Mod Fwy/p1950 D on 3/4 + c	Low-Mod for historic
102	Belmont, (Channing), (Thomas), (Teilman)	NA	NA all maps maps	Park (Roeding) on all	Low for historic
103	(Thomas), (Channing), (Dudley), (Teilman)	NA	NA all maps maps	Park (Roeding) on all	Low for historic
104	(Dudley), (Channing), (Dennett), (Teilman)	2350	NA all maps maps	Park (Roeding) on all	Low for historic
105	(Dennett), (Channing), (Olive), (Teilman)	2350	NA all maps maps	Park (Roeding) on all	Low for historic
106	Olive, (Channing), (Hedges),(Teilman)	2603	NA all maps maps	Mod Inds/Fwy/p1960 D on 3/	Low for historic
107	(Hedges), (Channing), (Floradora), (Teilman)	NA	NA all maps maps	Mod Inds/Fwy/p1960 D on al	Low for historic
108	Kearney, Teilman, (Tuolumne), Delno	1432	NA 1885-1918, 1948: 2frHa	Mod airpt on 1/2 + pvd	Low for historic
109	(Tuolumne), (Teilman), (San Joaquin), (Delno)	NA	NA all maps maps	Mod airpt on 1/4 + pvd	Low for historic
110	(San Joaquin), (Teilman), (Amador), (Delno)	NA	NA all maps maps	pvd (airpt) on 1/2 + open	Low for historic
111	(Amador), (Teilman), El Dorado), (Delno)	NA	NA all maps maps	Mod Inds on 1/4 + pvd + ope	Low for historic
112	(El Dorado), (Teilman), (Ronquillo), (Delno)	NA	NA all maps maps	Mod Inds/Fwy on 3/4 + open	Low for historic
113	(Ronquillo), Teilman, Nielsen, (Delno)	NA	NA all maps maps	Mod Inds/Inst/Dervoir on 3/4	Low for historic
114	Nielsen, Teilman, (Nevada), (Delno)	NA	NA all maps maps	Mod Inds/Fwy/D on 3/4 + op	Low for historic
115	(Nevada), Teilman, RR, Delno	NA	NA all maps maps	Mod Inst/Fwy on 1/2 + open	Low for historic

116	RR, Teilman, Franklin, Delno	2393/2394	NA 1885-1918, 1948: 38frD	p1950 D on 3/4 + open	Low-Mod for historic
117	Franklin, Teilman, Belmont, Delno	2373	NA 1885-1918, 1948: 10frD	p1950 D/ModS on 1/2 + oper	Low for historic
118	Belmont, (Teilman), (Thomas), (Delno)	NA	NA all maps maps	Park (Roeding) on all	Low for historic
119	(Thomas), (Teilman), (Dudley), (Delno)	NA	NA all maps maps	Park (Roeding) on all	Low for historic
120	(Dudley), (Teilman), (Dennett), (Delno)	2350	NA all maps maps	Park (Roeding) on all	Low for historic
121	(Dennett), (Teilman), Olive, (Delno)	2240	NA 1885-1918, 1948:1fInst	Park on 1/2 + Fwy/Mod Inds	Low for historic
122	Kearney, (Delno), (Tuolumne), Fruit	1432	NA 1885-1918, 1948:3frHar	Mod airpt on 1/2 + pvd	Low for historic
123	(Tuolumne), (Delno), (San Joaquin), (Fruit)	NA	NA all maps maps	Mod airpt on 3/4 + open	Low for historic
124	(San Joaquin), (Delno), (Amador), (Fruit)	NA	NA all maps maps	Mod airpt on 1/4 + pvd	Low for historic
125	(Amador), (Delno), (El Doirado), (Fruit)	NA	NA all maps maps	p1950 Inds on 1/4 + open	Low for historic
126	(El Doradao), (Delno), (Ronquillo), (Fruit)	NA	NA all maps maps	Mod Inds/Fwy on 3/4 + open	Low for historic
127	(Ronquillo), (Delno), Nielsen, (Fruit)	NA	NA all maps maps	Mod Dervoir/Fwy + open	Low for historic
128	Nielsen, (Delno), (Nevada), (Fruit)	NA	NA all maps maps	Mod Fwy on 1/2 + open	Low for historic
129	(Nevada), (Delno), RR, Fruit	NA	NA all maps maps	All open	Low for historic
130	RR, Delno, Franklin, Fruit	2395/2398	NA 1885-1918, 1948:32frD,	p1950 D on all	Low-Mod for historic
131	Franlkin, Delno, Belmont, Fruit	2374/2375	NA 1885-1918, 1948:34frD,	p1950 D/ModS on 3/4 + pvd	Low-Mod for historic
132	Belmont, (Delno), (Thomas),(Fruit)	NA	NA all maps maps	Park on all	Low for historic
133	(Thomas), (Delno), (Dudley), (Fruit)	NA	NA all maps maps	Park on all	Low for historic
134	(Dudley), (Delno), (Dennett), (Fruit)	2350	NA all maps maps	Park on 1/2 + Fwy/p1960 D	Low for historic
135	Kearney, Fruit, (Tuolumne), (Arthur)	1433	NA 1885-1918, 1948:2frHar	Mod airpt on all	Low for historic
136	(Tuolumne), (Fruit), (San Joaquin), (Arthur)	NA	NA all maps maps	Mod airpt on all	Low for historic
137	(San Joaquin), (Fruit), (Amador), (Arthur)	NA	NA all maps maps	Mod Inds on 1/2 + open	Low for historic
138	Amador, Fruit, El Dorado, Arthur	NA	NA all maps maps	p1950 D on 1/2 + open	Low-Mod for historic
139	El Dorado, Fruit, (Ronquillo), Arthur	NA	NA all maps maps	p1950 D on 1/4 + open	Low-Mod for historic
140	(Ronquillo), (Fruit), Nielsen, (Arthur)	NA	NA all maps maps	Mod Fwy/Inds on 3/4 + open	Low for historic
141	Nielsen, Fruit, (Nevada), Arthur	NA	NA all maps maps	Mod Inds on 1/2 + open + pv	Low for historic
142	(Nevada), Fruit, RR, (Arthur)	NA	NA all maps maps	All open	Low for historic
143	RR, Fruit, Franklin, Arthur	NA	NA all maps maps	Mod Inds/p1960 D on 3/4 + p	Low for historic
144	Franklin, Fruit, Belmont, Arthur	NA	NA all maps maps	p1950 D on 1/2 + open	Low for historic
145	Belmont, Fruit, Thomas, Arthur	NA	NA all maps maps	Park (Roeding) on all	Low for historic
146	Thomas, Fruit, Dudley, Arthur	NA	NA all maps maps	Park on 1/2 + Mod Fwy + p1	Low for historic
147	Kearney, (Arthur), (Tuolumne), Thorne	NA	NA all maps maps	Mod airpt on all	Low for historic
148	(Tuolumne), Arthur, San Joaquin, Thorne	NA	NA all maps maps	p1950 D on 1/2 + open	Low for historic
149	San Joaquin, Arthur, Amador, Thorne	NA	NA 1885-1918, 1948:3frD,	p1950 D on 1/2 + open	Low for historic
150	Amador, Arthur, El Dorado, Thorne	1413/1415	NA 1885-1918, 1948:1frD,	p1950 D/Inds on 1/2 + open	Mod-High for historic
151	El Dorado, Arthur, (Ronquillo), Thorne	1411	NA 1885-1918, 1948:11frD,	p1950 D/Mod Fwy on 1/2 + c	Low-Mod for historic
152	(Ronquillo), (Arthur), Nielsen, (Thorne)	NA	NA all maps maps	Mod Inds/Fwy on 3/4 + open	Low for historic
153	Nielsen, Arthur, (Nevada), Thorne	NA	NA all maps maps	Mod Inds on 1/4 + pvd	Low for historic
154	(Nevada), Arthur, RR, Thorne	2404	NA 1885-1918, 1948:6frInd	p1950Inds on 1/2 + pvd + op	Mod-High for historic
155	RR, Arthur, Franklin, Thorne	2397/2400	NA 1885-1918, 1948:18frD,	Mod Inds on 1/4 + pvd + ope	Low-Mod for historic

156	Franklin, Arthur, Belmont, Thorne	2377	NA 1885-1918, 1948:16frD,	Mod Dervoir/p1950 D on 3/4	Low for historic
157	Belmont, Arthiur, Thomas, Thorne	2351	NA 1885-1918, 1948:1frS, ´	Mod Fwy/D on 3/4 + op3n	Low for historic
158	Church, Thorne, (Belgravia), Plumas	NA	NA all maps maps	p1950 D on 1/4 + open	Low for historic
159	(Belgravia), Thorne, Florence, Plumas	NA	NA all maps maps	All open - ag	Low for historic
160	Florence, Thorne, Lorena, Plumas	NA	NA all maps maps	p1950 D on 3/4 + open	Low for historic
161	Lorena, Thorne, California, Plumas	NA	NA all maps maps	p1950 D on 1/2 + open	Low-Mod for historic
162	Califronia, Thorne, Merced, Martin, Fresno	NA	NA all maps maps	p1950 Inds/D on 3/4 +	Low for historic
163	Merced, Thorne, Myers, Plumas	NA	NA all maps maps	p1960 D on 3/4 + open	Low for historic
164	Meyers, Thorne, Eden, Plumas	NA	NA all maps maps	p1960 D on 3/4 + open	Low for historic
165	Eden, Thorne, Strothers, Plumas	NA	NA all maps maps	p1960 D on 3/4 + open	Low for historic
166	Strothers, Thorne, Hawes, Plumas	321	NA 1885-1918, 1948:7frD, ˆ	p1960 D on 3/4 + open	Low for historic
167	Hawes, Thorne, Kearney, Plumas	1443	NA 1885-1918, 1948:9frD, ‡	p1960 on 3/4 + open	Low for historic
168	Kearney, Thorne, Oleander, Plumas	1821	NA 1885-1918, 1948:8frD, ˆ	p1950 D on 1/2 + open	Mod for historic
169	Oleander, Thorne, Tuolumne, Plumas	1816	NA 1885-1918, 1948:6frD	p1960 on 3/4 + open	Low for historic
170	Tuolumne, Thorne, Stanislaus, Plumas	1815	NA 1885-1918, 1948:5frD, ´	p1960 on 3/4 + open	Low for historic
171	Stanislaus, Thorne, San Joaquin, Plumas	1810	NA 1885-1918, 1948:7frD, ˆ	p1960 D on 3/4 + open	Low for historic
172	San Joaquin, Thorne, Lemon, Plumas	1809	NA 1885-1918, 1948:9frD, ‡	p1960 D on 3/4 + open	Low for historic
173	Lemon, Thorne, Amador, Plumas	1804	NA 1885-1918, 1948:9frD, ´	p1960 D on 3/4 + open	Low for historic
174	Amador, Thorne, Whites Bridge, Plumas	1803	NA 1885-1918, 1948:8frD, ´	p1960 D on 3/4 + open	Low-Mod for historic
175	Whites Bridge, Thorne, O'Neil, Plumas	380	NA 1885-1918, 1948:12frD,	p1950 D on 1/2 + open	Mod for historic
176	O'Niel, Thorne, El Dorado, Plumas	381	NA 1885-1918, 1948:12frD,	Mod D on 1/2 + open	Low for historic
177	El Dorado, Thorne, Dunn, Plumas	396	NA 1885-1918, 1948:16frD,	p1950 D on 1/2 + open	Low for historic
178	Dunn, Thorne, Yolo(/Ronquillo), Plumas	397	NA 1885-1918, 1948:12frD,	Mod D on 1/2 + Fwy	Low for historic
179	Yolo(/Ronquillo), Thorne, Divisadero(Nielsen), Plur	398	NA 1885-1918, 1948:30frD,	Mod Fwy on 3/4 + open	Low for historic
180	Divisadero, Thorne, (Nevada), Plumas	NA	NA all maps maps	p1960 Inds /canal on 1/2 + p	Low for historic
181	(Nevada), Thorne, RR, Plumas	NA	NA all maps maps	p1960 Inds on 1/2 + pvd	Low for historic
182	RR, Thorne, Franklin, Plumas	NA	NA all maps maps	Mod Inds on 1/2 + pvd	Low for historic
183	Franklin, Thorne, Belmont, Plumas	2378	NA 1885-1918, 1948:3frS	Mod Inds/rail on 1/2 + open	Low for historic
184	Church, Plumas, Belgravia, Walnut	NA	NA all maps maps	p1950 D on 1/4 + open	Low-Mod for historic
185	Belgravia, Plumas, Florence, Walnut	NA	NA all maps maps	p1950 D on 1/4 + open	Mod for historic
186	Florence, Plumas, Lorena, Walnut	NA	NA all maps maps	All open	Low for historic
187	Lorena, Plumas, California, Walnut	NA	NA all maps maps	Mod Inds on 1/2 + pvd + ope	Low for historic
188	California, Fresno, Martin, Walnut	NA	NA all maps maps	Mod Inst on 1/2 + open	Low for historic
189	Martin, Merced, Irwin, Fresno	NA	NA all maps maps	p1950 D on 3/4 + open	Low for historic
190	Merced, Plumas, Eden, Modoc	NA	NA all maps maps	p1950 D on 3/4 + open	Low for historic
191	Eden, Plumas, Strother, Modoc	NA	NA all maps maps	p1950 D on 3/4 + open	Low for historic
192	Strother, Plumas, Hawes, Modoc	308	NA 1885-1918, 1948:12frD,	p1950 D on 3/4 + open	Low for historic
193	Hawes, Plumas, Kearney, Modoc	1444	NA 1885-1918, 1948:9frD, ˆ	p1950 D on 3/4 + open	Low for historic
194	Kearney, Plumas, Oleander, Modoc	1820	NA 1885-1918, 1948:7frD, ´	p1950 D on 3/4 + open	Low for historic
195	Oleander, Plumas, Tuolumne, Modoc	1817	NA 1885-1918, 1948:12frD,	p1950 D on 3/4 + open	Low for historic

196	Tuolumne, Plumas, Staninslaus, Modoc	1814	NA 1885-1918, 1948:11frD,	p1950 D on 3/4 + open	Low-low for historic
197	Stanislaus, Plumas, San Joaquin, Modoc	1811	NA 1885-1918, 1948: 8frD,	p1950 D on 3/4 + open	Low for historic
198	San Joaquin, Plumas, Lemon, Modoc	1808	NA 1885-1918, 1948: 14frD	p1950 D on 3/4 + open	Low-Mod for historic
199	Lemon, Plumas, Amador, Modoc	1805	NA 1885-1918, 1948: 8frD,	Mod D on 3/4 + open	Low for historic
200	Amador, Plumas, Whites Bridge, Modoc	1802	NA 1885-1918, 1948: 8frD,	p1950 D on 3/4 + open	Low for historic
201	Whites Bridge, Plumas, O"Neil, Modoc	379	NA 1885-1918, 1948: 19frD	p1950 D on 3/4 + open	Low-Mod for historic
202	O'Neil, Plumas, El Dorado, Modoc	382	NA 1885-1918, 1948: 14frD	Mod D on 1/2 + open	Low for historic
203	El Dorado, Plumas, Dunn, Modoc	384	NA 1885-1918, 1948: 15frD	p1950 D on 1/2 + open	Low for historic
204	Dunn, Plumas, (Yolo/Ronquillo), Modoc	395	NA 1885-1918, 1948: park	Mod Fwy on 3/4 + open	Low for historic
205	(Yolo/Ronquillo), Plumas, Divisadero, Modoc	399/404	NA 1885-1918, 1948: 35frD	Mod Fwy/Inds on 3/4 + pvd	Low for historic
206	Divisadero, Plumas, (Nevada), Modoc	NA	NA all maps maps	Canal + pvd + open	Low for historic
207	(Nevada), Plumas, RR, Modoc	NA	NA all maps maps	Mod Inds/p1960 Inds on 1/2 ·	Low for historic
208	RR, Plumas, Franklin, Modoc	NA	NA all maps maps	Mod Inds/p1960 Inds on 1/2 ·	Low for historic
209	Church, Walnut, Belgravia, Knight	NA	NA all maps maps	Mod D on all	Low for historic
210	Belgravia, Walnut, Florence, Knight	NA	NA all maps maps	Mod Inst on 1/2 + open (ball	Low for historic
211	Florence, Walnut, Lorena, Knoight	NA	NA all maps maps	Mod Inst on 1/2 + open (ball	Low for historic
212	Lorena, Walnut, California, Knight	NA	NA all maps maps	Mod Inst on 1/2 + open + pv	Low for historic
213	California, Martin, Mariposa, Irwin, Fresno	NA	NA all maps maps	p1960 D /Mod Ch on 3/4 + o	Low for historic
214	Martin, Fresno, Irwin, Mariposa	NA	NA all maps maps	p1960 D on all	Low for historic
215	Fresno, Merced, Irwin, Jones	288	NA 1885-1918, 1948: 10frD	p1960 D on 3/4 + open	Low for historic
216	Merced, Modoc Strother, Trinity	NA	NA all maps maps	p1960 D on 3/4 + open	Low for historic
217	Strother, Modoc, Hawes, Trinity	302	NA 1885-1918, 1948: 13frD	p1950 D on 3/4 + open	Low for historic
218	Hawes, Modoc, Kearney, Trinity	320	NA 1885-1918, 1948: 10frD	p1950 D on 3/4 + open	Low for historic
219	Kearney, Modoc, Oleander, Trinity	1819	NA 1885-1918, 1948: 9frD,	p1950 D on 3/4 + open	Low for historic
220	Oleander, Modoc, Tuolumne, Trinity	1818	NA 1885-1918, 1948: 13frD	p1950 D on 3/4 + open	Low for historic
221	Tuolumne, Modoc, Stanislaus, Trinity	1813	NA 1885-1918, 1948: 11frD	p1950 D on 3/4 + open	Low for historic
222	Stanislaus, Modoc, San Joaquin, Trinity	1812	NA 1885-1918, 1948: 13frD	p1950 D on 3/4 + open	Low for historic
223	San Joaquin, Modoc, Lemon, Trinity	1807	NA 1885-1918, 1948: 10frD	p1950 D/ModS on 3/4 + ope	Low for historic
224	Lemon, Modoc, Amador, Trinity	1806	NA 1885-1918, 1948: 11frD	p1950 D on 3/4 + open	Low-Mod for historic
226	Amador, Modoc, Whites Bridge, Trinity	1801	NA 1885-1918, 1948: 12frD	p1950 D on 3/4 + open	Mod for historic
227	Whites Bridge, Modoc, O'Neil, Trinity	378	NA 1885-1918, 1948: 14frD	p1950 D on 3/4 + open	Low-Mod for historic
228	O'Neil, Modoc, El Dorado, Trinity	383	NA 1885-1918, 1948: 11frD	p1950 D on 3/4 + open	Low for historic
229	El Dorado, Modoc, Dunn, Trinity	385	NA 1885-1918, 1948: 16frD	Mod D/Fwy on 3/4 + open	Low for historic
230	Dunn, Modoc, (Yolo/Ronquillo), Trinity	394	NA 1885-1918, 1948: 10frD	Mod Inds/Fwy on 3/4 + pvd	Low for historic
231	(Yolo/Ronquillo), Modoc, Divisadero, Trinity	400/403	NA 1885-1918, 1948: 40frD	Mod Inds on 1/2 + pvd	Low for historic
232	Divisadero, Modoc, (Nevada), Trinity	NA	NA all maps maps	Mod Inds/Fwy canal on 3/4 +	Low for historic
233	(Nevada), Modoc, RR, Trinity	NA	NA all maps maps	All open	Low for historic
234	RR, Modoc, Weber/NH, Trinity	2387	NA 1885-1918, 1948: 1con	Mod Inds/RR on 3/4 + open	Low for historic
235	Church, Knight ,Belgravia, Fairview	NA	NA all maps maps	Mod D on all	Low for historic
236	Belgravia, Knight, (Florence), Fairview	NA	NA all maps maps	Mod Inst on 3/4 + pvd	Low for historic

237	(Florence), Knight, (Lorena), Fairview	1100/1102	NA	1885-1918, 1948: 1fr In	Mod Inst on 1/2 + pvd + ope	Low for historic
238	(Lorena), Knight, California, Fairview	1098/1102	NA	1885-1918, 1948: 3frIns	Mod Inst on 3/4 + pvd	Low for historic
239	California, Tulare, Jones, Kern	264	NA	1885-1918, 1948: 2frD	Mod D on 3/4 + open	Low for historic
240	Tulare, Irwin, Mariposa, Jones	266	NA	1885-1918, 1948: 10frD	p1960 D on 3/4 + open	Low for historic
241	Mariposa, Irwin, Fresno, Jones	281	NA	1885-1918, 1948: 10frD	p1960 D/ModS on 3/4 + ope	Low for historic
242	Fresno, Jones, Merced, Klette	289	NA	1885-1918, 1948: 10frD	p1960 D on 3/4 + open	Low for historic
243	California, Kern, Klette	250	NA	1885-1918, 1948: 1frD	All open	Low-Mod for historic
244	Kern, Jones, Tulare, Klette	263	NA	1885-1918, 1948: 8frD,	Mod D on 3/4 + open	Low for historic
245	Tulare, Jones, Mariposa, Klette	267	NA	1885-1918, 1948: 12frD	p1950 D on 3/4 + open	Low for historic
246	Mariposa, Jones, Fresno, Klette	280	NA	1885-1918, 1948: 6frD,	p1960 D on 3/4 + open	Low for historic
247	Fresno, Klette, Merced, Waterman	290	NA	1885-1918, 1948: 14frD	p1950 D on 3/4 + open	Low for historic
248	Merced, Trinity, Strother	NA	NA	all maps maps	All open	Low for historic
249	Strother, Trinity, Hawes, Stephens	301	NA	1885-1918, 1948: 8frD,	p1950 D on 3/4 + open	Low for historic
250	Hawes, Trinity, Kearney, Stephens	309	NA	1885-1918, 1948: 12frD	p1950 D on 3/4 + open	Low for historic
251	Kearney, Trinity, Oleander, Stephens	310	NA	1885-1918, 1948: 1frD,	p1950 D/Ch on 1/2 + open	Low for historic
252	Oleander, Trinity, Tuolumne, Stephens	311	NA	1885-1918, 1948: 1frCh	Mod Ch on 1/4 + pvd	Low for historic
253	Tuolumne, Trinity, Stanislaus, Stephens	318	NA	1885-1918, 1948: 10frD	p1950 on 3/4 + open	Low for historic
254	Stanislaus, Trinity, A St	327	NA	1885-1906; 1918: 1frD,	Mod Inst on 1/2 + pvd + ope	Low-Mod for historic
255	Calaveras, A St, San Joaquin, B St	329	NA	1885-1906; 1918: 9frD,	p1960 D on 3/4 + open	Low-Mod for historic
256	San Joaquin, A St, Amador, B St	351	NA	1885-1898; 1906: 1brkS	Mod D on 3/4 + open	Low-Mod for historic
257	Amador, Trinity, B St	361	NA	1885-1918; 1948: 2frS	All open	Low-Mod for historic
258	San Joaquin, B St, Amador, C St	350	NA	1885-1918; 1948: 12frD	p1960 D/S on 3/4 + open	Low for historic
	Amador, B St, Trinity, C St	362	NA	1885-1906; 1918: 1frIns	p1918 park	Low for historic
259	Amador, C St, Trinity, 99 Fwy	363/376	NA	1885-1906; 1918: 6frD,	Mod Fwy on 1/4 + open (par	Mod for historic
260	(Sacramento), 99 Fwy, El Dorado, E St	375	NA	1885-1898; 1906: 3frD,	Mod Inst on 3/4 + pvd	Low-Mod for historic
261	El Dorado, 99 Fwy, (Trinity), (Yolo), E St	387	NA	1885-1906; 1918: 5frD,	Mod Inds/S on 1/4 + pvd	Low-Mod for historic
262	El Dorado, (E St), (Yolo), (F St)	388	NA	1885-1906; 1918: 2frD,	Mod Inst/S on 1/2 + pvd	Low for historic
263	(Yolo), E St, (Trinity), (Boles), (F St)	392	NA	1885-1906; 1918: 4frD,	Mod Inst/S on 3/4 + pvd	Low for historic
264	180 Fwy, G St, Arroyo, RR	NA	NA	all maps maps	Mod Inds on 1/4 + pvd + ope	Low for historic
265	Arroyo, RR, Franklin, Weber/H	2383	NA	1885-1918; 1948: 1con	p1950 Inds on all	Low for historic
266	(Boles), (Trinity), 180 Fwy, G St	401/402	NA	1885-1918; 1948: 1frS	Mod Inst on 1/4 + pvd	Low for historic
267	Church, Fairview, Belgravia, (Maud)	NA	NA	all maps maps	Mod Inst on 1/2 + open (park	Low for historic
268	Belgravia, Fairview, Florence, (Maud)	NA	NA	all maps maps	All open (park)	Low for historic
269	Florence, Fairview, Lorena, Maud	1096/1097	NA	1885-1906; 1918: 8frD,	Mod D on 3/4 + open	Low for historic
270	Lorena, Fairview, California, Maud	1094/1095	NA	1885-1906; 1918: 8frD,	Mod D on 3/4 + open	Low for historic
271	California, Klette, Kern, Waterman, Inyo	251	NA	1885-1918; 1948: 4frD,	p1950 Sch/Mod D on 1/4 + c	Mod for historic
272	Kern, Klette, Tulare, Waterman	262	NA	1885-1918; 1948: 7frD,	p1960 D/S on 3/4 + open	Low for historic
273	Tulare, Klette, Mariposa, Waterman	268	NA	1885-1918; 1948: 9frD,	p1950 D on 3/4 + open	Low for historic
274	Mariposa, Klette, Fresno, Waterman	279	NA	1885-1906; 1918: 1frD,	p1950 D on 3/4 + open	Low for historic
275	Fresno, Waterman, Merced, Pottle	291	NA	1885-1906; 1918: 3frD,	p1950 D on 3/4 + open	Low for historic

276	Kern, Waterman, Tulare, Pottle	261	NA 1885-1906; 1918: 1frD,	Mod D/Inst on 3/4 + open	Low-Mod for historic
277	Tulare, Waterman, Mariposa, Pottle	269	NA 1885-1918; 1948: 8frD,	p1960 D on 3/4 + open	Low for historic
278	Mariposa, Waterman, Fresno, Pottle	278	NA 1885-1918; 1948: 8frD,	p1950 D on 3/4 + open	Low for historic
279	Fresno, Pottle, Merced, Collins	292	NA 1885-1906; 1918: 1frSc	p1950 D on 3/4 + open	Low for historic
280	Merced, Stephens, Kearney, Pickford	300	NA 1885-1906; 1918: 2frD,	p1950 D on 3/4 + open	Low for historic
281	Kearney, Stephens, Oleander, Pickford	299	NA 1885-1906; 1918: 4frD,	p1950 D on 3/4 + open	Low for historic
282	Oleander, Stephens, Tuolumne, Pickford	312	NA 1885-1918; 1948: 8frS,	p1950 D on 3/4 + open	Low for historic
283	Tuolumne, Stephens, Stanislaus, Pickford	317	NA 1885-1918; 1948: 12frS	p1950 D on 3/4 + open	Low for historic
284	Stanislaus, A St, Calaveras, B St	315	NA 1885-1906; 1918: 15frD	p1950 D on 3/4 + open	Low for historic
285	Calaveras, B St, San Joaquin, C St	330	NA 1885-1918; 1948: 11frD	p1950/Mod D on 3/4 + open	Low for historic
286	San Joaquin, C St, Amador, 99 Fwy	349	NA 1885-1898; 1906: 7frD,	p1950 D on 1/2 + open	Low-Mod for historic
287	Amador, 99 Fwy, Sacramento, E St	364	NA 1885-1888; 1898: 3frD,	Mod Inst on 1/2 + pvd	Mod for historic
288	(Sacramento), E St, El Dorado, (F St)	374	NA 1885-1888; 1898: 7frD,	Open + pvd on all	Mod for historic
289	El Dorado, (F St), (Yolo), G St	389	NA 1885-1918; 1948: 1brkl	All pvd	Mod for historic
290	(Yolo), (F St), (Boles), G St	391	NA 1885-1906; 1918: 1frD,	Mod Inst on 1/4 + pvd	Low for historic
291	Divisadero, G St, 180 Fwy, RR	681	NA all maps maps	Mod Inst on 1/2 + pvd	Low for historic
292	180 Fwy, RR, Arroyo, H/Weber	2387	NA all maps maps	Canal + pvd + open	Low for historic
293	Church, Maud, Belgravia, Lee	NA	NA all maps maps	Mod D on 3/4 + open	Low for historic
294	Belgravia, Maud, Florence, Lee	NA	NA all maps maps	All open	Low for historic
295	Florence, Maud, Lorena, Lee	551/1093	NA 1885-1906; 1918: 6frD,	Mod D on 3/4 + open	Low for historic
296	Lorena, Maud, California, Lee	550	NA 1885-1906; 1918 5frD,	Mod D on 3/4 + open	Low for historic
297	California, Inyo, Waterman	354	NA all maps maps	Mod S on 1/2 + pvd	Low for historic
298	Inyo, Waterman, Kern, Pottle	252	NA 1885-1918; 1948: 10frD	p1950 D on 3/4 + open	Low for historic
299	Kern, Pottle, Tulare, Collins	260	NA 1885-1918; 1948: 21frD	p1950 D on 3/4 + open	Low for historic
300	Tulare, Pottle, Mariposa, Collins	270	NA 1885-1918; 1948: 10frD	p1950 D on 3/4 + open	Low for historic
301	Mariposa, Pottle, Fresno, Collins	277	NA 1885-1906; 1918: 1frD;	p1960 D/Ch on 3/4 + open	Low for historic
302	Fresno, Collins, Kearney	293	NA 1885-1906; 1918: 5frD,	p1960 D on 1/2 + open + pv	Low for historic
303	Kearney, Pickford, Oleander, Snow	298	NA 1885-1906; 1918: 3frD,	p1950 D on 3/4 + open	Low for historic
304	Oleander, Pickford Toulumne, Snow	297	NA 1885-1918; 1948: 9frD,	p1950 D/Ch on 3/4 + open	Low for historic
305	Tuolumne, Pickford, A St	313	NA 1885-1918; 1948: 2frD,	Mod D on 1/2 + open	Low for historic
306	Tulare, Collins, Mariposa, Mayor	271	NA 1885-1906; 1918: 6frD,	Mod D on 3/4 + open	Low for historic
307	Mariposa, Collins, Fresno, Mayor	276	NA 1885-1906; 1918: 8frD,	p1950 D/Club on 1/2 + open	Low-Mod for historic
308	Kearney, Merced, A St	294	NA 1885-1918; 1948: 1frD,	p1950 D/Hosp on 1/2 + oper	Low for historic
309	Merced, Snow, A St	355/356	NA 1885-1906; 1918: 2frD;	p1950 D on 1/2 + open	Low for historic
310	Merced, A St, Toulumne, B St	296	NA 1885-1898; 1906: 6frD,	p1950 D on 3/4 + open	Low for historic
311	Tuolumne, A St, Stanislaus, B St	314	NA 1885-1906; 1918: 5frD,	p1950 D/ModS on 3/4 + ope	Low for historic
312	White Bridges, B St, Calaveras, C St	1	NA 1885-1898; 1906: 11frD	p1950 D on 3/4 + open	Low-Mod for historic
313	Calaveras, C St, San Joaquin, 99 Fwy	331	NA 1885-1888; 1898: 7frD,	p1960 D/Mod Fwy on 3/4 + c	Mod for historic
314	San Joaquin, 99 Fwy, Amador, E St	348	NA 1885-1918; 1948: 16frD	Mod S/Hwy on 3/4 + pvd	Low for historic
315	(Amador), E St, (Sacrameno), (F St)	365	NA 1885-1888; 1898: 8frD,	Mod Inst on all	Low for historic

316	Sacramento, F St, El Dorado, G St	373	NA 1885-1888; 1898: 2frD,	Mod Inst on 3/4 + pvd	Low for historic
317	Calaveras, E St, San Joaquin, F St	333	NA 1885-1888; 1898: 8frD,	Mod Inst on all	Low for historic
318	Calaveras, F St, San Joaquin, G St	334	NA 1885-1888; 1898: 6frD,	All pvd	Mod-High for historic
319	Calaveras, G St, San Joaquin, RR	526	NA 1885-1888; 1898: 3-frRI	Mod Inds on 3/4 + pvd	Low-Mod for hist. RR
320	Calaveras, RR, San Joaquin, H St	506	NA 1885-1888; 1898: RRtr;	p1950 S on 1/2 + open	Low-Mod for historic
321	(San Joaquin), E St, (Amador), (F St)	347	NA 1885-1888; 1898: 2frD,	Mod Inds on 3/4 + pvd	Low-Mod for historic
322	(San Joaquin), (F St), (Amador), G St	346	NA 1885-1888; 1898: 2frD,	Mod S on 1/2 + pvd	Low-Mod for historic
323	(San Joaquin), G St, (Amador), RR	525	NA 1885-1888; 1898: 2-frRI	Mod Inds on 1/2 + pvd	Low-Mod for historic
324	(San Joaquin), RR, (Amador), H St	505	NA 1885-1888; 1898: RRtr;	All open + pvd	Low for historic
325	(Amador), (F St), (Sacramento), G St	366	NA 1885-1888; 1898: 9-frD,	Mod Inst on 1/2 + pvd	Low-Mod for historic
326	(Amador), G St, (Sacramento), RR	524	NA 1885-1888; 1898: RRtr;	Mod Inds on 3/4 + pvd	Low for historic
327	(Amador), RR, (Sacramento), H St	504	NA 1885-1898; 1906: 3-frIn	p1960Inds on 1/4 + open	Mod-High for historic
328	(Sacramento), (F St), El Dorado, G St	373	NA 1885-1888; 1898: 2frD,	Mod Inst/S on 3/4 + pvd	Low for historic
329	(Sacramento), G St, El Dorado, RR	323	NA 1885-1888; 1898: mult-I	Mod Inst on all	Low for historic
330	(Sacramento), RR, El Dorado, H St	503	NA 1885-1906; 1918: mult-I	Mod Inds on 1/4 +open	Low for historic
331	El Dorado, G St, (Yolo), RR	522	NA 1885-1906; 1918: mult-I	Mod Inst on 3/4 + pvd	Low for historic
332	El Dorado, RR, (Yolo), H St	502	NA 1885-1906; 1918: mult-I	All open	Mod-High for historic
333	(Yolo), G St, Divisadero, RR	521	NA 1885-1898; 1906: 3frO;	Mod Inds on 1/2 + pvd	Mod for historic
334	(Yolo), RR, Divisadero, H St	501	NA 1885-1898; 1906: 5-frD,	p1950 Inds on 1/4 + open	Mod-High for e 20 C historic
335	Divisadero, RR, 180 Fwy, H St	680	NA 1885-1898; 1906: 4-frD,	All open	Mod-High for e20 C historic
336	Roosevelt, H St, 180 Fwy	717	NA 1885-1898; 1906: 2-frD,	All open	Low-Mod for historic
337	Church, Lee, Belgravia, ML King	NA	NAall maps	Mod D on 3/4 + open	Low for historic
338	Belgravia, Lee, Florence, ML King	1092	NA 1885-1906; 1918:1-frD,	Mod D on 3/4 + open	Low for historic
339	Florence, Lee, Lorena, ML King	1091/1092	NA 1885-1906; 1918: 10-frI	Mod D on 3/4 + open	Low for historic
340	Lorena, Lee, California, ML King	1090	NA 1885-1906; 1918: 5-frD,	Mod D/S on 3/4 + open + pv	Low for historic
341	California, Waterman, Inyo, Pottle	249	NA 1885-1906; 1918: 1-frO	p1950 D on 3/4 + open	Low-Mod for historic
342	Inyo, Pottle, Kern, Collins	253	NA 1885-1918; 1948: 9-frD,	p1950/Mod D on 3/4 + open	Low-Mod for historic
343	Kern, Collins, Tulare, Mayor	259	NA 1885-1918; 1948: 21-frI	p1950 D on 3/4 + open	Low for historic
344	Tulare, Mayor, Mariposa, A St	272	NA 1885-1906; 1918: 16-frI	p1950 D/S on 3/4 + open	Low for historic
345	Mariposa, Mayor, Fresno, A St	275	NA 1885-1906; 1918: 3-frD,	p1950/Mod D/S on 3/4 + ope	Low for historic
346	Mariposa, A St, Fresno, B St	274	NA 1885-1898; 1906: 7-frD,	p1950/Mod D/S on 1/2 + ope	Mod for historic
347	Fresno, A St, Merced, B St	295	NA 1885-1898; 1906: 10-frI	p1950 D/ModS on 1/2 + pvd	Mod-High for historic
348	Fresno, B St, Merced, C St	4	NA 1885-1898; 1906: 17-frI	Mod S on 1/2 + pvd	Mod for historic
349	Fresno, C St, Merced, 99 Fwy	19	NA 1885-1898; 1906: 22-frI	Mod S/Hwy on 3/4 + pvd	Low for historic
350	Merced, B St, Tuolumne, C St	3	NA 1885-1888; 1898: 4-frD,	Mod S on 3/4 + pvd	Low for historic
351	Merced, C St, Tuolumne, 99 Fwy	20	NA 1885-1888; 1898: 7-frD,	Mod Inst/Hwy on 3/4 + pvd	Low for historic
352	Tuolumne, B St, Whites Bridge, C St	2	NA 1885-1898; 1906: 1-frD,	p1950 D on 1/2 + open	Mod for historic
353	Tuolumne, C St, Whites Bridge, 99 Fwy	21	NA 1885-1888; 1898: 5-frD,	Mod Inds/Hwy on 1/2 + pvd	Low for historic
354	Whites Bridge, C St, Calaveras, 99 Fwy	22	NA 1885-1888; 1898: 2-frD,	p1960 D/Hwy on 3/4 + open	Low for historic
355	Church, ML King, Belgravia, Weller	NA	NA all maps maps	Mod D on 3/4 + open	Low for historic

356	Belgravia, ML King, Florence, Weller	NA	NA all maps maps	Mod D	on 3/4 + open	Low for historic
357	Florence, ML King, Lorena, Weller	715/1089	NA 1885-1906; 1918: 2-frD,	Mod Inst	on 1/2 + open	Low-Mod for historic
358	Lorena, ML King, California, Weller	1088	NA 1885-1906; 1918: 10-frI	Mod D	on 3/4 + open	Low for historic
359	California, Pottle, Mono, Collins	241	NA 1885-1906; 1918: 11-frI	Mod D	on 3/4 + open	Low for historic
360	Mono, Pottle, Inyo, Collins	248	NA 1885-1918; 1948: 12-frI	p1950 D	on 3/4 + open	Low for historic
361	Mono, Collins, Inyo, Mayor	247	NA 1885-1906; 1918: 1-frD;	p1950 D	on 3/4 + open	Low for historic
362	Inyo, Collins, Kern, Mayor	254	NA 1885-1918; 1948: 4-frD,	p1950/Mod D	on 3/4 + open	Low for historic
363	Inyo, Mayor, Kern, A St	255	NA 1885-1906; 1918: 8-frD,	p1960 D	on 3/4 + open	Low for historic
364	Kern, Mayor, Tulare, A St	258	NA 1885-1906; 1918: 6-frD,	p1960 D/Mod S	on 3/4 + ope	Low for historic
365	Kern, A St, Tulare, B St	257	NA 1885-1898; 1906: 1-frD,	p1950/Mod D	on 3/4 + open	Low-Mod for historic
366	Tulare, A St, Mariposa, B St	273	NA 1885-1898; 1906: 4-frD,	p1950 D/Mod S	on 3/4 + ope	Mod for historic
367	Tulare, B St, Mariposa, C St	6	NA 1885-1898; 1906: 4-frD,	p1950/Mod D/p1950Ch/Mod		Mod for historic (Chinese)
368	Mariposa, B St, Fresno, C St	5	NA 1885-1898; 1906: 12-frI	p1950 D/S	on 1/2 + open + p	Mod-High for historic
369	Mariposa, C St, Fresno, 99 Fwy	18	NA 1885-1918; 1948: 1-con	Mod S/Hwy	on 1/2 + pvd	Low for historic
370	Church, Weller, Belgravia, Bardell	NA	NA all maps maps	Mod D	on 3/4 + open	Low for historic
371	Belgravia, Weller, Florence, Bardell	NA	NA all maps maps	Mod D	on 3/4 + open	Low for historic
372	Florence, Weller, Lorena, (Bardell)	1087	NA 1885-1918; 1948: 1-frD	Mod Inst/park	on 1/2 + open	Low for historic
373	Lorena, Weller, California, Bardell	1086	NA 1885-1906; 1918: 18-frI	p1950/Mod D	on 3/4 + open	Low for historic
374	California, Collins, Mono, Mayor	240/242	NA 1885-1906; 1918: 18-frI	p1950/Mod D	on 3/4 + open	Low-Mod for historic
375	Mono, Mayor, Inyo, A St	246	NA 1885-1906; 1918: 1-frD,	p1950 Inst	on 1/2 + open	Low for historic
376	Inyo, A St, Kern, B St	256	NA 1885-1906; 1918: 2-frD,	p1950 D	on 3/4 + open	Low for historic
377	Kern, B St, Tulare, C St	7	NA 1885-1898; 1906: 10-frI	p1950/Mod D	on 1/2 + open	Mod-High for historic
378	Tulare, C St, Mariposa, 99 Fwy	17	NA 1885-1888; 1898: 1-frD,	Mod S/Hwy	on 1/2 + pvd + o	Low-Mod for historic
379	Church, Bardell, Belgravia, Tupman	NA	NA all maps maps	Mod D	on 3/4 + open	Low for historic
380	Belgravia, Bardell, Florence, Tupman	NA	NA all maps maps	Mod D	on 3/4 + open	Low for historic
381	Florence, Bardell, Lorena, Tupman	NA	NA all maps maps	Mod D	on 3/4 + open	Low for historic
382	Lorena, Bardell, California, Tupman	1084	NA 1885-1906; 1918: 18-frI	Mod D	on 3/4 + open	Low-Mod for historic
383	Ventura, Mayor, Mono, A St	243	NA 1885-1906; 1918: 17-frI	p1950/Mod D	on 3/4 + open	Low-Mod for historic
384	Mono, A St, Inyo, B St	245	NA 1885-1898; 1906: 1-frD,	p1950 D	on 3/4 + open	Low for historic
385	Inyo, B St, Kern, C St	8	NA 1885-1898; 1906: 4-frD,	p1950/Mod D	on 3/4 + open	Low for historic
386	Kern, C St, Tulare, 99 Fwy	16	NA 1885-1898; 1906: 1-frD,	p1950/Mod D/Inds	on 1/4 + (	Mod-High for historic
387	Divisadero, College, Voorman, Park	635	NA 1885-1888; 1898: 3-frD,	p1950 D/S	on all	Low for historic
388	Voorman, College, Nevada, Park	633	NA 1885-1888; 1898: 10-frI	p1950 D	on 3/4 + open	Low for historic
389	Nevada, College, McKenzie, Park	698	NA 1885-1888; 1898: 4-frD,	p1950 D	on 3/4 + open	Low for historic
390	McKenzie, College, Franklin, Park	644	NA 1885-1888; 1898: 6-frD,	p1950 D	on 3/4 + open	Low for historic
391	Franklin, College, 180 Fwy, Park	696	NA 1885-1898; 1906: 12-frI	p1950 D/Mod Hwy	on 3/4 + (	Low for historic
392	Church, Tupman, Belgravia, S Clara	NA	NA all maps maps	p1960/Mod D	on 3/4 + open	Low for historic
393	Belgravia, Tupman, (Florence), S Clara	NA	NA all maps maps	p1960/Mod D	on 3/4 + open	Low for historic
394	(Florence), Tupman, Lorena, S Clara	1085	NA 1885-1918; 1948: 5-frD,	Mod D	on 3/4 + open	Low for historic
395	Lorena, Tupman, California, S Clara	1082	NA 1885-1906; 1918: 11-frI	Mod D	on 3/4 + open	Low for historic

396	California, Mayor, Ventura, A St	239	NA 1885-1906; 1918: 17-frI	Mod D on 3/4 + open	Low for historic
397	Ventura, A St, Mono, (B St)	244	NA 1885-1906; 1918: 9-frS	Mod Sch on 3/4 + open	Low for historic
398	Mono, B St, Inyo, C St	9	NA 1885-1898; 1906: 5-frD,	p1950/Mod D on 3/4 + open	Low for historic
399	Inyo, C St, Kern, 99 Fwy	15	NA 1885-1888; 1898: 2-frD	p1950/Mod D/Ch/Hwy on 3/4	Low-Mod for historic
400	Divisadreo, Park, Voorman, Poplar	636	NA 1885-1898; 1906: 2-frD;	p1950 D/Mod S on 3/4 + ope	Low for historic
	Voorman, Park, McKenzie, Poplar	628	NA 1885-1888; 1898: 13-frI	Mod Sch on 1/2 + open	Mod-High for historic
	McKenzie, Park, Franklin, Poplar	626/627	NA 1885-1888; 1898: 9-frD,	p1950 D on 3/4 + open	Low for historic
	Franklin, Park, 180 Fwy, Poplar	626	NA 1885-1888; 1898: 2-frD,	p1950/Mod D on 3/4 + open	Mod for e20th C S historic
	Church, S Clara, Belgravia, Eunice	NA	NA all maps maps	Mod D on 3/4 + open	Low for historic
	Belgravia, S Clara, Riggins, Eunice	NA	NA all maps maps	Mod D on 3/4 + open	Low for historic
	Riggins, S Clara, Lorena, Eunice	1080	NA 1885-1898; 1906: 8-frD,	Mod D on 3/4 + open	Low for historic
	Lorena, S Clara, California, Eunice	1079	NA 1885-1898; 1906: 4-frD,	Mod D on 3/4 + open	Low for historic
	S Clara, A St, Ventura, B St	238	NA 1885-1898; 1906: 8-frD,	Mod D on 3/4 + open	Low for historic
	Ventura, B St, Mono, C St	10	NA 1885-1898; 1906: 1-brS	All open + pvd	Mod-High for historic Sch
	Mono, C St, Inyo, 99 Fwy	14	NA 1885-1885; 1888: 9-frD,	p1950 D/Mod Hwy on 3/4 + (	Mod for historic D
	Divisadero, Poplar, Voorman, S Pablo	699	NA 1885-1888; 1898: 1-frD,	p1950/Mod D on 1/2 + open	Mod for historic D
	Voorman, Poplar, McKenzie, S Pablo	624	NA 1885-1888; 1898: 8-frD,	p1950 D on 3/4 + open	Low for historic
	McKenzie, Poplar, Klondyke, S Pablo	623	NA 1885-1888; 1898: 12-frI	p1950 D on 3/4 + open	Low for historic
	Klondyke, Poplar, Belmont/180 Fwy, S Pablo	622	NA 1885-1888; 1898: 7-frD,	p1950 D on 3/4 + open	Low for historic
	Church, Eunice, Belgravia, Ivy	NA	NA all maps maps	Mod D on 3/4 + open	Low for historic
	Belgravia, Eunice, Riggins, Ivy	NA	NA all maps maps	Mod D on 3/4 + open	Low for historic
	Riggins, Eunice, Lorena, Ivy	1077	NA 1885-1898;1906: 9-frD,	p1950/Mod D on 3/4 + open	Low for historic
	Lorena, Eunice, California, Ivy	1076	NA 1885-1898; 1906: 9-frD,	p1950/Mod D/Ch on 3/4 + op	Low for historic
	California, A St, S Clara, B St	237	NA 1885-1898; 1906: 4-frD,	Mod D on 3/4 + open	Low for historic
	S Clara, B St, Ventura, C St	11	NA 1885-1898; 1906: 9-frD,	p1950 D devl on 3/4 + open	Mod for historic D
	Ventura, C St, Mono, 99 Fwy	13	NA 1885-1888; 1898: 7-frD,	p1950 D/Mod Hwy on 3/4 + (	Low for historic
	Divisadero, S Pablo, Voorman, Glenn	620	NA 1885-1888; 1898: 3-frD,	Mod Ch/S on 3/4 + pvd	Low for historic
	Voorman, S Pablo, McKenzie, Glenn	619	NA 1885-1888; 1898: 21-frI	p1950 D on 3/4 + open	Low for historic
	McKenzie, S Pablo, Belmont, Glenn	617/618	NA 1885-1888; 1898: 9-frD,	p1950 D on 3/4 + open	Low for historic
	Belmont, S Pablo, 180 Fwy, Glenn	612	NA 1885-1898, 1919; 1906:	Mod S/Hwy on 1/2 + open	Low for historic
	Church, Ivy, Belgravia, Geneva	NA	NA all maps maps	Mod D on 3/4 + open	Low for historic
	Belgravia, Ivy, Riggins, (Geneva)	NA	NA all maps maps	Mod Ch on 1/4 + pvd + open	Low for historic
	Riggins, Ivy, Lorena, Geneva	1074	NA 1885-1898; 1906: 9-frD,	p1950/Mod D on 3/4 + open	Low for historic
	Lorena, Ivy, B St, Geneva	1073	NA 1885-1898; 1906: 13-frI	Mod D on 3/4 + open	Low for historic
	S Benito, B St, S Clara, C St	235	NA 1885-1898; 1906: 15-frI	p1950/Mod D on 3/4 + open	Low-Mod for historic Inds
	S Clara, C St, Ventura, 99 Fwy	12	NA 1885-1898; 1906: 7-frD,	p1950 D/Mod Hwy on 1/2 + (	Mod for historic D
	Divisadero, Glenn, Voorman, Calaveras	616	NA 1885-1898; 1906: 1-frD,	p1950 D/Mod S on 3/4 + pvc	Low for historic
	Voorman. Glenn, McKenzie, Calaveras	615	NA 1885-1888; 1898: 8-frD,	p1950 D on 3/4 + open	Lod-Mod for historic D
	McKenzie, Glenn, Belmont, Calaveras	613/614	NA 1885-1888; 1898: 12-frI	p1950/Mod D on 3/4 + open	Low-Mod for historic D
	Belmont, Glenn, 180 Fwy, Calaveras	606	NA 1885-1898; 1906: 5-frD,	Mod S/D/Hwy on 1/2 + open	Mod for historic D

Church, Geneva, Belgravia, Elm	NA	NA all maps maps	Mod Inds on 1/4 + open	Low for historic
Belgravia, Geneva, Riggins, Elm	NA	NA all maps maps	p1950 D on 1/4 + open	Low-Mod for historic
Riggins, Geneva, Lorena, Elm	1071	NA 1885-1898; 1906: 5-frD,	p1950 D/Mod S on 1/2 + ope	Mod for historic D
Lorena, Geneva, Elm	1070	NA 1885-1898; 1906: 4-frD,	Mod D/Hwy on 3/4 + pvd	Low-Mod for historic D
California, B St, S Benito, C St	236	NA 1885-1898; 1906: 8-frD,	Mod Inst on 1/4 + pvd	Low-Mod for historic D
S Benito, C St, S Clara, 99 Fwy	234	NA 1885-1898; 1906: 17-frD	p1950/Mod D /Mod Hwy on 3	Low for historic
Divisadero, Calaveras, Voorman, Blackstone	610	NA 1885-1888; 1898: 1-frD,	p1950/Mod park on 1/4 + op	Mod for historic D/S (BlSm)
Voorman, Calaveras, McKenzie, Blackstone	609	NA 1885-1888; 1898: 14-frD	p1950/Mod D on 3/4 + open	Low for historic
McKenzie, Calaveras, Belmont, Blackstone	607/608	NA 1885-1888; 1898: 16-frD	p1950 D/Mod S on 3/4 + ope	Low-Mod for historic
Belmont, Calaveras, 180 Fwy, Blackstone	606	NA 1885-1888; 1898: 1-brS	p1950 Apt/Mod S on 1/4 + op	Mod-High for historic S/D
Church, Elm, Belgravia, Poppy	NA	NA all maps maps	Mod D on 1/2 + open	Low for historic
Belgravia, Elm, Riggins, Poppy	NA	NA all maps maps	Mod D on 1/2 + open	Low for historic
Riggins, Elm, Lorena, Poppy	875	NA 1885-1906; 1918: 9-frD,	p1950/Mod D on 1/2 + open	Low-Mod for historic S/D
Lorena, Elm, California, Poppy	872	NA 1885-1906; 1918: 17-frD	p1950 D/Mod Inst on 1/2 + o	Mod for historic D/S
California, C St, San Benito, 99 Fwy	233	NA 1885-1888; 1898:6-frD,	Mod Inst/Hwy on 3/4 + pvd +	Low for historic
Divisadero, Blackstone, Illinois, Abby	604	NA 1885-1888; 1898: ; 190	p1950/Mod S on 1/2 + pvd	Mod-High for historic D/S
Illinois, Blackstone, McKenzie, Abby	603	NA 1885-1888; 1898: ; 190	Mod S on 1/2 + pvd	Mod-High for historic D
McKenzie, Blackstone, Grant, Abby	602	NA 1885-1888; 1898: ; 190	Mod D/S on 1/2 + pvd	Mod-High for historic D
Grant, Blackstone, Belmont, Abby	601	NA 1885-1888; 1898: ; 190	p1950/Mod D/S on 3/4 + pvc	Mod for historic D/S
Belmont, Blackstone, 180 Fwy, Abby	600	NA 1885-1888; 1898: ; 190	p1950/Mod D/S on 1/2 + ope	Mod for historic D/S
Church, Poppy, Belgravia, Holly	NA	NA all maps maps	p1950/Mod D on 3/4 + open	Low for historic
Belgravia, Poppy, Riggins, Holly	NA	NA all maps maps	p1950 D on 3/4 + open	Low for historic
Riggins, Poppy, Lorena, Holly	876	NA 1885-1906; 1918: ; 194	p1950 D on 3/4 + open	Low for historic
Lorena, Poppy, California/99 Fwy, Holly	873	NA 1885-1906; 1918: ; 194	p1950 D on 3/4 + open	Low-Mod for historic
Divisadero, Abby, Illinois, Effie	599	NA 1885-1888; 1898: ; 190	p1950 D + Mod S on 1/2 + p	Mod-High for historic D/S
Illinois, Abby, McKenzie, Effie	598	NA 1885-1888; 1898: ; 190	p1950 D + Mod S on 1/2 + p	Mod-High for historic D
McKenzie, Abby, Grant, Effie	597	NA 1885-1888; 1898: ; 190	p1950 D + Mod S on 1/2 + p	Mod-High for historic D
Grant, Abby, Belmont, Effie	596	NA 1885-1888; 1898: ; 190	p1950 D + Mod S on 1/2 + p	Mod-High for historic D
Belmont, Abby, 180 Fwy, Effie	590/979	NA 1885-1888; 1898: ; 190	Mod S/Hwy on 1/2 + open +	Low-Mod for historic D
Church, Holly, Belgravia, Lotus	NA	NA all maps maps	Mod D/Sch on 3/4 + open	Low for historic
Belgravia, Holly, Riggins, Lotus	NA	NA all maps maps	p1950 D on 3/4 + open	Low for historic
Riggins, Holly, Lorena, Lotus	877	NA 1885-1906; 1918: ; 194	p1950 D on 3/4 + open	Low for historic
Lorena, Holly, 99 Fwy	874	NA 1885-1906; 1918: ; 194	p1950 D/Mod Hwy on 1/2 +	Low for historic
Divisadero, Effie, Illinois, Diana	594	NA 1885-1888; 1898: ; 190	p1950 D on 3/4 + open	Mod for historic D
Illinois, Effie, McKenzie, Diana	593	NA 1885-1888; 1898: ; 190	p1950 D on 1/2 + open	Mod-High for historic D
McKenzie, Effie, Grant, Diana	592	NA 1885-1888; 1898: ; 190	p1950 D on 3/4 + open	Low for historic
Grant, Effie, Belmont, Diana	591	NA 1885-1888; 1898: ; 190	p1950/Mod D/S on 3/4 + ope	Low-Mod for historic
Belmont, Effie, White, Diana	590	NA 1885-1888; 1898: ; 190	Mod D/S on 3/4 + open + pv	Low for historic
White, Effie, 180 Fwy, Diana	979	NA 1885-1888; 1898: ; 190	Mod D on 1/2 + open	Low for historic
Church, Lotus, Belgravia, Lily	1069	NA 1885-1918; 1948:	Mod Sch on 1/2 + open	Low for historic

Belgravia, Lotus, Riggins, Lily	1068	NA 1885-1918; 1948	p1950 D	on 3/4 + open	Low for historic
Riggins, Lotus, 99 Fwy, Lily	1067	NA 1885-1918; 1948	p1950 D	on 3/4 + open	Low for historic
Divisadero, Diana, Illinois, Clark	589	NA 1885-1888; 1948; 1898:	Mod S	on 3/4 + pvd	Low-Mod for historic
Illinois, Diana, McKenzie, Clark	588	NA 1885-1888; 1948; 1898:	p1920 D/Mod S	on 1/2 + pvc	Mod for historic D
McKenzie, Diana, Grant, Clark	587	NA 1885-1888; 1948; 1898:	p1920 D	on 1/2 + pvd +open	Mod for historic D
Grant, Daina, Belmont, Clark	586	NA 1885-1888; 1948; 1898:	p1950 D	on 1/2 + open	Mod for historic D
Belmont, Daina, White, Clark	585	NA 1885-1888; 1948; 1898:	p1950 D/Mod S	on 3/4 + pvc	Mod for historic D
White, Diana, 180 Fwy, Clark	976	NA 1885-1888; 1948; 1898:	p1950 D	on 1/2 + open	Mod for historic D
Church, Lily, Belgravia, Kirk	1066	NA 1885-1906; 1918: ; 194	p1950 D	on 3/4 + open	Low for historic
Belgravia, Lily, Riggins, Kirk	1065	NA 1885-1906; 1918: ; 194	p1950 D	on 3/4 + open	Low for historic
Riggins, Lily, 99 Fwy	1064	NA 1885-1906; 1918: ; 194	p1950 D	on 1/2 + open	Low for historic
Divisadero, Clark, Illinois, Valeria	584	NA 1885-1888; 1948; 1898:	Mod Hosp	on 1/2 + pvd	Low for historic
Illinois, Clark, McKenzie, Valeria	583	NA 1885-1888; 1948; 1898:	p1920 D/Mod S/Hosp	on 1/2	Mod-High for historic D
McKenzie, Clark, Grant, Valeria	582	NA 1885-1888; 1948; 1898:	p1920 D/Mod S	on 3/4 + pvc	Low-Mod for historic
Grant, Clark, Belmont, Valeria	581	NA 1885-1888; 1948; 1898:	p1920 D	on 3/4 +open	Low for historic
Belmont, Clark, White, Valeria	585	NA 1885-1888; 1948; 1898:	p1920 D/Mod S	on 3/4 + pvc	Low for historic
White, Clark, Thomas, Valeria	975	NA 1885-1888; 1948; 1898:	Mod S/Hwy	on 1/2 + open	Low for historic
Lotus, California, Lily	546	NA 1885-1906; 1918: ; 194	p1950 D	on 3/4 + open	Low-Mod for historic D
California, 99 Fwy, Monterey, E St	231	NA 1885-1888; 1898: ; 190	p1950 D	on 3/4 + open	Low-Mod for historic D
Monterey, 99 Fwy, San Benito, E St	230	NA 1885-1888; 1898: ; 190	p1950 D	on 3/4 + open	Low for historic
99 Fwy, Lily, California, 41 Fwy	545	NA 1885-1888; 1898: ; 190	p1950 D	on 3/4 + open	Low for historic
California, E St, Los Angeles, F St	225	NA 1885-1888; 1898: ; 190	p1950 D/Ch	on 3/4 + open	Low-Mod for historic
Los Angeles, E St, Monterey, F St	226	NA 1885-1888; 1898: ; 190	p1950 D/Ch	on 3/4 + open	Low for historic
Monterey, E St, Golden St, F St	227	NA 1885-1888; 1898: ; 190	p1950 D	on 3/4 + open	Low-Mod for historic D
41 Fwy, Lorena, Rose	1061	NA 1885-1898: ; 1906: ; 19	p1920 D	on 1/4 + open	Mod for historic D
Lorena, 41 Fwy, California, F St, Rose	544	NA 1885-1888; 1898: ; 190	p1920 D	on 1/2 + open + Fw	Low for historic
Church, 41 Fwy, 99 Fwy, Nicholas	1060	NA 1885-1898: ; 1906: ; 19	p1950 D	on 1/4 + open	Mod for historic D
Nicholas, 41Fwy, Florence	1059	NA 1885-1906; 1918: -frD, -	p1950 D	on 1/2 + open + Fw	Low-Mod for historic
Florence, Rose, Lorena, Nicholas	1058	NA 1885-1898: ; 1906: ; 19	p1920 D	on 3/4 +open	Mod for historic D
Lorena, Rose, F St/41Fwy	543	NA 1885-1898: ; 1906: ; 19	p1920 D	on 3/4 +open	Low-Mod for historic
Golden St, California, G St	224/543	NA 1885-1888; 1898: ; 190	Mod Inds	on 1/2 + open	Low for historic
California, G St, 41 Fwy, RR	541/542	NA 1885-1888; 1898: ; 190	p1950/Mod Inds	+ pvd	Low-Mod for historic
Divisadero, Valeria, Illinois, Thesta	579	NA 1885-1888, 1948; 1898:	Mod hosp/pkg	on 3/4 + pvd	Low for historic
Illinois, Valeria, McKenzie, Thesta	578	NA 1885-1888, 1948; 1898:	Mod hosp	on 1/2 + pvd	Low-Mod for historic
McKenzie, Valeria, Grant, Thesta	576/577	NA 1885-1888, 1948; 1898:	p1920 D	on 3/4 + open	Low for historic
Grant, Valeria, Belmont, Thesta	575	NA 1885-1888, 1948; 1898:	p1920 D	on 3/4 + open	Low-Mod for historic
Belmont, Valeria, White, Thesta	574	NA 1885-1906, 1948; 1919:	p1950 D/Mod S	on 1/2 + ope	Low-Mod for historic
White, Clark, Thomas, Thesta	964	NA 1885-1898, 1948; 1906:	p1920 D	on 3/4 + open	Low-Mod for historic
Thomas, Clark, 180 Fwy, Thesta	963	NA 1885-1898, 1948; 1906:	Mod D	on 1/4 + open + Fwy	Low for historic
Church, Nicholas, 99 Fwy	1057	NA 1885-1906; 1918: -frD, -	p1950 D	on 1/4 + open	Mod for historic D

99 Fwy, Nicholas, Florence, Cherry	1056	NA 1885-1918; 1948: -frD, -	All open	Low for historic
Florence, Nicholas, Lorena, F St, Cherry	1055	NA 1885-1906; 1918: -frD, -	p1950 D on 3/4 + open	Low for historic
G St, California, Cherry	1054	NA 1885-1898: ; 1906: ; 19	Mod Inds on 1/4 + open + pv	Mod for historic D/S
RR, (Braly), Cherry	212/213/214	NA 1885-1906; 1918: -frD, -	p1950/Mod Inds on 1/2 + pvd	Low-Mod for historic
(Braly), RR, 41 Fwy, H St, Hamilton, Broadway, Ch	211/216	NA 1885-1898: ; 1906: ; 19	p1950 Inds on 1/2 + pvd + op	Mod for historic Inds
Hamilton, H St, Monterey, Broadway	217	NA 1885-1888; 1898: ; 190	p1950/Mod Ins on 3/4 + pvd	Low for historic
Church, Cherry, Belgravia, Anna	NA	NA all maps maps	Mod Inds on 1/2 + open	Low for historic
Belgravia, Cherry, Florence, Anna	1052	NA 1885-1906; 1918: -frD, -	p1950 D on 1/4 + open + pvd	High for historic D (V Ger)
Florence, Cherry, Lorena, Anna	1051/1051 1	NA 1885-1898; 1906: ; 191	Mod D on 1/4 + open + Hwy	Low-Mod for historic
Lorena, G St, Cherry, Railroad Ave	1050	NA 1885-1898; 1906: ; 191	p1950/Mod Inds/D + pvd	Low-Mod for historic
Railroad, Cherry, Woodward, Anna	1032/1250	NA 1885-1898; 1906: ; 191	p1950 Inds on 3/4 + pvd	Low for historic
Wodward, Cherry, Braly, Anna	1031	NA 1885-1898; 1906: ; 191	Mod Inds on 3/4 + pvd	Low for historic
Braly, Cherry, RRtr, Anna	1030	NA 1885-1898; 1906: ; 191	Mod Inds on 1/2 + pvd	Low for historic
RRtr, Broadway, Los Angeles, Fulton	209/210	NA 1885-1898; 1906: ; 191	Mod Inds/Hwy on 1/2 + pvd	Low for historic
Los Angeles, Broadway, Monterey, Fulton	208	NA 1885-1898; 1906: ; 191	Mod Inds on 3/4 + pvd	Low for historic
Monterey, Broadway, San Benito, Fulton	207	NA 1885-1888; 1898: ; 190	Mod Hwy + pvd + open	Low for historic
Church, Anna, Belgravia, Taylor	NA	NA all maps maps	p1950 D/Mod Inds on 1/2 + p	Low for historic
Belgravia, Anna, Golden State, Taylor	1048	NA 1885-1906; 1918: -frD, -	p1950 D/Inds on 1/2 + open -	Mod for historic D
Florence, G St, Anna, Lorena, Railroad	1047	NA 1885-1898; 1906: ; 191	Mod Inds on 1/2 + pvd + ope	Mod for historic Inds
Railroad, Anna, California, Van Ness	1251	NA 1885-1906; 1918: -frD, -	p1950/Mod Inds on 1/2 + pvd	Low for historic
California, Anna, Woodward, Van Ness	1029	NA 1885-1898; 1906: ; 191	Mod Inds on all	Low for historic
Woodward, Anna, Braly, Van Ness	1028	NA 1885-1898; 1906: ; 191	p1950/Mod Inds on 1/2 + pvd	Low for historic
Braly, Anna, Hamilton, Van Ness	1027	NA 1885-1898; 1906: ; 191	p1950/Mod Inds on 1/2 + pvd	Low for historic
Hamilton, San Diego, Van Ness	201	NA 1885-1898; 1906: ; 191	All pvd	Low-Mod for historic
San Diego, Fulton, Los Angeles, Van Ness	202	NA 1885-1898; 1906: ; 191	p1950/Mod Inds on 3/4 + pvd	Low-Mod for historic
Los Angeles, Fulton, Monterey, Van Ness	203/203 1/2	NA 1885-1888; 1898: ; 190	p1950/Mod Inds on 1/2 + pvd	Mod for historic D/Inds
Monterey, Fulton, 41 Fwy, Van Ness	204	NA 1885-1888; 1898: ; 190	p1950 Inds on 1/2 + pvd + op	Mod for historic D/Inds
Church, Taylor, Belgravia, Sarah	NA	NA all maps maps	p1950/Mod D/Inds on 1/2 pv	Low for historic
Belgravia, Taylor, 99 Fwy	1045 1/2	NA 1885-1906; 1918: -frD, -	All open	Low -Mod for historic
99 Fwy, Van Ness, Florence, Sarah	1045	NA 1885-1906; 1918: -frD, -	p1950 S on 1/2 + pvd	Low for historic
Railroad, Van Ness Lorena, Sarah	1255	NA 1885-1906; 1918: -frD, -	Mod Inds on 3/4 + pvd	Low for historic
Lorenca, Van Ness, California, Sarah	1252	NA 1885-1906; 1918: -frD, -	p1950/Mod Inds on 1/2 + pvd	Mod for historic Inds
California, Van Ness, Woodward, Sarah	1026	NA 1885-1898; 1906: ; 191	p1950/Mod Inds on 3/4 + pvd	Low-Mod for historic
Woodward, Van Ness, Braly, Sarah	1025	NA 1885-1898; 1906: ; 191	Mod Inds on 3/4 + pvd	Low-Mod for historic
Braly, Van Ness, Hamilton, Sarah	1024	NA 1885-1898; 1906: ; 191	p1950/Mod Inds/S + open + p	Mod-High for historic D/S
Hamilton, Van Ness, San Diego, L St	197	NA 1885-1898; 1906: ; 191	Mod Inds on 3/4 + pvd	Low for historic
San Diego, Van Ness, Los Angeles, L St	196	NA 1885-1898; 1906: ; 191	p1950/Mod Inds on 1/2 + pvd	Low-Mod for historic
Los Angeles, Van Ness, Monterey, L St	195	NA 1885-1888; 1898: ; 190	Mod Inds on 1/2 + pvd	Mod for historic D
Monterey, Van Ness, San Benito/41 Fwy, L St	194	NA 1885-1888; 1898: ; 190	p1950 D/Mod Inds on 1/2 + o	Mod for historic D
Church, Sarah, 99 Fwy	1044	NA 1885-1906; 1918: -frD, -	Mod Inds/S on 1/2 + pvd	Low for historic

Belgravia, G St/99 Fwy, Sarah, Railroad	1043	NA 1885-1906; 1918: -frD, -	p1950 Inds/S on 1/4 + pvd +	Low-Mod for historic	
Florence, Sarah, Lorena, (Mary)	NA	NA all maps maps	p1950/Mod Inds on 1/2 + pvd	Low for historic	
Lorena, Sarah, California, (Mary)	NA	NA all maps maps	Mod Inds on 1/4 + open + pv	Low for historic	
California, Sarah, Woodward, Mary	1023	NA 1885-1898; 1906: ; 191	p1950/Mod Inds on 3/4 + pvd	Low-Mod for historic	
Woodward, Sarah, Braly, Mary	1022	NA 1885-1898; 1906: ; 191	p1950 D/Mod Inds on 1/2 + p	Low-Mod for historic	
Braly, Sarah, Hamilton, Mary	1021	NA 1885-1898; 1906: ; 191	p1950 D/Inds + Mod Inds on	Low for historic	
Hamilton, L St, San Diego, Heaton, (Mary)	188	NA 1885-1898; 1906: ; 191	Mod Inds on 1/2 + pvd	Low for historic	
San Diego, L St, Los Angeles, M St	189	NA 1885-1898; 1906: ; 191	p1950 Inds on all	Low for historic	
Los Angeles, L St, Monterey, M St	190	NA 1885-1888; 1898: ; 190	Mod Inds on 1/2 + pvd	Low-Mod for historic	
Monterey, L St, San Benito, M St	191	NA 1885-1888; 1898: ; 190	p1950 D/Inds + Mod Inds on	Low-Mod for historic	
Church, G St/99 Fwy, Belgravia, Railroad	1040	NA 1885-1906; 1918: -frD, -	p1950 Inds/S + Mod Inds on	Low for historic	
Belgravia, Railroad, Florence, Orinda	1039/1041	NA 1885-1906; 1918: -frD, -	p1950 Inds/D on 1/4 open +	Mod for historic D	
Florence, (Mary), (Lorena), (Orinda)	NA	NA all maps maps	Mod Inds on 1/2 + pvd	Low for historic	
(Lorena), (Mary), California, (Pearl)	NA	NA all maps maps	Mod Inds on 1/2 + pvd	Low for historic	
California, Mary, Woodward, Pearl	1020	NA 1885-1898; 1906: ; 191	Mod Inds on all	Low for historic	
Woodward, Mary, Braly, (Pearl)	1019	NA 1885-1898; 1906: ; 191	Mod Inds on 1/2 + pvd	Low-Mod for historic	
Braly, Mary, Hamilton, (Pearl)	1018	NA 1885-1898; 1906: ; 191	Mod Inds on 3/4 + pvd	Low-Mod for historic	
Hamilton, (Mary), Heaton, Pearl	1017 (?)	NA 1885-1898; 1906: ; 191	Mod Inds on 1/2 + pvd	Low for historic	
Heaton/M St, Los Angeles, Butler, Pearl	187/1016	NA 1885-1898; 1906: ; 191	p1950/Mod Inds on 1/2 + pvd	Low-Mod for historic	
Los Angeles, M St, Monterey, N St	186	NA 1885-1898; 1906: ; 191	Mod Inds on 3/4 + pvd	Low for historic	
Monterey, M St, San Benito/41 Fwy, N St	185	NA 1885-1888; 1898: ; 190	p1950 D/Mod Inds on 3/4 + o	Low-Mod for historic	
41 Fwy, alley, Santa Clara, N St	184	NA 1885-1888; 1898: ; 190	p1950 D on 3/4 + open	Low-Mod for historic	
Santa Clara, alley, Ventura, N St	121	NA 1885-1888; 1898: ; 190	p1950/Mod S on 1/2 + pvd	Low-Mod for historic	
Kern, alley, Tulare, N St	117	NA 1885; 1888: ; 1898: ; 19	p1950 S/Apt + Mod S on 3/4	Mod for historic D	
Fresno, alley, Merced, N St	114	1885: ; 1888: ; 1898: ; 1906	Mod S on 1/2 + pvd	Mod for historic D	
Merced, alley, Tuolumne, N St	113	NA 1885; 1888: ; 1898: ; 19	p1950 D/Mod S on 3/4 + pvd	Mod-High for historic Ch/D	
Tuolumne, alley, Stanislaus, N St	112	NA 1885; 1888: ; 1898: ; 19	Mod S on 1/2 + pvd	Mod for historic D	
Stanislaus, alley, Calaveras, N St	111E	NA 1885; 1888: ; 1898: ; 19	p1950 Ch/Apt/S on 3/4 + ope	Low-Mod for historic	L St HD
Calaveras, alley, Divisadero, N St	340E	NA 1885; 1888: ; 1898: ; 19	p1920 D/Ch on 1/2 + open +	Low for historic	L St HD
Church, Railroad, Orinda, Belgravia, Grace	465	NA 1885-1898; 1906: ; 191	p1920 D on 1/4 + open	Mod for historic D	
Belgravia, Orinda, Florence, Grace	1037	NA 1885-1906; 1918: -frD, -	p1920 D on 1/2 + open	Mod for historic D	
Florence, (Orinda), (Lorena), (Grace)	1258	NA 1885-1918; 1948: -frD, -	p1950/Mod Inds on 1/2 + pvd	Low for historic	
(Lorena), (Orinda), California, (Grace)	1035	NA 1885-1906; 1918: -frD, -	p1950/Mod Inds on 1/2 + pvd	Low for historic	
California, Pearl, (Woodward), (Grace)	1030	NA 1885-1918; 1948: -frD, -	All open + pvd	Low-Mod for historic	
(Woodward), (Pearl), (Braly), (Grace)	1216	NA 1885-1918; 1948: -frD, -	Mod Inds on 1/4 + pvd + ope	Low-Mod for historic	
(Braly), (Pearl), Hamilton, (Grace)	1202	NA 1885-1906; 1918: -frD, -	Mod Inds on all	Low for historic	
Hamilton, Pearl, (Heaton), (Grace)	1014	NA 1885-1918; 1948: -frD, -	Mod Inds on 1/4 + pvd + ope	Low-Mod for historic	
(Heaton), Pearl, Butler, (Grace)	1014	NA 1885-1906; 1918: -frD, -	p1950 Inds on 1/4 + open	Mod-High for historic Inds	
Butler, N St, Monterey, O St	181/1015	NA 1885-1898; 1906: ; 191	p1950 Inds on 1/2 + pvd	Low-Mod for historic	
Monterey, N St, San Benito, O St	182	NA 1885-1888; 1898: ; 190	p1950 D/Mod S/Inds on 1/2 +	Mod for historic D	

41 Fwy, N St, Santa Clara, O St	183	NA 1885-1898; 1906: ; 191	All pvd + open	Mod for historic D	
Santa Clara, N St, Ventura, O St	122	NA 1885-1888; 1898: ; 190	Mod Inst on 1/2 + pvd + oper	Low-Mod for historic	
Capitol, N St, Kern, O St	125	NA 1885; 1888: ; 1898: ; 19	p1950 Inst/S on 1/2 + pvd	Mod for historic S/D	
Kern, N St, Tulare, O St	126	NA 1885; 1888: ; 1898: ; 19	Mod Inst on 3/4 + pvd	Low for historic	
Tulare, N St, Mariposa, O St	127	NA 1885; 1888: ; 1898: ; 19	Mod Inst on 1/2 + pvd + oper	Mod-High for historic D/S	
Mariposa, N St, Fresno, O St	418	NA 1885; 1888: ; 1898: ; 19	p1950/Mod Inst on 1/4 + pvd	Mod-High for historic Inst/S	
Fresno, N St, Merced, O St	417	NA 1885; 1888: ; 1898: ; 19	p1950 Inst on 1/2 + pvd + op	Low for historic	
Merced, N St, Tuolumne, O St	128	NA 1885; 1888: ; 1898: ; 19	p1950 D/Mod S on 1/2 + pvd	Mod-High for historic Ch/D	
Tuolumne, N St, Stanislaus, O St	129	NA 1885; 1888: ; 1898: ; 19	p1950 Inst/S + Mod S on 1/4	Mod-High for historic S/D	
Stanislaus, N St, Calaveras, O St	130	NA 1885-1888 ; 1898: ; 190	Mod S/D on 1/4 + pvd + oper	Mod-High for historic S/D	
Calaveras, N St, Divisadero	616A	NA 1885-1888 ; 1898: ; 190	All open	Mod for historic D	
Church, Grace, Belgravia, East	464	NA 1885-1906; 1918: -frD, -	p1950 D/Mod Inds on 1/2 + o	Low-Mod for historic	
Belgravia, Grace, Florence, East	1034	NA 1885-1906; 1918: -frD, -	p1950 D on 1/4 + open + pvd	Mod for historic D	
Florence, (Grace), (Lorena), East	1258	NA 1885-1918; 1948: -frD, -	Mod Inds on 1/2 + pvd	Low for historic	
(Lorena), (Grace), California, East	1035	NA 1885-1906; 1918: -frD, -	p1950 Inds on 1/2 + pvd	Low for historic	
California, (Grace), (Woodward), East	1231	NA 1885-1918; 1948: -frD, -	All pvd + open	Low-Mod for historic	
(Woodward), (Grace), (Braly), East	1217	NA 1885-1918; 1948: -frD, -	Mod Inds on 1/2 + pvd	Low-Mod for historic	
(Braly), (Grace), Hamilton, East	1203	NA 1885-1918; 1948: -frD, -	Mod Inds on 1/2 + pvd	Low-Mod for historic	
Hamilton, (Grace), Butler, East	1164	NA 1885-1898; 1906: ; 191	p1950 Inds on 1/4 + open + p	Low for historic	
Butler, O St, (Los Angeles), P St	1013	NA 1885-1906; 1918: -frD, -	p1950/Mod Inds on 1/2 + pvd	Low-Mod for historic	
(Los Angeles), O St, (Monterey), P St	1012	NA 1885-1906; 1918: -frD, -	All pvd + open	Low-Mod for historic	
(Monterey), O St, San Benito/41 Fwy, P St	180	NA 1885-1906; 1918: -frD, -	p1950 Inds on 3/4 + pvd + op	Low for historic	
41 Fwy, O St, Ventura, P St	139	NA 1885-1888; 1898: ; 190	Mod S/Hwy on 1/2 + pvd	Low-Mod for historic	
Ventura, O St, (Mono), P St	138	NA 1885-1888; 1898: ; 190	Mod Inst on 1/4 + pvd	Mod for historic D	
(Mono), O St, Inyo, P St	137	NA 1885-1888; 1898: ; 190	Mod Inst on 1/4 + pvd	Mod for historic D	
Inyo, O St, Kern, P St	136	NA 1885; 1888: ; 1898: ; 19	Mod Inst on 1/2 + pvd	Low-Mod for historic	
Kern, O St, Tulare, P St	135	NA 1885; 1888: ; 1898: ; 19	Mod Inst on 3/4 + pvd	Low-Mod for historic	
Tulare, O St, Mariposa, P St	134	NA 1885; 1888: ; 1898: ; 19	Mod Inst on 3/4 + pvd	Low for historic	
Mariposa, O St, Fresno, P St	416	NA 1885; 1888: ; 1898: ; 19	Mod Inst on 1/4 + pvd	Mod for historic D/S	
Fresno, O St, Merced, P St	415	NA 1885; 1888: ; 1898: ; 19	p1950 Apt/S + Mod S on 1/2	Mod for historic D	
Merced, O St, Tuolumne, P St	133	NA 1885; 1888: ; 1898: ; 19	Mod S on 1/4 + pvd + open	Mod for historic D/Ch	
Tuolumne, O St, Stanislaus, P St	132	NA 1885-1888; 1898: ; 190	Mod Sch on 1/2 + pvd	Mod for historic Sch	
Stanislaus, O St, Divisadero	131	NA 1885-1888; 1898: ; 190	Mod S on 1/4 + pvd + open	Low-Mod for historic	
Butler, (P St), (Los Angeles), RRtr/Q St	1150	NA 1885-1898; 1906: ; 191	Mod Inds on 1/2 + pvd	Low-Mod for historic	
(Los Angeles), (P St), Monterey, RRtr/Q St	1011/1038	NA 1885-1898; 1906: ; 191	p1950/Mod Inds on 3/4 + pvd	Low for historic	
(Monterey), (P St), (San Benoto), RRtr/Q St	1008/1010	NA 1885-1898; 1906: ; 191	p1920 Inds on 1/4 + Mod Ind	Mod for historic Inds	
(San Benito), P St, 41 Fwy, RRtr/Q St	178/1007	NA 1885-1888; 1898: ; 190	p1950 Inds on 1/4 + pvd + op	Low-Mod for historic	
41 Fwy, P St, Ventura, RRtr/Q St	140	NA 1885-1888; 1898: ; 190	Mod Inds on 1/2 + pvd	Mod for historic Inds	SFW HD
Ventura, P St, Mono, RRtr/Q St	141	NA 1885-1888; 1898: ; 190	p1920 Inds on 1/2 + pvd	Mod-High for historic Inds	SFW HD
Mono, P St, Inyo, RRtr/Q St	142	NA 1885-1888; 1898: ; 190	p1920 Inds on 1/4 + pvd + op	Mod-High for historic Inds	SFW HD

Inyo, P St, Kern, RRtr/Q St	143	NA 1885-1888; 1898: ; 190	Mod Inds on 1/2 + pvd	Mod for historic Inds	
Kern, P St, Tulare, RRtr/Q St	144	NA 1885-1888; 1898: ; 190	p1920 S/Hotel/RR str + pvd	Mod for historic S	SFW HD
Tulare, P St, Mariposa, Q St	145	NA 1885; 1888: ; 1898: ; 19	Mod Inst on 1/2 + pvd	Mod for historic S	
Mariposa, P St, Fresno, Q St	146	NA 1885; 1888: ; 1898: ; 19	Mod Inst on 1/2 + pvd	Low-Mod for historic	
Fresno, P St, Merced, Q St	147	NA 1885; 1888: ; 1898: ; 19	p1950 D/S on 1/4 + Mod S or	Mod for historic D	
Merced, P St, Tuolumne, Q St	148	NA 1885; 1888: ; 1898: ; 19	p1950 D on 1/2 + Mod S on 1	Mod for historic D	
Tuolumne, P St, Divisidero	149	NA 1885; 1888: ; 1898: ; 19	p1920 D/Mod S on 1/2 + pvd	Low-Mod for historic	
ARTS AND CULTURE DISTRICT					
Tuolumne, H St, Stanislaus, Broadway	65	NA 1885; 1888: ; 1898: ; 19	p1950 S on 1/2 + open + pvd	Mod for historic S/D	
Stanislaus, H St, Calaveras, Broadway	66	NA 1885; 1888: ; 1898: ; 19	p1950 S on 3/4 + Pvd	Mod for historic D	
Calaveras, H St, San Joaquin, Broadway	335	NA 1885; 1888: ; 1898: ; 19	p1950/Mod S on 3/4 + pvd	Low-Mod for historic D/S	
San Joaquin, H St, Amador, Broadway	345	NA 1885; 1888: ; 1898: ; 19	p1950 S on 3/4 + pvd	Low for historic	
Amador, H St, Sacramento, Broadway	367	NA 1885-1888 ; 1898: ; 190	Mod S on 3/4 + pvd + open	Mod for historic S/D	
Sacramento, H St, El Dorado, Broadway	372	NA 1885-1888 ; 1898: ; 190	p1950/Mod S on 3/4 + pvd	Low-Mod for historic D	
El Dorado, H St, Divisadero, Broadway	390	NA 1885-1888 ; 1898: ; 190	Mod S on 1/2 + pvd	Mod for historic S/D	
Tuolumne, Broadway, Stanislaus, Fulton	68	NA 1885; 1888: ; 1898: ; 19	p1950 S/Ch on 3/4 + pvd	Mod for historic S/D	
Stanislaus, Broadway, Calaveras, Fulton	67	NA 1885; 1888: ; 1898: ; 19	Mod S on 1/2 + pvd	Mod for historic S/D	
Calaveras, Broadway, San Joaquin, Fulton	336	NA 1885; 1888: ; 1898: ; 19	Mod S on 1/2 + pvd	Mod for historic S/D	
San Joaquin, Broadway, Amador, Fulton	344	NA 1885; 1888: ; 1898: ; 19	p1950/Mod S on 1/2 + pvd	Low-Mod for historic	
Amador, Broadway, Sacramento, Fulton	368	NA 1885-1888 ; 1898: ; 190	Mod S on 3/4 + pvd + open	Mod for historic D	
Sacramento, Broadway, El Dorado, Divisadero, Fu	371	NA 1885-1888 ; 1898: ; 190	Mod S on 3/4 + pvd	Low-Mod for historic	
Tuolumne, Fulton, Stanislaus, Van Ness	87	NA 1885; 1888: ; 1898: ; 19	p1950/Mod S/Ch on 3/4 + pv	Mod for historic D/S	
Stanislaus, Fulton, Calaveras, Van Ness	86	NA 1885; 1888: ; 1898: ; 19	p1950/Mod S on 1/2 + pvd +	Mod for historic D/S	
Calaveras, Fulton, San Joaquin, Van Ness	337	NA 1885; 1888: ; 1898: ; 19	Mod S on 1/4 + pvd	Mod for historic D	
San Joaquin, Fulton, Amador, Van Ness	343	NA 1885; 1888: ; 1898: ; 19	p1950/Mod S on 1/2 + pvd +	Mod for historic D/S	
Amador, Fulton, Divisadero, Van Ness	369/411	NA 1885-1888 ; 1898: ; 190	Mod S/p1950 D on 3/4 + pvd	Low-Mod for historic	
Tuolumne, Van Ness, Stanislaus, L St	90	NA 1885; 1888: ; 1898: ; 19	p1950/Mod S on 3/4 + pvd	Mod for historic D/S	
Stanislaus, Van Ness, Calaveras, L St	89	NA 1885; 1888: ; 1898: ; 19	p1950 D/S + Mod S on 1/2 +	Mod-High for historic D/S	
Calaveras, Van Ness, San Joaquin, L St	338	NA 1885-1888 ; 1898: ; 190	p1950 D + Mod S/Inst on 3/4	Mod for historic D	L St HD
San Joaquin, Van Ness, Amador, L St	342	NA 1885-1888 ; 1898: ; 190	p1950 S/Apt/D on 1/2 + pvd +	Mod for historic D/S	L St HD
Amador, Van Ness, Divisidero, L St	370	NA 1885-1888 ; 1898: ; 190	Mod S on 1/2 + pvd + open	Mod for historic D	
Tuolumne, L St, Stanislaus, M St	109	NA 1885; 1888: ; 1898: ; 19	Mod S on 1/2 + pvd + open	Mod for historic D/Apt	
Stanislaus, L St, Calaveras, M St	110	NA 1885; 1888: ; 1898: ; 19	p1950 Apt on 1/4 + pvd	Mod for historic D/Apt/S	
Calaveras, L St, San Joaquin, M St	339	NA 1885; 1888: ; 1898: ; 19	Mod S/Inst on 3/4 + pvd	Low-Mod for historic	L St HD
San Joaquin, L St, Divisadero, M St	341	NA 1885-1888 ; 1898: ; 190	p1950 D/Mod S on 1/2 + pvd	Mod for historic D	L St HD
Tuolumne, M St, Stanislaus, alley	112W	NA 1885; 1888: ; 1898: ; 19	p1950 S/Mod Inst on 3/4 + p	Low-Mod for historic	
Stanislaus, M St, Calaveras, alley	111W	NA 1885; 1888: ; 1898: ; 19	p1950 S/Mod Ch on 3/4 + pv	Low-Mod for historic	L St HD
Calaveras, M St, Divisadero, alley	340W	NA 1885-1888 ; 1898: ; 190	p1920 D/p1950 Inst on 1/2 +	Low-Mod for historic	L St HD
H St, Roosevelt, 180 Fwy, Echo	672/673	NA 1885-1898; 1906: ; 191	p1920 D/p1950 Inds/Mod Ind	Low-Mod for historic	NP HD
Divisadero, Echo, Voorman, Broadway	641/673 1/2	NA 1885-1898; 1906: ; 191	p1950 S/Mod S on 1/4 + pvd	Mod for historic D/S	NP HD

Voorman, Echo, Nevada, Broadway	640	NA 1885-1898; 1906: ; 191	p1920 D/Ch + Mod S on 3/4 ·	Mod for historic D	NP HD
Nevada, 180 Fwy, Broadway	668	NA 1885-1898; 1906: ; 191	p1920 D on 1/2 + open	Low-Mod for historic	NP HD
Divisadero, Broadway, Voorman, Yosemite	719	NA 1885-1888; 1898:; 1906	p1950 Apt/S on 1/2 + open +	Mod for historic D/S	NP HD
Voorman, Broadway, Nevada, Yosemite	639	NA 1885-1888; 1898:; 1906	p1920 D/p1950 S/Mod S on 3	Mod for historic D/S	NP HD
Nevada, Broadway, 180 Fwy, Yosemite	664	NA 1885-1888; 1898:; 1906	p1910 D on 3/4 + open	Low-Mod for historic	NP HD
Divisadero, Yosemite, Voorman, Fulton	642	NA 1885-1888; 1898:; 1906	p1950 D/Mod S on 3/4 + pvd	Low-Mod for historic	NP HD
Voormans, Yosemite, Nevada, Fulton	638	NA 1885-1888; 1898:; 1906	p1920 D on 1/2 Mod S on 1/4	Mod for historic D	NP HD
Nevada, Yosemite, Mildreda/180 Fwy, Fulton	659/660	NA 1885-1888; 1898:; 1906	p1920 D on 3/4 Mod S on 1/4	Low-Mod for historic	NP HD
Divisadero, Fulton, Voorman, Van Ness	643	NA 1885-1888; 1898:; 1906	p1950 D on 1/2 Mod S on 1/4	Low-Mod for historic	NP HD
Voorman, Fulton, Nevada, Van Ness	637	NA 1885-1888; 1898:; 1906	p1920 D on 3/4 + open	Mod for historic D/Apt	NP HD
Nevada, Fulton, Mildreda, Van Ness	655	NA 1885-1898; 1906: ; 191	p1920 D on 3/4 + open	Low for historic	NP HD
Mildreda, Fulton, 180 Fwy, Van Ness	654	NA 1885-1898; 1906: ; 191	p1920 D on 3/4 + open + pvd	Low for historic	NP HD
Divisadero, Van Ness, Voorman, College	697	NA 1885-1888; 1898:; 1906	Mod S on 1/4 + pvd	Low-Mod for historic	NP HD
Voorman, Van Ness, Nevada, College	634	NA 1885-1888; 1898:; 1906	p1920 D on 3/4 + open	Low for historic	NP HD
Nevada, Van Ness, Mildreda, College	632	NA 1885-1888; 1898:; 1906	p1920 D on 3/4 + open	Low for historic	NP HD
Mildreda, Van Ness, Franklin/180 Fwy, College	631	NA 1885-1888; 1898:; 1906	p1920 D on 3/4 + Mod D on	Low for historic	NP HD
California, East, (Woodward), (Parallel)	1232	NA 1885-1918; 1948:	All open	Mod-High for historic Inds	
(Woodward), East, (Braly), (Parallel)	NA	NA all maps maps	Mod Inds on 1/4 + open	Low for historic	
(Braly), East, Hamilton, Parallel	1204	NA 1885-1918; 1948:	Mod Inds on 1/2 + pvd	Low for historic	
Hamilton, East, (Townsend), Parallel	1175/1187	NA 1885-1906; 1918: ; 194	Mod Inds on 3/4 + pvd	Low for historic	
(Townsend), East, Butler, Parallel	1165	NA 1885-1906; 1918: ; 194	Mod Inds on 3/4 + pvd	Low for historic	
Butler, RRtr/Q St, Topeka, Parallel	1157	NA 1885-1918; 1948:	p1950 Inds on 1/2 + pvd	Low for historic	
Topeka, RRtr/Q St, (Monterey), Parallel	892	NA 1885-1918; 1948:	p1950/Mod Inds on 1/4 + pvd	Low-Mod for historic	
(Monterey), RRtr/Q St, San Benito, Parallel	891	NA 1885-1918; 1948:	p1950/Mod Inds on 1/4 + pvd	Low-Mod for historic	
San Benito, RRtr/Q St, 41 Fwy	797	NA 1885-1906; 1918: ; 194	p1950/Mod Inds on 3/4 + pvd	Low for historic	
41 Fwy, RRtr/Q St, Ventura,	158/1006	NA 1885-1898; 1906: : 191	All pvd	Mod for historic RR/Inds	
Ventura, RRtr, Mono, R St	157	NA 1885-1888; 1898: ; 190	p1950 Inds on 1/2 + pvd	Mod for historic RRtr/str	SFW HD
Mono, RRtr, Inyo, R St	156	NA 1885-1888; 1898: ; 190	p1950 Inds on 1/2 + pvd	Low-Mod for historic RRtr	SFW HD
Inyo, RRtr, Kern, R St	155	NA 1885-1888; 1898: ; 190	p1950 Inds on 1/2 + pvd	Low-Mod for historic RRtr	SFW HD
Kern, RRtr, Tulare, R St	154	NA 1885-1888; 1898: ; 190	p1950/Mod Inds on 1/4 + pvd	Low-Mod for historic D/RRtr	SFW HD
Tulare, Q St, Mariposa, R St	153	NA 1885; 1888: ; 1898: ; 19	p1900 D/Mod S on 1/4 + pvd	Mod-High for historic S/D/Inst	SJC HD
Mariposa, Q St, Fresno, R St	152	NA 1885; 1888: ; 1898: ; 19	p1910 D/Mod S on 1/4 + pvd	Mod for historic D	SJ HD
Fresno, Q St, Merced, R St	151	NA 1885-1888; 1898: ; 190	Mod Inst on 1/2 + pvd + oen	Low-Mod for historic	
Merced, Q St, Tuolumne, Divisadero, R St	150	NA 1885-1888; 1898: ; 190	Mod Inst on 3/4 + pvd + oen	Low-Mod for historic	
Parallel, El Monte, Hazelwood, 1st St	2000	NA 1885-1906; 1918: ; 194	Mod reservoir on 3/4 + open	Low for historic	
El Monte, Parallel, Ventura, Hazelwood	798	NA 1885-1906; 1918: ; 194	p1950 D/Mod Inst on 1/2 + o	Mod for historic D	
41 Fwy, R St, Huntington, (S St)	160/161	NA 1885-1888; 1898: ; 190	Mod D on 3/4 + open	Low for historic	
Huntington, R St, Tulare, (S St)	152/161	NA 1885-1888; 1898: ; 190	Mod D/S on 3/4 + open	Low for historic	
Tulare, R St, Mariposa, S St	163	NA 1885; 1888: ; 1898: ; 19	p1910 Ch/Mod S on 1/2 + pv	Mod for historic D/Apt/S	SJC HD
Mariposa, R St, Fresno, S St	164	NA 1885; 1888: ; 1898: ; 19	p1920 D/Inst/p1950 Sch/Mod	Low-Mod for historic D	SJC HD

Fresno, R St, Divisadero,	165/166/414	NA 1885-1888; 1898: ; 190	Mod Hosp on 3/4 + pvd + ope	Low for historic	
(S St), Huntington, 41 Fwy	170/171	NA 1885-1888; 1898: ; 190	Mod D on 3/4 + open	Low for historic	
Huntington, (S St), Tulare, T St	169/170	NA 1885-1888; 1898: ; 190	Mod D/Inst on 3/4 + pvd + op	Low for historic	
Tulare, S St, Mariposa, T St	168	NA 1885; 1888: ; 1898: ; 19	p1920 D/Mod S/Apt on 1/2 +	Mod for historic D/Apt	SJC HD
Mariposa, S St, Fresno, T St	167	NA 1885; 1888: ; 1898: ; 19	p1910 D/Mod S on 1/2 + pvd	Mod for historic D	SJC HD
Divisadero, Thesta, Illinois, Howard	573	NA 1885-1888, 1948; 1898:	Mod Hosp on all	Low for historic	
Illinois, Thesta, McKenzie, Howard	572	NA 1885-1888, 1948; 1898:	Mod Hosp on 1/2 + pvd	Low for historic	
McKenzie, Thesta, Grant, (Howard)	570/571	NA 1885-1888, 1948; 1898:	Mod Sch/D on 1/2 + open + p	Low for historic	
Grant, Thesta, Belmont, Howard	569	NA 1885-1888, 1948; 1898:	p1930 D on 3/4 + open	Low for historic	BB HD
Belmont, Thesta, White, Fresno	568	NA 1885-1888, 1948; 1898:	p1919 D on 1/2 +Mod S on 1	Low-Mod for historic	
White, Thesta, Thomas, Fresno	955	NA 1885-1898, 1948; 1906:	p1919 D on 1/2 +Mod D on 1	Low for historic	
Thomas, Thesta, 180 Fwy, Fresno	954	NA 1885-1898, 1948; 1906:	p1919 D on 1/2 + Mod S on 1	Low for historic	
Divisadero, Howard, Illinois, Fresno	567	NA 1885-1888, 1948; 1898:	Mod Hosp on 3/4 + pvd	Low for historic	
Illinois, Howard, McKenzie, Fresno	566	NA 1885-1888, 1948; 1898:	Mod Hosp on 1/4 + pvd	Mod for historic D	
McKenzie, Howard, Grant, Fresno	570/950	NA 1885-1888, 1948; 1898:	p1919 D on 1/4 + Mod D on 1	Mod for historic D	
Grant, Howard, Belmont, Fresno	569	NA 1885-1888, 1948; 1898:	p1919 D on 1/2 + Mod D on 1	Low-Mod for historic	BB HD
(T St), Tulare, U St/41 Fwy	173	NA 1885-1898; 1906: ; 191	Mod D/S on 1/2 + open + pvc	Low for historic	
Tulare, T St, Mariposa, U St	174	NA 1885-1898; 1906: ; 191	p1920 D on 1/4 + /Mod S 1/4	Low-Mod for historic D	SJC HD
Mariposa, T St, Fresno, Divisadero, U St	175	NA 1885-1898; 1906: ; 191	p1950 D/Ch on 1/2 + pvd	Low-Mod for historic D	SJC HD
Divisadero, Fresno, Illinois, U St	565	NA 1885-1898, 1948; 1906:	p1919 D on 1/4 + Mod D on 1	Low-Mod for historic	
Illinois, Fresno, McKenzie, U St	561	NA 1885-1898, 1948; 1906:	p1919 D on 1/2 + Mod D on 1	Mod for historic D	
McKenzie, Fresno, Washington, Mariposa	948/949	NA 1885-1898, 1948; 1906:	p1919 D on 1/2 + Mod D on 1	Low for historic	
Washington, Fresno, Grant, Mariposa	947	NA 1885-1898, 1948; 1906:	p1919 D on 3/4 + open	Low for historic	
Grant, Fresno, Madison, Mariposa	946	NA 1885-1898, 1948; 1906:	p1919 D on 3/4 + open	Low for historic	EM HD
Madison, Fresno, Belmont, Mariposa	945	NA 1885-1898, 1948; 1906:	p1930 D on 3/4 + open	Low for historic	EM HD
Belmont, Fresno, White, Agusta	944	NA 1885-1898, 1948; 1906:	p1919 D on 1/4 + Mod Ch on	Low-Mod for historic	
White, Fresno, Thomas, Agusta	943	NA 1885-1898, 1948; 1906:	p1919 D on 1/2 + Mod D on 1	Low for historic	
Thomas, Fresno, 180 Fwy, Agusta	942	NA 1885-1898, 1948; 1906:	Mod D on 3/4 + open	Mod for historic D	
U St, Tulare, 41 Fwy	177	NA 1885-1898; 1906: ; 191	Mod S on 1/2 + pvd	Low-Mod for historic	
Tulare, U St, Divisadero, 41 Fwy	176	NA 1885-1898; 1906: ; 191	Mod S on 1/2 + pvd	Low-Mod for historic	
Divisadero, U St, Illinois, Mariposa	564	NA 1885-1888, 1948; 1898:	p1950 D on 1/2 + Mod S on 1	Low for historic	
Illinois, U St, McKenzie, Mariposa	560	NA 1885-1888, 1948; 1898:	p1919 D on 3/4 + open	Low for historic	
Belmont, Augusta, (White), (Mariposa)	918	NA 1885-1898, 1948; 1906:	Mod Sch on 1/2 + open	Low for historic	
(White), Augusta, (Thomas), (Mariposa)	940	NA 1885-1898; 1906: ; 191	Mod Sch on all	Low for historic	
(Thomas), Augusta, 180 Fwy, (Mariposa)	939	NA 1885-1898; 1906: ; 191	Mod Sch on 1/2 + pvd	Low for historic	
Divisadero, Mariposa, Illinois, Diamond	563	NA 1885-1888; 1898: ; 190	Mod Sch on 3/4 + pvd	Low for historic	
Illinois, Mariposa, Nevada, (Diamond)	559	NA 1885-1888; 1898: ; 190	Mod Sch on all	Low for historic	
Nevada, Mariposa, McKenzie, (Diamond)	559	NA 1885-1898; 1906: ; 191	p1950 D on 3/4 + open	Low for historic	
McKenzie, Mariposa, Washington, Angus	937	NA 1885-1898; 1906: ; 191	p1919 D on 3/4 + open	Low for historic	
Washington, Mariposa, Grant, Angus	936	NA 1885-1898; 1906: ; 191	p1919 D on 3/4 + open	Low for historic	

Grant, Mariposa, Madison, Angus	935	NA 1885-1898, 1948; 1906:	p1930 D on 3/4 + open	Low for historic	EM HD
Madison, Mariposa, Belmont, Angus	934	NA 1885-1898; 1906: ; 191	p1930 D on 3/4 + open	Low for historic	EM HD
Belmont, Mariposa, (White), 41 Fwy	933	NA 1885-1898; 1906: ; 191	Mod Sch on 1/2 + open + pvc	Low-Mod for historic	
(White), Mariposa, (Thomas), 41 Fwy	932	NA 1885-1898; 1906: ; 191	Mod Sch on 1/2 + open	Low-Mod for historic	
Thomas, Mariposa, 180 Fwy	931	NA 1885-1898; 1906: ; 191	Mod Sch on 1/2 + open + pvc	Low-Mod for historic	
Divisadero, Diamond, Illinois, 41 Fwy	562	NA 1885-1888; 1898: ; 190	Mod Sch on 3/4 + pvd	Low for historic	
Illinois, Diamond, Nevada, 41 Fwy	558	NA 1885-1888; 1898: ; 190	Mod Sch on 1/4 + open	Low-Mod for historic	
Nevada, Diamond, McKenzie, Angus	558	NA 1885-1898; 1906: ; 191	p1919 D on 3/4 + open	Low-Mod for historic	
Ventura, 41 Fwy, Gilbert, Callisch	555	NA 1885-1888; 1898: ; 190	Mod D on 3/4 + open	Low for historic	
Gilbert, 41 Fwy, Donahoo, Callisch	555	NA 1885-1888; 1898: ; 190	Mod D on 3/4 + open	Low for historic	
Donahoo, 41 Fwy, Balch, Callisch	552/555	NA 1885-1888; 1898: ; 190	Mod D on 3/4 + open	Low for historic	
Balch, 41 Fwy, Huntington, Callisch	552	NA 1885-1888; 1898: ; 190	Mod D on 3/4 + open	Low for historic	
Huntington, 41 Fwy, Tulare, Callisch	795/796	NA 1885-1898; 1906: ; 191	Mod D on 3/4 + open	Low for historic	
Ventura, Callisch, Gilbert, Orchard	556	NA 1885-1888; 1898: ; 190	Mod D on 3/4 + open	Low for historic	
Gilbert, Callisch, Donahoo, Raisina	556/557	NA 1885-1888; 1898: ; 190	Mod D on 3/4 + open	Low for historic	
Donahoo, Callisch, Balch, Raisina	553/554	NA 1885-1888; 1898: ; 190	Mod D on 3/4 + open	Low for historic	
Balch, Callisch, Huntington, Raisina	553/554	NA 1885-1888; 1898: ; 190	Mod D on 3/4 + open	Low for historic	
Huntington, Callisch, Platt, Orchard	793	NA 1885-1898; 1906: ; 191	Mod D on 3/4 + open	Low for historic	
Platt, Callisch, Tulare, Orchard	794	NA 1885-1898; 1906: ; 191	Mod D on 1/2 + open	Low for historic	
Tulare, 41 Fwy, Iowa, Orchard	929	NA 1885-1898; 1906: ; 191	Mos S on 1/3 + pvd	Low for historic	
Iowa, 41 Fwy, Illinois, Orchard	928	NA 1885-1898; 1906: ; 191	p1919 D on 3/4 + open	Low for historic	
Illinois, 41 Fwy, Nevada, Orchard	927	NA 1885-1898; 1906: ; 191	Mod D on 3/4 + open	Low for historic	
Nevada, 41 Fwy, McKenzie, Orchard	926	NA 1885-1898; 1906: ; 191	Mod D on 3/4 + open	Low for historic	
McKenzie, 41 Fwy, Washington, Orchard	925	NA 1885-1898; 1906: ; 191	p1919 D on 1/2 + open	Low for historic	
Washington, 41 Fwy, Grant, Orchard	924	NA 1885-1898; 1906: ; 191	p1919 D on 1/2 + open	Low for historic	
Grant, 41 Fwy, Madison, Orchard	923	NA 1885-1898; 1906: ; 191	p1950 D on 1/2 + open	Low for historic	
Madison, 41 Fwy, Belmont, Orchard	922	NA 1885-1898; 1906: ; 191	p1950 D on 1/2 + Mod S on 1	Low for historic	
Belmont, 41 Fwy, White, Orchard	921	NA 1885-1898; 1906: ; 191	p1950 D on 1/2 + Mod S on 1	Low for historic	
White, 41 Fwy, Thomas, Orchard	920	NA 1885-1898; 1906: ; 191	p1950 D on 1/2 + open + pvd	Low for historic	
Thomas, 41 Fwy, Orchard	919	NA 1885-1898; 1906: ; 191	Mod Ind on 1/3 + pvd	Low for historic	
Hazelwood, El Monte, 1st St	1125/1131	NA 1885-1906 ; 1918: ; 194	p1950 D on 3/4 + open	Low for historic	
El Monte, Hazelwood, Ventura, 1st St	799/800	NA 1885-1906 ; 1918: ; 194	p1950 D on 3/4 + open + pvd	Low for historic	
Ventura, Orchard, Gilbert, Raisina	557	NA 1885-1888; 1898: ; 190	Mod D on 1/2 + open	Low for historic	
Ventura, Raisina, (Mono), 1st St	787	NA 1885-1898: ; 1906: ; 19	Mod D on 1/2 + open	Low for historic	
Mono, Raisina, Huntington, 1st St	788	NA 1885-1898: ; 1906: ; 19	Mod D + Mod Ch on 1/2 + op	Low for historic	
Huntington, Orchard, Platt, 1st St	789/792	NA 1885-1898: ; 1906: ; 19	Mod Inst on 1/8 + open	Low for historic	
Platt, Orchard, Tulare, 1st St	790/791	NA 1885-1898: ; 1906: ; 19	Mod D on 1/2 + Mod S on 1/4	Low for historic	
Tulare, Orchard, Iowa, 1st St	916	NA 1885-1898: ; 1906: ; 19	p1919 D on 1/4 + Mod S on 1	Low for historic	
Iowa, Orchard, Illinois, 1st St	915	NA 1885-1898: ; 1906: ; 19	p1919 D on 3/4 + open	Low for historic	
Illinois, Orchard, Nevada, 1st St	914	NA 1885-1898: ; 1906: ; 19	p1919 D on 3/4 + open	Low for historic	

Nevada, Orchard, McKenzie, 1st St	913	NA 1885-1898: ; 1906: ; 19	p1950 D on 3/4 + open	Low for historic
McKenzie, Orchard, Washinton, 1st St	912	NA 1885-1898: ; 1906: ; 19	p1919 D on 3/4 + open	Low for historic
Washington, Orchard, Grant, 1st St	911	NA 1885-1898: ; 1906: ; 19	p1950 D on 3/4 + open	Low for historic
Grant, Orchard, Madison, 1st St	910	NA 1885-1906 ; 1918: ; 194	p1950 D on 3/4 + open	Low for historic
Madison, Orchard, Belmont, 1st St	909	NA 1885-1906 ; 1918: ; 194	p1919 D on 1/2 + Mod S on 1	Low for historic
Belmont, Orchard, White, 1st St	908	NA 1885-1906 ; 1918: ; 194	p1950 D on 1/2 + Mod S on 1	Low for historic
White, Orchard, Thomas, 1st St	905/906	NA 1885-1906 ; 1918: ; 194	p1950 D on 3/4 + open	Low for historic
Thomas, Orchard, 180 Fwy, 1st St	2488/2489	NA 1885-1906 ; 1918: ; 194	p1950 Inst on 1/8 + open	Low-Mod for historic
California, (Parallel), (Woodward), 2nd St	1232	NA 1885-1918; 1948:	p1950 Reservoir on 1/4 + ope	Low for historic
(Woodward), Parallel, (Braly), (2nd St)	1232	NA 1885-1918; 1948:	Mod Inds on 1/3 + pvd	Low for historic
(Braly), Parallel, Hamilton, 2nd St	1205	NA 1885-1918; 1948:	Mod Inds on all	Low for historic
Hamilton, Parallel, (Townsend), 2nd St	1176/1188	NA 1885-1918; 1948:	Mod Inds on 1/2 + pvd	Low for historic
(Townsend), Parallel, Butler, 2nd St	1166	NA 1885-1918; 1948:	p1950 D on 3/4 + open	Low for historic
Butler, Parallel, Lyell, 2nd St	1158	NA 1885-1918; 1948:	p1950 D on 3/4 + open	Low for historic
Lyell, Parallel, Liberty, 2nd St	1151	NA 1885-1918; 1948:	p1950 D on 3/4 + open	Low for historic
Liberty, Parallel, Lowe, 2nd St	1144	NA 1885-1918; 1948:	p1950 D on 3/4 + open	Low for historic
Lowe, 1st St, Alta, 2nd St	1136/1137	NA 1885-1918; 1948:	p1950 D on 1/2 + Mod D on 1	Low for historic
Alta, 1st St, Montecito, 2nd St	1132	NA 1885-1906; 1918: ; 194	p1950 D on 3/4 + open	Low for historic
Montecito, 1st St, El Monte, 2nd St	1126	NA 1885-1906; 1918: ; 194	p1950 D on 3/4 + open	Low for historic
El Monte, 1st St, Ventura, 2nd St	1120	NA 1885-1906; 1918: ; 194	p1950 D on 3/4 + open	Low for historic
Ventura, 1st St, Mono, 2nd St	756	NA 1885-1906; 1918: ; 194	p1950 D on 1/4 + Mod D on 1	Low for historic
Mono, 1st St, Balch, 2nd St	755	NA 1885-1906; 1918: ; 194	p1918 D on 3/4 + open	Low for historic
Balch, 1st St, Huntington, (2nd St)	734	NA 1885-1906; 1918: ; 194	p1918 D on 3/4 + open	Low for historic
Huntington, 1st St, Kerckhoff, (2nd St)	733	NA 1885-1906; 1918: ; 194	p1950 D on 3/4 + open	Low for historic
Kerckhoff, 1st St, Platt, (2nd St)	711	NA 1885-1906; 1918: ; 194	p1918 D on 3/4 + open	Low for historic
Platt, 1st St, Angus, (2nd St)	870	NA 1885-1906; 1918: ; 194	Mod S on 1/4 + pvd	Mod for historic Inds
Angus, 1st St, Tulare, 2nd St	849	NA 1885-1906; 1918: ; 194	Mod S on 1/4 + pvd	Mod for historic Inds
Tulare, 1st St, Iowa, 2nd St	848	NA 1885-1906; 1919: ; 194	p1919 D on 1/2 + Mod S on 1	Low-Mod for historic
Iowa, 1st St, Illinois, 2nd St	837	NA 1885-1906; 1919: ; 194	p1919 D on 3/4 + open	Low-Mod for historic
Illinois, 1st St, Nevada, 2nd St	836	NA 1885-1906; 1919: ; 194	p1919 D on 3/4 + open	Low for historic
Nevada, 1st St, McKenzie, 2nd St	825	NA 1885-1906; 1919: ; 194	p1919 D on 3/4 + open	Low for historic
McKenzie, 1st St, Washington, 2nd St	824	NA 1885-1906; 1919: ; 194	p1950 D on 3/4 + open	Low for historic
Washington, 1st St, Grant, 2nd St	813	NA 1885-1906; 1919: ; 194	p1950 D/Ch on 1/2 + open +	Low-Mod for historic
Grant, 1st St, Madison, 2nd St	812	NA 1885-1906; 1919: ; 194	p1950 D on 3/4 + open	Low for historic
Madison, 1st St, Belmont, 2nd St	801	NA 1885-1906; 1919: ; 194	p1950 D on 1/2 + Mod S + op	Low-Mod for historic
Belmont, 1st St, Thomas, 2nd St	904	NA 1885-1906; 1919: ; 194	p1950 D on 1/2 + Mod S + op	Low-Mod for historic
Thomas, 1st St, 180 Fwy, 2nd St	2490	NA 1885-1906; 1919: ; 194	p1950 D on 1/2 + open	Low for historic
California, (2nd St), (Woodward), 3rd St	1234	NA 1885-1919; 1948:	p1948 Inds on 1/2 + pvd + op	Low for historic
(Woodward), (2nd St), (Braly), 3rd St	NA	NA all maps	Mod Inds (?) on 1/2 + pvd	NA
(Braly), 2nd St, Hamilton, 3rd	1205	NA 1885-1919; 1948:	Mod Inds on all	Low for historic

Hamilton, 2nd St, Orleans, 3rd St	1189	NA 1885-1919; 1948:	p1948 D on 3/4 + open	Low for historic
Orleans, 2nd St, Townsend, 3rd St	1177	NA 1885-1919; 1948:	p1948 D on 3/4 + open	Low for historic
Townsend, 2nd St, Butler, 3rd St	1167	NA 1885-1919; 1948:	p1948 D on 3/4 + open	Low for historic
Butler, 2nd St, Lyell, 3rd St	1159	NA 1885-1919; 1948:	p1948 D on 3/4 + open	Low for historic
Lyell, 2nd St, Liberty, 3rd St	1152	NA 1885-1919; 1948:	p1948 D on 3/4 + open	Low for historic
Liberty, 2nd St, Lowe, 3rd St	1146	NA 1885-1919; 1948:	p1948 D on 3/4 + open	Low for historic
Lowe, 2nd St, Alta, 3rd St	1139	NA 1885-1919; 1948:	p1948 D on 3/4 + open	Low for historic
Alta, 2nd St, Montecito, 3rd St	1133	NA 1885-1919; 1948:	p1948 D on 3/4 + open	Low for historic
Montecito, 2nd St, El Monte, 3rd St	1127	NA 1885-1919; 1948:	p1948 D on 3/4 + open	Low for historic
El Monte, 2nd St, Ventura, 3rd St	1121	NA 1885-1919; 1948:	Mod S on 1/4 + pvd + open	Low for historic
Ventura, 2nd St, Mono, 3rd St	757	NA 1885-1919; 1948:	p1948 D on 3/4 + open + pvd	Low for historic
Mono, (2nd St), Balch, 3rd St	754	NA 1885-1919; 1948:	p1948 D on 3/4 + open	Low for historic
Balch, (2nd St), Huntington, 3rd St	735	NA 1885-1919; 1948:	p1948 D on 3/4 + open	Low for historic
Huntington, (2nd St), Kerckhoff, 3rd St	732	NA 1885-1919; 1948:	p1948 D on 3/4 + open	Low for historic
Kerckhoff, (2nd St), Platt, 3rd St	710	NA 1885-1919; 1948:	p1948 D on 3/4 + open	Low for historic
Platt, (2nd St), Angus, 3rd St	869	NA 1885-1919; 1948:	p1948 D on 1/2 + Mod S on 1	Low for historic
Angus, (2nd St), Tulare, 3rd St	850	NA 1885-1919; 1948:	All pvd	Mod for historic Inds
Tulare, 2nd St, Iowa, 3rd St	847	NA 1885-1906; 1919: ; 194	p1919 D on 1/2 + Mod S + pv	Low-Mod for historic
Iowa, 2nd St, Illinois, 3rd St	838	NA 1885-1906; 1919: ; 194	p1919 D on 3/4 + open	Low for historic
Illinois, 2nd St, Nevada, 3rd St	835	NA 1885-1906; 1919: ; 194	p1919 D on 3/4 + open	Low for historic
Nevada, 2nd St, McKenzie, 3rd St	826	NA 1885-1906; 1919: ; 194	p1949 D on 3/4 + open	Low for historic
McKenzie, 2nd St, Washington, 3rd St	823	NA 1885-1906; 1919: ; 194	p1949 D on 3/4 + open	Low for historic
Washington, 2nd St, Grant, 3rd St	814	NA 1885-1906; 1919: ; 194	p1949 D on 3/4 + open	Low for historic
Grant, 2nd St, Madison, 3rd St	811	NA 1885-1906; 1919: ; 194	p1949 D on 3/4 + open	Low for historic
Madison, 2nd St, Belmont, 3rd St	802	NA 1885-1906; 1919: ; 194	p1949 D on 1/2 + Mod S on 1	Low for historic
Belmont, 2nd, Thomas, Fisher	903	NA 1885-1906; 1919: ; 194	p1949 D on 3/4 + Mod S + pv	Low for historic
Thomas, 2nd St, 180 Fwy, Fisher	2491	NA 1885-1906; 1919: ; 194	p1949 D on 1/2 + Mod D + op	Low for historic
Belmont, Fisher, Thomas, 3rd St	902	NA 1885-1906; 1919: ; 194	p1949 D on 3/4 + Mod S + op	Low for historic
Thomas, Fisher, 180 Fwy, 3rd St	2492	NA 1885-1906; 1919: ; 194	p1949 D on 3/4 + Mod D + op	Low for historic
California, 3rd St, Woodward, Hazelwood	1236	NA 1885-1918; 1948:	Mod Inds on 1/4 + open + pv	Mod for historic
Woodward, 3rd St, Braly, Hazelwood	1221	NA 1885-1918; 1948:	p1948 D on 1/2 + open	Low for historic
Braly, 3rd St, Hamilton, Hazelwood	1207	NA 1885-1918; 1948:	p1948 D on 3/4 + open	Low for historic
Hamilton, 3rd St, Orleans, Hazelwood	1190	NA 1885-1918; 1948:	p1948 D on 3/4 + open	Low for historic
Orleans, 3rd St, Townsend, Hazelwood	1178	NA 1885-1918; 1948:	p1948 D on 3/4 + open	Low for historic
Townsend, 3rd St, Butler, Hazelwood	1168	NA 1885-1918; 1948:	p1948 D on 3/4 + open	Low for historic
California, Hazelwood, Woodward, 4th St	1236	NA 1885-1918; 1948:	Mod D on 3/4 + open	Low for historic
Woodward, Hazelwood, Braly, 4th St	1222	NA 1885-1918; 1948:	p1948 D on 3/4 + open	Low for historic
Braly, Hazelwood, Hamilton, 4th St	1208	NA 1885-1918; 1948:	p1948 D on 3/4 + open	Low for historic
Hamilton, Hazelwood, Orleans, 4th St	1191	NA 1885-1918; 1948:	p1948 D on 1/2 + open	Low for historic
Orleans, Hazelwood, Townsend, 4th St	1179	NA 1885-1918; 1948:	p1948 D on 3/4 + open	Low for historic

Townsend, Hazelwood, Butler, 4th St	1169	NA 1885-1918; 1948:	p1948 D + S on 1/2 + open	Low for historic
Butler, 3rd St, Lyell, Hazelwood	1160/1161	NA 1885-1906; 1918: ; 194	p1948 D on 3/4 + open	Low for historic
Lyell, 3rd St, Liberty, 4th St	1154	NA 1885-1906; 1918: ; 194	p1948 D on 3/4 + open	Low for historic
Liberty, 3rd St, Lowe, 4th St	1147	NA 1885-1906; 1918: ; 194	p1948 D on 3/4 + open	Low for historic
Lowe, 3rd St, Alta, 4th St	1140	NA 1885-1906; 1918: ; 194	p1948 D on 3/4 + open	Low for historic
Alta, 3rd St, Montecito, 4th St	1134	NA 1885-1906; 1918: ; 194	p1948 D on 3/4 + open	Low for historic
Montecito, 3rd St, El Monte, 4th St	1128	NA 1885-1906; 1918: ; 194	p1948 D on 3/4 + open	Low for historic
El Monte, 3rd St, Ventura, 4th St	1122	NA 1885-1906; 1918: ; 194	p1948 D on 1/2 Mod S on 1/4	Low for historic
Ventura, 3rd St, Mono, 4th St	758	NA 1885-1906; 1918: ; 194	p1948 D on 3/4 + open	Low for historic
Mono, 3rd St, Balch, 4th St	753	NA 1885-1906; 1918: ; 194	p1948 D on 3/4 + Ch + open	Low for historic
Balch, 3rd St, Huntington, 4th St	736	NA 1885-1906; 1918: ; 194	p1948 D on 3/4 + open	Low for historic
Huntington, 3rd St, Kerckhoff, 4th St	731	NA 1885-1906; 1918: ; 194	p1948 D on 3/4 + open	Low for historic
Kerckhoff, 3rd St, Platt, 4th St	709	NA 1885-1906; 1918: ; 194	p1918 D on 3/4 + open	Low for historic
Platt, 3rd St, Tulare, 4th St	868	NA 1885-1906; 1918: ; 194	p1948 D on 1'3 + Mod S on 1	Low for historic
Tulare, 3rd St, Iowa, 4th St	846	NA 1885-1906; 1919: ; 195	p1950 D on 3/4 + open	Low for historic
Iowa, 3rd St, Illinois, 4th St	839	NA 1885-1906; 1919: ; 195	p1950 D on 3/4 + open	Low for historic
Illinois, 3rd St, Nevada, 4th St	834	NA 1885-1906; 1919: ; 195	p1950 D on 3/4 + open	Low for historic
Nevada, 3rd St, McKenzie, 4th St	827	NA 1885-1906; 1919: ; 195	p1950 D on 3/4 + open	Low for historic
McKenzie, 3rd St, Washington, 4th St	822	NA 1885-1906; 1919: ; 195	p1950 D on 3/4 + open	Low for historic
Washington, 3rd St, Grant, 4th St	815	NA 1885-1906; 1919: ; 195	p1950 D on 3/4 + open	Low for historic
Grant, 3rd St, Madison, 4th St	810	NA 1885-1906; 1919: ; 195	p1950 D on 3/4 + open	Low for historic
Madison, 3rd St, Belmont, 4th St	803	NA 1885-1906; 1919: ; 195	p1950 D on 3/4 + open	Low for historic
Belmont, 3rd St, Thomas, Bond	901	NA 1885-1906; 1918: ; 194	p1949 D on 1/2 + Mod D on 1	Low for historic
Thomas, 3rd St, 180 Fwy, Bond	2493	NA 1885-1906; 1919: ; 195	p1950 D on 3/4 + open	Low for historic
Belmont, Bond, 180 Fwy, 4th St	2502	NA 1885-1906; 1919: ; 195	p1950 D on 3/4 + open	Low for historic
California, 4th St, Woodward, 5th St	1237	NA 1885-1918; 1948:	p1948 D on 3/4 + open	Low-Mod for historic
Woodward, 4th St, Braly, 5th St	1223	NA 1885-1918; 1948:	p1948 D on 3/4 + open	Low for historic
Braly, 4th St, Hamilton, 5th St	1209	NA 1885-1918; 1948:	p1948 D on 3/4 + open	Low for historic
Hamilton, 4th St, Orleans, 5th St	1192	NA 1885-1918; 1948:	p1948 D on 3/4 + open	Low for historic
Orleans, 4th St, Townsend, 5th St	1180	NA 1885-1918; 1948:	p1948 D on 3/4 + open	Low for historic
Townsend, 4th St, Butler, 5th St	1170	NA 1885-1918; 1948:	p1948 D on 3/4 + open	Low for historic
Butler, 4th St, Lyell, 5th St	1162	NA 1885-1906; 1918: ; 194	p1948 D on 3/4 + open	Low for historic
Lyell, 4th St, Liberty, 5th St	1155	NA 1885-1906; 1918: ; 194	p1948 D on 3/4 + open	Low for historic
Lberty, 4th St, Lowe, 5th St	1148	NA 1885-1906; 1918: ; 194	p1948 D on 3/4 + open	Low for historic
Lowe, 4th St, Alta, 5th St	1141	NA 1885-1906; 1918: ; 194	p1948 D on 3/4 + open	Low for historic
Alta, 4th St, Montecito, 5th St	1135	NA 1885-1906; 1918: ; 194	p1948 D on 3/4 + open	Low for historic
Montecito, 4th St, El Monte, 5th St	1129	NA 1885-1906; 1918: ; 194	p1948 D on 3/4 + open	Low for historic
El Monte, 4th St, Ventura, 5th St	1123	NA 1885-1906; 1918: ; 194	p1948 D on 3/4 + open	Low for historic
Ventura, 4th St, Mono, 5th St	759	NA 1885-1906; 1918: ; 194	p1948 D on 3/4 + open	Low for historic
Mono, 4th St, Balch, 5th St	752	NA 1885-1906; 1918: ; 194	p1918 D on 1/2 + p1948 D or	Low for historic

Balch, 4th St, Huntington, 5th St	737	NA 1885-1906; 1918: ; 194	p1918 D on 1/4 + p1948 D or	Low for historic
Huntington, 4th St, Kerckhoff, 5th St	730	NA 1885-1906; 1918: ; 194	p1948 D on 3/4 + open	Low for historic
Kerckhoff, 4th St, Platt, 5th St	708	NA 1885-1906; 1918: ; 194	p1948 D on 3/4 + open	Low for historic
Platt, 4th St, Tulare, 5th St	852/867	NA 1885-1906; 1918: ; 194	p1948 D on 1/3 + Mod S on 1	Low for historic
Tulare, 4th,Iowa, 5th	845	NA 1885-1906; 1919: ; 195	p1919 D on 1/4 + p1950 D or	Low for historic
Iowa, 4th, Illinois, 5th	840	NA 1885-1906; 1919: ; 195	p1919 on 3/4 + open	Low for historic
Illinois, 4th, Nevada, 5th	833	NA 1885-1906; 1919: ; 195	p1919 on 1/2 + Mod Inst on 1	Low for historic
Nevada, 4th, McKenzie, 5th	828	NA 1885-1906; 1919: ; 195	Mod Inst on 1/2 + pvd	Low-Mod for historic
McKenzie, 4th, Washington, 5th	821	NA 1885-1906; 1919: ; 195	p1919 D on 1/4 + p1950 D or	Low for historic
Washington, 4th, Grant, 5th	816	NA 1885-1906; 1919: ; 195	p1919 D on 1/4 + p1950 D or	Low for historic
Grant, 4th, Madison, 5th	809	NA 1885-1906; 1919: ; 195	p1919 D on 1/2 + p1950 D or	Low for historic
Madison, 4th, Belmont, 5th	804	NA 1885-1906; 1919: ; 195	p1950 on 1/2 + Mod S on 1/4	Low-Mod for historic
Belmont, 4th, White, 5th,	2507	NA 1885-1906; 1919: ; 195	p1950 on 1/2 + Mod S on 1/4	Low-Mod for historic
White, 4th, Thomas, 5th	2503	NA 1885-1906; 1919: ; 195	p1919 D on 1/4 + p1950 D or	Low for historic
Thomas, 4th, 180 Fwy, 5th	2495	NA 1885-1906; 1919: ; 195	p1950 on 3/4 + open	Low for historic
California, 5th, Woodward, Gearhart	NA	NA all maps	p1950 (?) on 3/4 + open	NA
Woodward, 5th, Braly, Gearhart	NA	NA all maps	p1950 (?) on 3/4 + open	NA
Braly, 5th, Hamilton, Gearhart	NA	NA all maps	p1950 (?) on 3/4 + open	NA
Hamilton, 5th, Townsend, Gearhart	NA	NA all maps	p1950 (?) on 3/4 + open	NA
Townsend, 5th, Butler, Gearhart	1171	NA 1885-1918; 1948:	p1948 D on 3/4 + Ch + open	Low for historic
Butler, 5th, Lyell, Orange	1163	NA 1885-1906; 1918: ; 194	p1948 D on 3/4 + open	Low for historic
Lyell, 5th, Liberty, Orange	1156	NA 1885-1906; 1918: ; 194	p1948 D on 1/2 + Mod D on 1	Low for historic
Liberty, 5th, Lowe, Orange	1149	NA 1885-1906; 1918: ; 194	p1948 D on 3/4 + open	Low for historic
Lowe, 5th, Alta, Orange	1142	NA 1885-1906; 1918: ; 194	p1948 D on 3/4 + open	Low for historic
Alta, 5th, Montecito, Orange	1136	NA 1885-1906; 1918: ; 194	p1948 D on 3/4 + open	Low for historic
Montecito, 5th, El Monte, Orange	1130	NA 1885-1906; 1918: ; 194	p1948 D on 3/4 + open	Low for historic
El Monte, 5th, Ventura, Orange	1124	NA 1885-1906; 1918: ; 194	p1948 D on 1/2 + Mod S on 1	Low for historic
Ventura, 5th, Mono, 6th	760	NA 1885-1906; 1918: ; 194	p1948 D on 3/4 + open	Low for historic
Mono, 5th, Balch, 6th	751	NA 1885-1906; 1918: ; 194	p1948 D on 3/4 + open	Low for historic
Balch, 5th, Huntington, 6th	738	NA 1885-1906; 1918: ; 194	p1948 D on 3/4 + open	Low for historic
Huntington, 5th, Kerckhoff, 6th	729	NA 1885-1906; 1918: ; 194	p1948 D on 3/4 + open	Low for historic
Kerckhoff, 5th, Platt, 6th	707	NA 1885-1906; 1918: ; 194	p1948 D on 3/4 + open	Low for historic
Platt, 5th, Tulare, 6th	866	NA 1885-1906; 1918: ; 194	p1948 D on 1/2 + Mod S on 1	Low for historic
Tulare, 5th, Iowa, 6th	844	NA 1885-1906; 1919: ; 195	p1950 D on 1/2 + Mod S on 1	Low for historic
Iowa, 5th, Illinois, 6th	841	NA 1885-1906; 1919: ; 195	p1919 D on 1/2 + p1950 D or	Low for historic
Illinois, 5th, Nevada, 6th	832	NA 1885-1906; 1919: ; 195	p1919 D on 1/2 + open	Mod for historic
Nevada, 5th, McKenzie, 6th	829	NA 1885-1906; 1919: ; 195	Mod Inst on 1/4 + open	Mod for historic
McKenzie, 5th, Washington, 6th	820	NA 1885-1906; 1919: ; 195	p1950 D on 3/4 + open	Low for historic
Washington, 5th, Grant, 6th	817	NA 1885-1906; 1919: ; 195	p1950 D on 3/4 + open	Low for historic
Grant, 5th, Madison, 6th	808	NA 1885-1906; 1919: ; 195	p1950 D on 3/4 + open	Low for historic

Madison, 5th, Belmont, 6th	805	NA 1885-1906; 1919: ; 195	p1919 D on 1/4 + Mod S on 1	Low for historic
Belmont, 5th, (Sioux), (6th)	2508	NA 1885-1906; 1919: ; 195	Mod S on 1/4 + open	Low-Mod for historic
(Sioux), 5th, Thomas, (6th)	2504	NA 1885-1906; 1919: ; 195	Mod Inst on 1/2 + pvd + oper	Low for historic
Thomas, 5th, 180 Fwy, 6th	2497	NA 1885-1906; 1919: ; 195	p1950 D on 3/4 + open	Low for historic
Butler, Orange, Lowe, 8th St	780-783	NA 1885-1906; 1918: ; 194	Mod Inst on 1/2 + Mod D on	Low-Mod for historic
Lowe, Orange, Alta, 8th St	779/784	NA 1885-1906; 1918: ; 194	p1948 D on 1/2 + Mod S on 1	Low for historic
Alta, Orange, El Monte, 7th	785	NA 1885-1906; 1918: ; 194	p1948 D on 3/4 + open	Low for historic
El Monte, Orange, Ventura, 7th	786	NA 1885-1906; 1918: ; 194	p1948 D on 1/2 + p1948 S or	Low for historic
Ventura, 6th, Mono, 7th	761	NA 1885-1906; 1918: ; 194	p1948 D on 1/2 + p1948 S or	Low for historic
Mono, 6th, Balch, 7th	750	NA 1885-1906; 1918: ; 194	p1918 D on 1/4 + p1948 D or	Low for historic
Balch, 6th, Huntington, 7th	739	NA 1885-1906; 1918: ; 194	p1948 D on 3/4 + open	Low for historic
Huntington, 6th, Kerckhoff, 7th	728	NA 1885-1906; 1918: ; 194	p1948 D on 3/4 + open	Low for historic
Kerckhoff, 6th, Platt, 7th	706	NA 1885-1906; 1918: ; 194	p1948 D on 3/4 + open	Low for historic
Platt, 6th, Tulare, 7th	865	NA 1885-1906; 1918: ; 194	p1948 D on 3/4 + open	Low for historic
Tulare, 6th, Iowa, 7th	843	NA 1885-1906; 1919: ; 195	p1950 D on 1/2 + Mod S on 1	Low for historic
Iowa, 6th, Illinois, 7th	842	NA 1885-1906; 1919: ; 195	p1919 D on 1/2 + p1950 D or	Low for historic
Illinois, 6th, Nevada, 7th	831	NA 1885-1906; 1919: ; 195	p1950 D on 3/4 + open	Low for historic
Nevada, 6th, McKenzie, 7th	830	NA 1885-1906; 1919: ; 195	p1950 D on 3/4 + open	Low for historic
McKenzie, 6th, Washington, 7th	819	NA 1885-1906; 1919: ; 195	p1950 D on 3/4 + open	Low for historic
Washington, 6th, Grant, 7th	818	NA 1885-1906; 1919: ; 195	p1950 D on 3/4 + open	Low for historic
Grant, 6th, Madison, 7th	807	NA 1885-1906; 1919: ; 195	p1950 D on 3/4 + open	Low for historic
Madison, 6th, Belmont, 7th	806	NA 1885-1906; 1919: ; 195	p1950 D on 1/4 + Mod S on 1	Low for historic
Belmont, (6th), (Sioux), Millbrook	2509	NA 1885-1906; 1919: ; 195	Mod S on 1/4 + open	Low-Mod for historic
(Sioux), (6th), Thomas, Millbrook	2505	NA 1885-1906; 1919: ; 195	Mod Inst on 1/2 + pvd	Low for historic
Thomas, 6th, 180 Fwy, Millbrook	2498	NA 1885-1919: ; 1950:	p1950 D on 1/2 Mod Inst on	Low for historic
Alta, 7th, El Monte, 8th St	778	NA 1885-1906; 1918: ; 194	p1948 D on 3/4 + open	Low for historic
El Monte, 7th, Ventura, 8th St	777	NA 1885-1906; 1918: ; 194	p1948 D on 1/8 + open	Mod-High for historic
Ventura, 7th, Mono, 8th St	762	NA 1885-1906; 1918: ; 194	Mod S on 1/2 + p1948 D on 1	Low for historic
Mono, 7th, Balch, 8th St	749	NA 1885-1906; 1918: ; 194	p1948 D on 3/4 + open	Low for historic
Balch, 7th, Huntington, 8th St	748	NA 1885-1906; 1918: ; 194	p1948 D on 3/4 + open	Low for historic
Huntington, 7th, Kerckhoff, 8th St	727	NA 1885-1906; 1918: ; 194	p1948 D on 3/4 + open	Low for historic
Kerckhoff, 7th, Platt, 8th St	705	NA 1885-1906; 1918: ; 194	Mod Inst on 1/2 + open	Low-Mod for historic
Platt, 7th, Tulare, 8th St	864	NA 1885-1906; 1918: ; 194	p1918 D on 1/3 + p1948 D or	Low for historic
Tulare, 7th, Iowa, 8th St	2590	NA 1885-1906; 1919: ; 195	p1919 D on 1/2 + p1950 on 1	Low for historic
Iowa, 7th, Illinois, 8th St	2580	NA 1885-1906; 1919: ; 195	p1919 D on 3/4 + open	Low for historic
Illinois, 7th, Nevada, 8th St	2570	NA 1885-1906; 1919: ; 195	p1919 D on 1/4 + p1950 on 1	Low for historic
Nevada, 7th, McKenzie, 8th St	2560	NA 1885-1906; 1919: ; 195	p1919 D on 1/4 + p1950 on 1	Low for historic
McKenzie, 7th, Washington, 8th St	2550	NA 1885-1906; 1919: ; 195	p1919 D on 1/4 + p1950 on 1	Low for historic
Washington, 7th, Grant, 8th St	2540	NA 1885-1906; 1919: ; 195	p1919 D on 1/4 + p1950 on 1	Low for historic
Grant, 7th, Madison, 8th St	2530	NA 1885-1906; 1919: ; 195	p1919 D on 1/4 + p1950 on 1	Low for historic

Madison, 7th, Belmont, 8th St	2520	NA 1885-1906; 1919: ; 195	p1950 on 1/2 + Mod S on 1/4	Low for historic
Belmont, (7th), White, 9th St	2512/2513	NA 1885-1906; 1919: ; 195	p1950 on 1/2 + Mod S on 1/4	Low for historic
White, (7th), Turner, 9th St	2510/2511	NA 1885-1906; 1919: ; 195	p1950 on 1/2 + Mod S on 1/4	Low-Mod for historic
Turner, (7th), Thomas, 8th St	2506	NA 1885-1919: ; 1950:	p1950 on 3/4 + open	Low for historic
Thomas, 7th, 180 Fwy, 8th St	NA	NA all maps	Mod Reservoir on 3/4 + open	NA
Butler, 8th St, Lyell, 10th St	NA	NA all maps	p1950 D (?) on 3/4 + open	NA
Lyell, 8th St, Liberty, 10th St	NA	NA all maps	p1950 D (?) on 3/4 + open	NA
Liberty, 8th St, Lowe, 10th St	NA	NA all maps	p1950 D (?) on 3/4 + open	NA
Lowe, 8th St, Ventura, 9th St	774-776	NA 1885-1906; 1918: ; 194	p1948 D on 3/4 + open	Low for historic
Ventura, 8th St, Mono, 9th St	763	NA 1885-1906; 1918: ; 194	p1948 D on 1/2 + p1948 S or	Low for historic
Mono, 8th St, Balch, 9th St	748	NA 1885-1906; 1918: ; 194	p1918 D on 1/2 + p1948 D or	Low for historic
Balch, 8th St, Huntington, 9th St	741	NA 1885-1906; 1918: ; 194	p1948 D on 3/4 + open	Low for historic
Huntington, 8th St, Kirckhoff, 9th St	726	NA 1885-1906; 1918: ; 194	p1948 D on 3/4 + open	Low for historic
Kirckhoff, 8th St, Platt, 9th St	704	NA 1885-1906; 1918: ; 194	p1948 D on 3/4 + open	Low for historic
Platt, 8th St, Tulare, 9th St	863	NA 1885-1906; 1918: ; 194	p1918 D on 1/3 + p1948 D or	Low for historic
Tulare, 8th St, Iowa, 9th St	2591	NA 1885-1906; 1919: ; 195	p1950 D on 1/2 + Mod S on 1	Low for historic
Iowa, 8th St, Illinois, 9th St	2581	NA 1885-1906; 1919: ; 195	p1919 D on 1/4 + p1950 D or	Low for historic
Illinois, 8th St, Nevada, 9th St	2571	NA 1885-1906; 1919: ; 195	p1919 D on 1/4 + p1950 D or	Low for historic
Nevada, 8th St, McKenzie, 9th St	2561	NA 1885-1906; 1919: ; 195	p1919 D on 1/4 + p1950 D or	Low for historic
McKenzie, 8th St, Washington, 9th St	2551	NA 1885-1906; 1919: ; 195	p1950 Don 3/4 + open	Low for historic
Washington, 8th St, Grant, 9th St	2541	NA 1885-1906; 1919: ; 195	p1919 D on 1/4 + p1950 D or	Low for historic
Grant, 8th St, Madison, 9th St	2531	NA 1885-1906; 1919: ; 195	p1950 D on 3/4 + open	Low for historic
Madison, 8th St, Belmont, 9th St	2521	NA 1885-1906; 1919: ; 195	p1950 D on 1/2 + Mod S on 1	Low for historic
Turner, 8th St, Thomas, 9th St	2501	NA 1885-1919: ; 1950:	p1950 D on 3/4 + open	Low for historic
Thomas, 8th St, 180 Fwy, 9th St	NA	NA all maps	p1950 D (?) on 3/4 + open	NA
Lowe, 9th St, Lane, 10th St	769	NA 1885-1906; 1918: ; 194	p1948 D on 1/4 + Mod D on 1	Low for historic
Lane, 9th St, (Alta), 10th St	497/768	NA 1885-1906; 1918: ; 194	p1948 D on 1/4 + Mod Inst o	Low-Mod for historic
(Alta), 9th St, Ventura, 10th St	767/1337	NA 1885-1906; 1918: ; 194	p1948 D on 1/4 + Mod Inst or	Mod for historic
Ventura, 9th St, Mono, 10th St	764	NA 1885-1906; 1918: ; 194	p1948 D on 1/2 + Mod S on 1	Low for historic
Mono, 9th St, Balch, 10th St	747	NA 1885-1906; 1918: ; 194	p1918 D on 1/2 + Mod Inst o	Low-Mod for historic
Balch, 9th St, Huntongton, 10th St	742	NA 1885-1906; 1918: ; 194	p1948 D on 3/4 + open	Low for historic
Huntington, 9th St, Kirckhoff, 10th St	725	NA 1885-1906; 1918: ; 194	p1948 D on 3/4 + open	Low for historic
Kirckhoff, 9th St, Platt, 10th St	703	NA 1885-1906; 1918: ; 194	p1948 D on 3/4 + open	Low for historic
Platt, 9th St, Tulare, 10th St	362	NA 1885-1906; 1918: ; 194	p1948 D on 3/4 + open	Low for historic
Tualre, 9th St, Iowa, 11th St	2592	NA 1885-1906; 1919: ; 195	p1950 D on 3/4 + open	Low for historic
Iowa, 9th St, Illinois, 11th St	2582	NA 1885-1906; 1919: ; 195	p1950 D on 3/4 + open	Low for historic
Illinois, 9th St, Nevada, 11th St	2572	NA 1885-1906; 1919: ; 195	p1919 D on 1/2 + p1950 D or	Low for historic
Nevada, 9th St, McKenzie, 11th St	2562	NA 1885-1906; 1919: ; 195	p1919 D on 1/4 + p1950 D or	Low for historic
McKenzie, 9th St, Washington, 11th St	2552	NA 1885-1906; 1919: ; 195	p1919 D on 1/4 + p1950 D or	Low for historic
Washington, 9th St, Grant, 11th St	2542	NA 1885-1906; 1919: ; 195	p1950 D on 3/4 + open	Low for historic

Grant, 9th St, Madison, 11th St	2532	NA 1885-1906; 1919: ; 195	p1950 D on 3/4 + open	Low for historic
Madison, 9th St, Belmont, 11th St	2522	NA 1885-1906; 1919: ; 195	p1950 D on 1/2 + Mod S on 1	Low for historic
Belmont, 9th St, White, Plaza	2517	NA 1885-1906; 1919: ; 195	Mod D on 1/2 + Mod S on 1/4	Low for historic
White, 9th St, Turner, (11th St)	2516	NA 1885-1906; 1919: ; 195	Mod D on 3/4 + open	Low for historic
Turner, 9th St, Thomas, (11th St)	2515	NA 1885-1906; 1919: ; 195	Mod D on 3/4 + open	Low for historic
Thomas, 9th St, 180 Fwy, 11th St	2514	NA 1885-1906; 1919: ; 195	Mod D on 3/4 + open	Low for historic
Butler, 10th St, Lyell, 11th St	NA	NA all maps	p1950 (?) on 3/4 + open	NA
Lyell, 10th St, Liberty, 11th St	NA	NA all maps	p1950 (?) on 3/4 + open	NA
Liberty, 10th St, Lowe, 11th St	NA	NA all maps	p1950 (?) on 3/4 + open	NA
Lowe, 10th St, Lane, 11th St	1345	NA 1885-1918: ; 1948:	p1948 D on 3/4 + open	Low for historic
Lane, 10th St, Raco, Cedar	1339	NA 1885-1918: ; 1948:	p1948 D on 3/4 + open	Low for historic
Raco, 10th St, Alta, Cedar	1332	NA 1885-1918: ; 1948:	p1948 D on 3/4 + open	Low for historic
Alta, 10th St, Montecito, Cedar	1347	NA 1885-1918: ; 1948:	p1948 D on 3/4 + open	Low for historic
Montecito, 10th St, El Monte, Cedar	1340	NA 1885-1918: ; 1948:	p1948 D on 3/4 + open	Low for historic
El Monte, 10th St, Ventura, Cedar	1333	NA 1885-1918: ; 1948:	Mod D on 1/2 + Mod S on 1/4	Low for historic
Ventura, 10th St, Mono, 11th St	765	NA 1885-1918: ; 1948:	p1948 D on 1/2 + Mod S on 1	Low-Mod for historic
Mono, 10th St, Balch, 11th St	746	NA 1885-1918: ; 1948:	p1948 D on 3/4 + open	Low for historic
Balch, 10th St, Huntington, 11th St	743	NA 1885-1918 ; 1948:	p1948 D on 3/4 + open	Low for historic
Huntington, 10th St, Kerkhoff, 11th St	724	NA 1885-1918 ; 1948:	p1948 D on 3/4 + open	Low for historic
Kerckhoff, 10th St, Platt, 11th St	702	NA 1885-1918 ; 1948:	p1948 D on 3/4 + open	Low for historic
Platt, 10th St, Tulare, 11th St	861	NA 1885-1918 ; 1948:	p1948 D on 3/4 + open	Low for historic
Butler, 11th St, Lyell, Cedar	NA	NA all maps	p1948 D (?) on 3/4 + open	NA
Lyell, 11th St, Liberty, Cedar	NA	NA all maps	p1948 D (?) on 3/4 + open	NA
Liberty, 11th St, Lowe, Cedar	1508	NA 1885-1918 ; 1948:	p1948 D on 3/4 + open	Low for historic
Lowe, 11th St, Lane, Cedar	1509	NA 1885-1918 ; 1948:	p1948 D on 3/4 + open	Low for historic
Ventura, 11th St, Mono, Cedar	766	NA 1885-1918 ; 1948:	p1948 D on 1/4 + Mod Inst o	Low-Mod for historic
Mono, 11th St, Balch, Cedar	745	NA 1885-1918 ; 1948:	p1948 D on 1/4 + Mod Inst o	Low for historic
Balch, 11th St, Huntington, Cedar	744	NA 1885-1918 ; 1948:	p1948 D on 3/4 + open	Low for historic
Huntington, 11th St, Kerckhoff, Cedar	723	NA 1885-1918 ; 1948:	p1948 D on 3/4 + open	Low for historic
Kerckhoff, 11th St, Platt, Cedar	701	NA 1885-1918 ; 1948:	p1948 D on 3/4 + open	Low for historic
Platt, 11th St, Tulare, Cedar	859/860	NA 1885-1918 ; 1948:	p1948 D on 3/4 + open	Low for historic
Tulare, 11th St, Iowa, Cedar	2593	NA 1885-1906; 1919: ; 195	p1950 D on 3/4 + open	Low for historic
Iowa, 11th St, Illinois, Cedar	2583	NA 1885-1906; 1919: ; 195	p1950 D on 3/4 +open	Low for historic
Illinois, 11th St, Nevada, Cedar	2573	NA 1885-1906; 1919: ; 195	p1919 D on 1/4 + p1950 D o	Low for historic
Nevada, 11th St, McKenzie, Cedar	2563	NA 1885-1906; 1919: ; 195	p1919 D on 1/4 + p1950 D o	Low for historic
McKenzie, 11th St, Washington, Cedar	2553	NA 1885-1906; 1919: ; 195	p1919 D on 1/2 + p1950 D o	Low for historic
Washington, 11th St, Grant, Cedar	2543	NA 1885-1906; 1919: ; 195	p1950 D on 1/2 + Mod D on	Low for historic
Grant, 11th St, Madison, Cedar	2533	NA 1885-1906; 1919: ; 195	p1950 D on 3/4 +open	Low for historic
Madison, 11th St, Belmont, Cedar	2523	NA 1885-1906; 1919: ; 195	p1950 D on 1/2 + Mod S on 1	Low for historic
Belmont, Plaza, White, Cedar	2524	NA 1885-1906; 1919: ; 195	Mod S on 1/2 + pvd	Low for historic

White, (11th St), Turner, Cedar	2525	NA 1885-1906; 1919: ; 195	Mod D on 1/2 + pvd	Low for historic
Turner, (11th St), Thomas, Cedar	2519	NA 1885-1906; 1919: ; 195	Mod D on 1/2 + pvd	Low for historic
Thomas, 11th St, 180 Fwy, Cedar	2518	NA 1885-1906; 1919: ; 195	Mod D on 1/2 + pvd	Low for historic
Lane, Cedar, Kings Cyn, Archie	1334/1341/1	NA 1885-1918; 1948:	p1948 D on 3/4 + open	Low for historic
Ventura, Cedar, Chance	1317	NA 1885-1918; 1948:	All pvd	Low for historic
Chance, Cedar, Huntington, (Rowell)	1315/1316	NA 1885-1918; 1948:	Mod Hosp on 3/4 + pvd	Low for historic
Huntington, Cedar, Tulare, (Rowell)	1301/1308	NA 1885-1918; 1948:	p1948 Sch on 1/4 + pvd + op	Low for historic
Tulare, Cedar, Iowa, Rowell	2594	NA 1885-1918; 1950:	p1950 D on 1/3 + Mod S on 1	Low for historic
Iowa, Cedar, Illinois, Rowell	2584	NA 1885-1918; 1950:	p1950 D on 3/4 + open	Low for historic
Illinois, Cedar, Nevada, Rowell	2574	NA 1885-1918; 1950:	p1950 D on 3/4 + open	Low for historic
Nevada, Cedar, McKenzie, Rowell	2564	NA 1885-1918; 1950:	p1950 D on 3/4 + open	Low for historic
McKenzie, Cedar, Washington, Rowell	2554	NA 1885-1918; 1950:	p1950 D on 3/4 + open	Low for historic
Washington, Cedar, Grant, Rowell	2544	NA 1885-1918; 1950:	p1950 D on 3/4 + open	Low for historic
Grant, Cedar, Madison, Rowell	2534	NA 1885-1918; 1950:	p1950 D on 3/4 + open	Low for historic
Madison, Cedar, Belmont, Rowell	2528	NA 1885-1918; 1950:	p1950 D on 1/2 + Mod S on 1	Low for historic
Belmont, Cedar, White, Rowell	2527	NA 1885-1918; 1950:	p1950 D on 1/2 + Mod S on 1	Low for historic
White, Cedar, Turner, Rowell	2526	NA 1885-1918; 1950:	p1950 D on 3/4 + open	Low for historic
Turner, Cedar, Thomas, Rowell	2853	NA 1885-1918; 1950:	p1950 D on 3/4 + open	Low for historic
Thomas, Cedar, 180 Fwy, Rowell	2842	NA 1885-1918; 1950:	Mod D on 3/4 + open	Low for historic
Lane, Archie, Kings Cyn, Boyd	1335/1342/1	NA 1885-1918 ; 1948:	p1948 D on 3/4 + open	Low for historic
Lane, Boyd, Kings Cyn, Chase	1336/1343/1	NA 1885-1918 ; 1948:	p1948 D on 3/4 + open	Low for historic
Kings Cyn, (Rowell), Huntington, Barton	498	NA 1885-1918 ; 1948:	p1948 Inst + Mod Inst on 1/4	Mod for historic
Huntington, (Rowell), Tulare, Barton	1302/1309	NA 1885-1918 ; 1948:	p1948 Inst + Mod Inst on 1/4	Low for historic
Tualre, Rowell, Iowa, Barton	2920	NA 1885-1918; 1950:	p1950 D on 1/2 + Mod S on 1	Low for historic
Iowa, Rowell, Illinois, Barton	2910	NA 1885-1918; 1950:	p1950 D on 3/4 + open	Low for historic
Illinois, Rowell, Nevada, Barton	2900	NA 1885-1918; 1950:	p1950 D on 3/4 + open	Low for historic
Nevada, Rowell, McKenzie, Barton	2890	NA 1885-1918; 1950:	p1950 D on 3/4 + open	Low for historic
McKenzie, Rowell, Washington, Barton	2880	NA 1885-1918; 1950:	p1950 D on 3/4 + open	Low for historic
Washington, Rowell, Grant, Barton	2870	NA 1885-1918; 1950:	p1950 D on 3/4 + open	Low for historic
Grant, Rowell, Madison, Barton	2860	NA 1885-1918; 1950:	p1950 D on 3/4 + open	Low for historic
Madison, Rowell, Belmont, Barton	2536	NA 1885-1918; 1950:	p1950 D on 1/2 + Mod S on 1	Low for historic
Belmont, Rowell, (White), Barton	2535	NA 1885-1918; 1950:	Mod S on 1/4 + pvd + open	Low for historic
(White), Rowell, (Turner), Barton	2529	NA 1885-1918; 1950:	Mod Inst on 1/4 + pvd + oper	Low for historic
(Turner), Rowell, Thomas, Barton	2854	NA 1885-1918; 1950:	Mod Inst on 1/2 + pvd	Low for historic
Thomas, Rowell, 180 Fwy, Barton	2843	NA 1885-1918; 1950:	p1950 D on1/24 + open	Low for historic
Kings Cyn, Barton, Mono, Jackson	421	NA 1885-1906; 1918: ; 194	p1948 D on 1/2 + Mod S on 1	Low for historic
Mono, Barton, Inyo, Jackson	421 1/2	NA 1885-1918; 1948:	p1948 D on 3/4 + open	Low for historic
Inyo, Barton, Balch, Jackson	420 1/2	NA 1885-1918; 1948:	p1948 D on 3/4 + open	Low for historic
Balch, Barton, Huntington, Barton	420	NA 1885-1918; 1948:	p1948 D on 3/4 + open	Low for historic
Huntington, Barton, Fillmore, Hayston	1310	NA 1885-1918; 1948:	p1948 D on 3/4 + open	Low for historic

Huntington, Hayston, Fillmore, Jackson	1311	NA 1885-1918; 1948:	p1948 D on 3/4 + open	Low for historic
Fillmore, Barton, Tulare, Hayston	1303	NA 1885-1918; 1948:	p1948 D on 3/4 + open	Low for historic
Fillmore, Hayston, Tulare, Jackson	1304	NA 1885-1918; 1948:	p1948 D on 3/4 + open	Low for historic
Tulare, Barton, Iowa, Jackson	2921	NA 1885-1918; 1950:	p1950 D on 3/4 + open	Low for historic
Iowa, Barton, Illinois, Jackson	2911	NA 1885-1918; 1950:	p1950 D on 3/4 + open	Low for historic
Illinois, Barton, Nevada, Jackson	2901	NA 1885-1918; 1950:	p1950 D on 3/4 + open	Low for historic
Nevada, Barton, McKenzie, Jackson	2891	NA 1885-1918; 1950:	p1950 D on 2/3 + open	Low for historic
McKenzie, Barton, Washington, Jackson	2881	NA 1885-1918; 1950:	p1950 D on 2/3 + open	Low for historic
Washington, Barton, Grant, Jackson	2871	NA 1885-1918; 1950:	p1950 D on 3/4 + open	Low for historic
Grant, Barton, Madison, Jackson	2861	NA 1885-1918; 1950:	p1950 D on 3/4 + open	Low for historic
Madison, Barton, Belmont, Jackson	2539	NA 1885-1918; 1950:	p1950 D on 1/2 + 1/4 Mod S	Low for historic
Belmont, Barton, White, Jackson	2538	NA 1885-1918; 1950:	Mod S on 1/2 + pvd	Low for historic
White, Barton, Turner, Jackson	2537	NA 1885-1918; 1950:	p1950 D on 3/4 + open	Low for historic
Turner, Barton, Thomas, Jackson	2855	NA 1885-1918; 1950:	Mod D on 1/2 + Mod S on 1/4	Low for historic
Thomas, Barton, 180 Fwy, Jackson	2844	NA 1885-1918; 1950:	Mod D on 3/4 + open	Low for historic
Kings Cyn, Jackson, Mono, Maple	422	NA 1885-1918; 1948:	p1948 D on 1/4 + Mod S on 1	Low for historic
Mono, Jackson, Inyo, Maple	1357	NA 1885-1918; 1948:	p1948 D on 3/4 + open	Low for historic
Inyo, Jackson, Balch, Maple	1327	NA 1885-1918; 1948:	p1948 D on 3/4 + open	Low for historic
Balch, Jackson, Huntington, Maple	419	NA 1885-1918; 1948:	p1948 D on 3/4 + open	Low for historic
Huntington, Jackson, Fillmore, Meridian	1312	NA 1885-1918; 1948:	p1948 D on 3/4 + open	Low for historic
Huntington, Meridian, Fillmore, Maple	1313	NA 1885-1918; 1948:	p1948 D on 3/4 + open	Low for historic
Fillmore, Jackson, Tulare, Meridian	1305	NA 1885-1918; 1948:	p1948 D on 3/4 + open	Low for historic
Fillmore, Meridian, Tulare, Maple	1306	NA 1885-1918; 1948:	p1948 D on 3/4 + open	Low for historic
Tulare, Jackson, Iowa, Maple	2922	NA 1885-1918; 1950:	p1950 D on 1/2 + Mod Ch on	Low for historic
Iowa, Jackson, Illinois, Maple	2912	NA 1885-1918; 1950:	p1950 D on 3/4 + open	Low for historic
Illinois, Jackson, Nevada, Maple	2902	NA 1885-1918; 1950:	p1950 D on 3/4 + open	Low for historic
Nevada, Jackson, McKenzie, Maple	2892	NA 1885-1918; 1950:	p1950 D on 3/4 + open	Low for historic
McKenzie, Jackson, Washington, Maple	2882	NA 1885-1918; 1950:	p1950 D on 3/4 + open	Low for historic
Washington, Jackson, Grant, Maple	2872	NA 1885-1918; 1950:	p1950 D on 3/4 + open	Low for historic
Grant, Jackson, Madison, Maple	2862	NA 1885-1918; 1950:	p1950 D on 3/4 + open	Low for historic
Madison, Jackson, Belmont, Maple	2547	NA 1885-1918; 1950:	p1950 D on 1/2 + Mod S on 1	Low for historic
Belmont, Jackson, White, Maple	2546	NA 1885-1918; 1950:	Mod S on 1/4 + pvd	Low for historic
White, Jackson, Turner, Maple	2545	NA 1885-1918; 1950:	p1950 D on 1/2 + Mod Inds o	Low for historic
Turner, Jackson, (Thomas), Maple	2822	NA 1885-1918; 1950:	Mod Inds on 1/2 + pvd	Low for historic
(Thomas), Jackson, 180 Fwy, Maple	2812	NA 1885-1918; 1950:	Mod Inds on 1/4 + pvd	Low for historic
Kings Cyn, Maple, Mono, Backer	1359	NA 1885-1918; 1948:	Mod D on 1/4 + Mod S on 1/4	Low-Mod for historic
Mono, Maple, Inyo, Backer	1358	NA 1885-1918; 1948:	Mod D on 3/4 + pvd	Low for historic
Inyo, Maple, Huntington, Backer	1318/1319	NA 1885-1918; 1948:	Mod D on 1/2 + Mod Inds on	Low for historic
Huntington, Maple, Fillmore, Backer	1314	NA 1885-1918; 1948:	p1948 D on 1/4 + Mod D on 1	Low-Mod for historic
Fillmore, Maple, Tulare, Backer	1307	NA 1885-1918; 1948:	p1948 D on 1/2 + Mod S on 1	Low for historic

Tualre, Maple, Iowa, Backer	2923	NA 1885-1918; 1950:	p1950 D on 3/4 + open	Low for historic
Iowa, Maple, Illinois, Backer	2913	NA 1885-1918; 1950:	p1950 D on 3/4 + open	Low for historic
Illinois, Maple, Nevada, Backer	2903	NA 1885-1918; 1950:	p1950 D on 3/4 + open	Low for historic
Nevada, Maple, McKenzie, Backer	2893	NA 1885-1918; 1950:	p1950 D on 3/4 + open	Low for historic
McKenzie, Maple, Washington, Backer	2883	NA 1885-1918; 1950:	p1950 D on 3/4 + open	Low for historic
Washington, Maple, Grant, Backer	2873	NA 1885-1918; 1950:	p1950 D on 3/4 + open	Low for historic
Grant, Maple, Madison, Backer	2863	NA 1885-1918; 1950:	p1950 D on 3/4 + open	Low for historic
Madison, Maple, Belmont, Backer	2555	NA 1885-1918; 1950:	p1950 D on 1/2 + Mod S on 1	Low for historic
Belomnt, Maple, White, Backer	2549	NA 1885-1918; 1950:	Mod D 1/4 + Mod S on 1/4 +	Low for historic
White, Maple, Turner, Backer	2546	NA 1885-1918; 1950:	Mod D 1/4 + Mod S on 1/4 +	Low for historic
Turner, Maple, Thomas, Backer	2856	NA 1885-1918; 1950:	Mod Inds 1/2 + pvd	Low for historic
Thomas, Maple, 180 Fwy, Backer	2845	NA 1885-1918; 1950:	Mod Inds 2/3 + pvd	Low for historic
Kings Cyn, Backer, Huntington, Woodrow	1360	NA 1885-1918; 1948:	p1948 D on 3/4 + open	Low for historic
Huntington, Backer, Fillmore, Woodrow	1351	NA 1885-1918; 1948:	p1948 D on 3/4 + open	Low for historic
Fillmore, Backer, Tulare. Woodrow	1320	NA 1885-1918; 1948:	p1948 D on 3/4 + open	Low for historic
Kings Cyn, Woodrow, Huntington, Sierra Vista	1361	NA 1885-1918; 1948:	p1948 D on 3/4 + open	Low for historic
Huntington, Woodrow, Fillmore, Sierra Vista	1352	NA 1885-1918; 1948:	p1948 D on 1/4 + Mod D on 1	Low for historic
Fillmore, Woodrow, Tulare, Sierra Vista	1321	NA 1885-1918; 1948:	p1948 D on 1/2 + Mod D on 1	Low for historic
Tulare, Backer, Iowa, Sierra Vista	2924	NA 1885-1918; 1950:	p1950 D on 3/4 + open	Low for historic
Iowa, Backer, Illinois, Sierra Vista	2914	NA 1885-1918; 1950:	p1950 D on 3/4 + open	Low for historic
Illinois, Backer, Nevada, Sierra Vista	2904	NA 1885-1918; 1950:	p1950 D on 3/4 + open	Low for historic
Nevada, Backer, McKenzie, Sierra Vista	2894	NA 1885-1918; 1950:	p1950 D on 1/2 _ Mod D on 3	Low for historic
McKenzie, Backer, Washington, Sierra Vista	2884	NA 1885-1918; 1950:	p1950 D on 1/2 _ Mod D on 3	Low for historic
Washington, Backer, Grant, Sierra Vista	2874	NA 1885-1918; 1950:	p1950 D on 3/4 + open	Low for historic
Grant, Backer, Madison, Sierra Vista	2864	NA 1885-1918; 1950:	p1950 D on 3/4 + open	Low for historic
Madison, Backer, Belmont, Sierra Vista	2558	NA 1885-1918; 1950:	p1950 D on 1/2 + Mod S on 1	Low for historic
Belmont, Backer, White, Sierra Vista	2557	NA 1885-1918; 1950:	p1950 D on 1/2 + Mod S on 1	Low for historic
White, Backer, Turner, Sierra Vista	2556	NA 1885-1918; 1950:	p1950 D on 3/4 + open	Low for historic
Turner, Backer, Thomas, Sierra Vista	2847	NA 1885-1918; 1950:	p1950 D on 3/4 + open	Low for historic
Thomas, Backer, 180 Fwy, Sierra Vista	2856	NA 1885-1918; 1950:	p1950 D on 1/4 + Mod D on 1	Low for historic
Kings Cyn, Sierra Vista, Huntington, Whitney	1362	NA 1885-1918; 1948:	p1948 D on 3/4 + open	Low for historic
Kings Cyn, Whitney, Huntington, Recreation	1363	NA 1885-1918; 1948:	p1948 D on 3/4 + open	Low for historic
Huntington, Sierra Vista, Kirckhoff, Recreation	1354	NA 1885-1918; 1948:	p1948 D on 3/4 + open	Low for historic
Kirckhoff, Sierra Vista, Fillmore, Recreation	1353	NA 1885-1918; 1948:	p1948 D on 3/4 + open	Low for historic
Fillmore, Sierra Vista, Platt, Recreation	1323	NA 1885-1918; 1948:	p1948 D on 3/4 + open	Low for historic
Platt, Sierra Vista, Tulare, Recreation	1322	NA 1885-1918; 1948:	p1948 D on 3/4 + open	Low for historic
Tulare, Sierra Vista, (Iowa), Recreation	2925	NA 1885-1918; 1950:	Mod Sch on 1/2 + open	Low for historic
(Iowa), Sierra Vista, Illinois, Recreation	2915	NA 1885-1918; 1950:	Mod Sch on 1/2 + open + pvc	Low for historic
Illinois, Sierra Vista, Nevada, Recreation	2905	NA 1885-1918; 1950:	p1950 D on 3/4 + open	Low for historic
Nevada, Sierra Vista, McKenzie, Recreation	2895	NA 1885-1918; 1950:	p1950 D on 3/4 + open	Low for historic

McKenzie, Sierra Vista, Washington, Recreation	2885	NA 1885-1918; 1950:	p1950 D on 1/2 + Mod D on 1	Low for historic
Washington, Sierra Vista, Grant, Recreation	2875	NA 1885-1918; 1950:	p1950 D on 3/4 + open	Low for historic
Grant, Sierra Vista, Madison, Recreation	2865	NA 1885-1918; 1950:	p1950 D on 3/4 + open	Low for historic
Madison, Sierra Vista, Belmont, Recreation	2855	NA all maps	p1950 D on 1/2 + Mod S on 1	NA
Belmont, Sierra Vista, White, Recreation	2555	NA all maps	p1950 D on 1/2 + Mod S on 1	NA
White, Sierra Vista, Turner, Recreation	2509	NA all maps	p1950 D (?) on 3/4 + open	NA
Turner, Sierra Vista, Thomas, Recreation	2858	NA all maps	p1950 D (?) on 3/4 + open	NA
Thomas, Sierra Vista, 180 Fwy, Recreation	2847	NA all maps	p1950 D (?) on 3/4 + open	NA
Kings Cyn, Recreation, Huntington, Dearing	1364	NA 1885-1918; 1948:	p1948 D on 1/2 + Mod D on 1	Low-Mod for historic
Huntington, Recreation, Fillmore, Dearing	1355	NA 1885-1918; 1948:	p1948 D on 3/4 + open	Low for historic
Fillmore, Recreation, Tulare, Dearing	1324	NA 1885-1918; 1948:	p1948 D on 3/4 + open	Low for historic
Kings Cyn, Dearing, Huntington, Chestnut	1365	NA 1885-1918; 1948:	p1948 D on 1/2 + Mod D on 1	Low-Mod for historic
Huntington, Dearing, Fillmore, Chestnut	1356	NA 1885-1918; 1948:	p1948 D on 1/2 + Mod D on 1	Low for historic
Fillmore, Dearing, Tulare, Chestnut	1325	NA 1885-1918; 1948:	p1948 D on 3/4 + open	Low for historic
Tulare, Recreation, Iowa, Chestnut	2926	NA all maps	p1950 D on 1/2 + Mod S on 1	NA
Iowa, Recreation, Illinois, Chestnut	2916	NA all maps	p1950 D (?) on 3/4 + open	NA
Illinois, Recreation, Nevada, Chestnut	2906	NA all maps	p1950 D (?) on 3/4 + open	NA
Nevada, Recreation, McKenzie, Chestnut	2896	NA all maps	p1950 D (?) on 3/4 + open	NA
McKenzie, Recreation, Washington, Chestnut	2886	NA all maps	p1950 D (?) on 3/4 + open	NA
Washington, Recreation, Grant, Chestnut	2876	NA all maps	p1950 D (?) on 3/4 + open	NA
Grant, Recreation, Madison, Chestnut	2866	NA all maps	p1950 D (?) on 3/4 + open	NA
Madison, Recreation, Belmont, Chestnut	2569	NA all maps	p1950 D on 1/4 + Mod S on 1	NA
Belmont, Recreation, White, Chestnut	2568	NA all maps	p1950 D on 1/4 + Mod S on 1	NA
White, Recreation, Turner, Chestnut	2567	NA all maps	p1950 D (?) on 3/4 + open	NA
Turner, Recreation, Thomas, Chestnut	2859	NA all maps	p1950 D (?) on 3/4 + open	NA
Thomas, Recreation, 180 Fwy, Chestnut	2848	NA all maps	p1950 D (?) on 3/4 + open	NA

Sanborn Map Summary Abbreviations Key

fr – wood frame

brk/br – brick

blk – block

bsmt – basement

conc – concrete

mult – multiple (more than 12)

pvd – paved

D – dwelling

S – store/commercial

FB – female boarding

Chin – Chinese

Jap – Japanese

Mex – Mexican

O – outbuilding

Brn – barn

A – auto (garage)

Ch – church/religious structure

Sch – school

Rest – restaurant

L – lodging

Inst – institutional/municipal

Inds – industrial

Apt – apartments

WaHo – Warehouse

RR – railroad

UPRR – Union Pacific RR

RRtr – railroad tracks

Kitch – kitchen, (detatched/backyard – includes Ovens)

pkg – parking (structure)

Mod – Modern or Moderate (sensitivity)

(street name) – no actual street, block boundary follows alignment of projected street

D.2 - Paleontological Report

Technical Report

Paleontological Resource Assessment

Prepared For: Wilma Quan
City of Fresno

Copy To: Juergen Vespermann, Caltrans

Prepared by: FirstCarbon Solutions | Michael Brandman Associates

Date: September 5, 2013

The purpose of this memorandum is to review and evaluate potential short- and long-term impacts to buried paleontological resources that may result from construction and implementation of the proposed Fulton Mall Project.

Project Purpose and Need

The purpose of the proposed project is to improve parking and vehicle access to local businesses on Fulton Street in order to maximize sustainable development and economic productivity in conjunction with other downtown redevelopment projects. The proposed project is also intended to lower crime and improve safety for people walking between parking areas and businesses located on the Fulton Mall and for people who live in, work in, and visit the project area.

Proposed Project

The California Department of Transportation (Caltrans), as assigned by the Federal Highway Administration (FHWA), in cooperation with the City of Fresno (City) proposes to reconstruct Fulton Mall as a complete street by reintroducing vehicle traffic lanes to the existing pedestrian mall. The Mall consists of 6 linear blocks that were open to traffic prior to 1964 but now do not allow public vehicle access. The Mall is bounded by Tuolumne Street to the north and Inyo Street to the south, and includes portions of three cross streets. The total length of the new roadways would be 0.74 mile.

The “Mall” refers specifically to the pedestrian areas between adjoining buildings located on the former City streets of Fulton, Mariposa, Merced, and Kern, which function as an integrated pedestrian Mall. Fresno Street and Tulare Street, which do allow vehicle traffic, run through the Mall and divide it into three roughly equal sections. Mall landscaping elements include fountains, planters, benches, sculptures, electrical systems, irrigation systems, and two “tot lots.” The Mall does not include the adjoining buildings or their façades.

Each Build Alternative proposes to reconstruct the Mall using “complete streets” design concepts. Complete streets are those designed to function as shared public space, or as “living streets”—for pedestrians, cyclists, outdoor businesses, and slow-moving, cautiously driven vehicles. Complete streets may include narrow roadways, corner bulb-outs, winding streets, and other traffic calming measures to lower driving speeds; street trees and other landscape elements; wide pedestrian sidewalks and crosswalks; and bicycle accommodations such as dedicated bicycle lanes or wide shoulders. The purpose of incorporating these design concepts into the proposed project is to retain portions of the historic fabric

and character of the Mall, and maintain the key elements, feeling, and unique experience of a pedestrian mall in downtown Fresno.

The proposed project has three Alternatives, including two Build Alternatives and a No Build Alternative.

Alternative 1 consists of reopening the Mall with two-way streets, with one lane of vehicular traffic in each direction alongside bicycle, pedestrian, and potentially other travel modes. On-street vehicle parking spaces would be reintroduced along the length of the Mall (including cross streets), and construction of streetscape improvements would optimize the streets for the new blend of travel modes. One 11-foot vehicle travel lane would run in each direction, with a parallel parking lane of 9 feet included on both sides of the streets. A 20-foot sidewalk included on both sides of the streets would allow for walking and pedestrian-only seating, landscaping, lighting, and public art.

The existing 20 works of sculpture present on the Mall today would all remain, although some may be moved so as to be incorporated in sidewalk areas of the new streetscape. Only the 3 fountains found along the Kern Mall, west of Fulton, would remain. All of the planter beds and raised seating areas found along the Mall today would be removed in favor of wide sidewalks that incorporate artwork and seating areas. The two tot lots present, one located near the corner of Merced and Fulton, and the other located near the corner of Kern and Fulton, would be relocated and potentially combined into one larger tot lot on Kern Mall between Fulton Street and Home Run Alley, or near the corner of Mariposa and Fulton. Impacts to native earth during project construction are not anticipated.

Alternative 2 consists of reconnecting the street grid as in Alternative 1, but would include rebuilding distinctive elements of the Mall in five to six specific locations, known as “vignettes.” The vignettes would include many of the existing elements (sculptures, fountains, pavement pattern, trees, etc.). One 11-foot vehicle travel lane would run in each direction and would curve through the vignettes to avoid existing landscape features. Outside the vignette areas, the street would be straight, and the landscape would include a 9-foot parallel parking lane and pedestrian-only walking, seating, vegetation, and public art areas 20 feet wide on one or both sides of the street. Within the vignettes, the existing Mall landscape elements would be kept maximally intact. The remaining space on each side of the street would be dedicated to pedestrian travel, seating, vegetation, and artwork.

A total of 12 fountains—9 in vignettes and 3 on Kern Mall west of Fulton—would remain in place. The 12 fountains would be fully rebuilt or restored to working order. Fourteen of the 20 sculptures would remain in their current locations. The other 6 (along with the various tile mosaics benches on the Mall today) would be configured differently within the current right-of-way to accommodate the new streetscape. Street lighting outside the vignettes would be contemporary and pedestrian-oriented, but the original Mall fixtures would be rehabilitated within each vignette. The 2 tot lots present, 1 located near the corner of Merced and Fulton, and the other located near the corner of Kern and Fulton, would be relocated and potentially combined into one larger tot lot on Kern Mall between Fulton Street and Home Run Alley, or near the corner of Mariposa and Fulton. Impacts to native earth during project construction are not anticipated.

The third Alternative is the no-build Alternative. New streets would not be constructed and the Mall would remain as it now exists.

Environmental Setting

Topography

The Fulton Mall project study area consists predominantly of developed land consistent with the characteristics of an urban center. Single- and multi-story buildings are located throughout the project study area. Fulton Mall and the Cross Malls consist of paved pedestrian pathways. The project study area has generally flat topography at an elevation of approximately 290 feet above mean sea level.

Climate

The City of Fresno has an "inland Mediterranean" climate including long, hot, dry summers and short, foggy winters with low rainfall. The average winter temperatures are in the high 50s degrees Fahrenheit (°F); temperatures below freezing are unusual. Average summer temperatures are in the 90s°F; however, over the greater Fresno area the average is 95°F. Many summer days have highs exceeding 100°F. The City of Fresno experiences, on average, a little more than 10 inches annual precipitation.

Soils

The general soil profile within Fulton Mall study area consists of four separate soil series: Delhi loamy sand, Hanford sandy loam, Madera loam, and San Joaquin sandy loam. The soils within the majority of the study area have been altered from their natural state because of grading and compaction for the construction of the existing Fulton Mall and adjacent buildings and infrastructure. It is uncertain just how deep undisturbed terrain is located below the pavement of the existing Fulton Mall.

Paleontological Resource Assessment

Finger (2013) has previously reviewed the geology and paleontological sensitivity of the whole of the City of Fresno (see Attachment 1). The geologic maps of Matthews and Burnett (1965), Page and LeBlanc (1969), and Marchand and Allwardt (1978) indicate that the entire area of concern consists of Quaternary alluvium. Matthews and Burnett (1965) mapped the surface of the project area as Pleistocene nonmarine (Qc) and Quaternary nonmarine fan deposits (Qf), the former having been more recently been referred as the Riverbank Formation and the latter consists of undifferentiated Pleistocene-Holocene alluvial sediments, respectively.

Dr. Finger found that the University of California Museum of Paleontology (UCMP) database records three Pleistocene Riverbank Formation localities (#V4401, #V65100, and #V81121) in surrounding Fresno County, all of which yielded elements of the Rancholabrean (late Pleistocene) vertebrate fauna. Locality #V81121 is referred to the Riverbank Formation, whereas the other two units are unnamed. Locality #V4401 ("Tranquility") accounts for 149 of the 151 specimens listed. Numerous specimens have been have been published, several of which are types for their species. The recovered faunal assemblage includes pond turtle (*Clemmys marmorata*), rattlesnake (*Crotalus*), loon (*Gavia*), broad-footed mole (*Scapanus latimanus*), jackrabbit (*Lepus*), vole (*Microtus*), wood rat (*Neotoma*), pocket gopher (*Thomomys*), badger (*Taxidea*), grey fox (*Urocyon*), true fox (*Vulpes*), coyote (*Canis latrans*), horse (*Equus*), bison (*Bison*), elk (*Cervus*), and mule deer (*Odocoileus*). Among these are type specimens of *Clemmys marmorata*, *Scapanus latimanus*, and *Canis latrans* that have been documented in scientific publication. The UCMP database also records 12 plant localities in Fresno County, in the Pleistocene alluvial deposits of the Modesto, Riverbank, and Turlock Lake formations.

Dr. Finger indicated that all undisturbed Pleistocene alluvium in the surface and subsurface of the area has the potential to contain significant paleontological resources that could be impacted by project-related excavations. Fossils tend to be spottily distributed in alluvium, occurring primarily in pointbar and

floodplain deposits. Nevertheless, Dr. Finger concluded that all Pleistocene alluvium, including undifferentiated Pleistocene-Holocene fan deposits, should be considered as having a high paleontological sensitivity. Mitigation measures associated with potential impacts to buried paleontologic resources should be developed on a project-by-project basis.

Exhibit 1 shows that the whole of the Fulton Mall Reconstruction area is located on Quaternary nonmarine fan deposits (Qf), with Pleistocene nonmarine (Qc) located about ¼ mile to the southeast. Since the Quaternary nonmarine fan deposits overlie the Pleistocene nonmarine deposits at uncertain depth at the project site, it is not known -until cuts are made- at what depth the Pleistocene nonmarine deposits will be encountered.

Potential Project Impacts

Short-Term Construction Impacts

Construction of the proposed Fulton Mall project would require reconstruction activities that would disturb more than one acre and could include excavation cuts up to 15 feet below modern grade. During these activities, there is the potential that such excavation cuts below five feet could impact undisturbed Pleistocene and/or Quaternary deposits, and it is this undisturbed terrain that may contain locally significant fossil deposits. Grading activities that occur between modern grade and five feet below modern grade are expected to be disturbed given that Fulton Mall has undergone previous grading activities when the pedestrian mall and related utility improvements were constructed in the 1960s.

Long-Term Operational Impacts

Use of the conversion of Fulton Mall to a street network would not result in long-term impacts on paleontological resources because no long-term disturbance of undisturbed terrain would occur.

Mitigation Measures

Prior to the issuance of grading permits, a paleontologist shall be retained to monitor excavation activities that occur five feet below modern grade. If paleontological resources are found, earth-disturbing activities shall be diverted elsewhere until the monitor has completed salvaging of the resources. For resources that are discovered, the paleontologist shall prepare, identify, and curate any paleontological resources deemed significant. The significant resources shall be sent to a City-approved depository along with a summary report.

Kenneth L. Finger, Ph.D.
Consulting Paleontologist

18208 Judy St., Castro Valley, CA 94546-2306 510.885.1585 klfpaleo@comcast.net

September 4, 2013

Michael Dice
First Carbon Solutions
Michael Brandman Associates
220 Commerce, Suite 200
Irvine, CA 92602-1326

Re: Paleontological Records Search for the City of Fresno General Plan and Development Code Update, Fresno County, California (MBA Project #31680016)

Dear Michael:

As per your request, I have conducted a thorough search of the University of California Museum of Paleontology (UCMP) paleontology localities and specimens databases for the City of Fresno General Plan and Development Code Update project. The geologic maps of Matthews and Burnett (1965), Page and LeBlanc (1969), and Marchand and Allwardt (1978) indicate that the entire area of concern consists of Quaternary alluvium. Matthews and Burnett (1965) mapped the surface of the project area as Pleistocene nonmarine (Qc) and Quaternary nonmarine fan deposits (Qf), the former having been more recently been referred as the Riverbank Formation and the latter consists of undifferentiated Pleistocene-Holocene alluvial sediments, respectively.

The UCMP database records three Pleistocene localities (V4401, V65100, and V81121) in Fresno County that have yielded vertebrate fossils of the Rancholabrean (late Pleistocene) fauna. Locality V81121 is referred to the Riverbank Formation, whereas the other two units are unnamed. Locality V4401 ("Tranquility") accounts for 149 of the 151 specimens listed. Numerous specimens have been have been published, several of which are types for their species. The recovered faunal assemblage includes pond turtle (*Clemmys marmorata*), rattlesnake (*Crotalus*), loon (*Gavia*), broad-footed mole (*Scapanus latimanus*), jackrabbit (*Lepus*), vole (*Microtus*), wood rat (*Neotoma*), pocket gopher (*Thomomys*), badger (*Taxidea*), grey fox (*Urocyon*), true fox (*Vulpes*), coyote (*Canis latrans*), horse (*Equus*), bison (*Bison*), elk (*Cervus*), and mule deer (*Odocoileus*). Among these are type specimens of *Clemmys marmorata*, *Scapanus latimanus*, and *Canis latrans* that have been documented in scientific publication. The UCMP database also records 12 plant localities in Fresno County, in the Pleistocene alluvial deposits of the Modesto, Riverbank, and Turlock Lake formations.

All undisturbed Pleistocene alluvium in the surface and subsurface of the target area have the potential to contain significant paleontological resources that could be impacted by project-related excavations. Fossil tend to be spottily distributed in alluvium, occurring primarily in pointbar and

floodplain deposits. Nevertheless, all Pleistocene alluvium, including undifferentiated Pleistocene-Holocene fan deposits, should be considered as having a high paleontological sensitivity.

In accordance with CEQA guidelines, paleontological mitigation measures will be needed on all projects that involve excavations of previously undisturbed deposits. Pre-construction surveys by a professional paleontologist are recommended for those future project areas that include undisturbed terrain, especially where an alluvial section has been exposed by stream dissection. It would also be prudent to have a qualified cultural resources specialist onsite to monitor all project-related excavations. If any vertebrate fossils or potentially significant finds (e.g., numerous well-preserved invertebrate or plant fossils) are discovered by anyone working on a construction site, all activities in the immediate vicinity of the find are to cease until a qualified paleontologist evaluates the find for its scientific value. Paleontological resources deemed significant will be efficiently salvaged for deposition in an accredited and permanent scientific institution (e.g., UCMP) where they can be properly curated and preserved for the benefit of current and future generations.

If I can be of further assistance on this project, please do not hesitate to contact me.

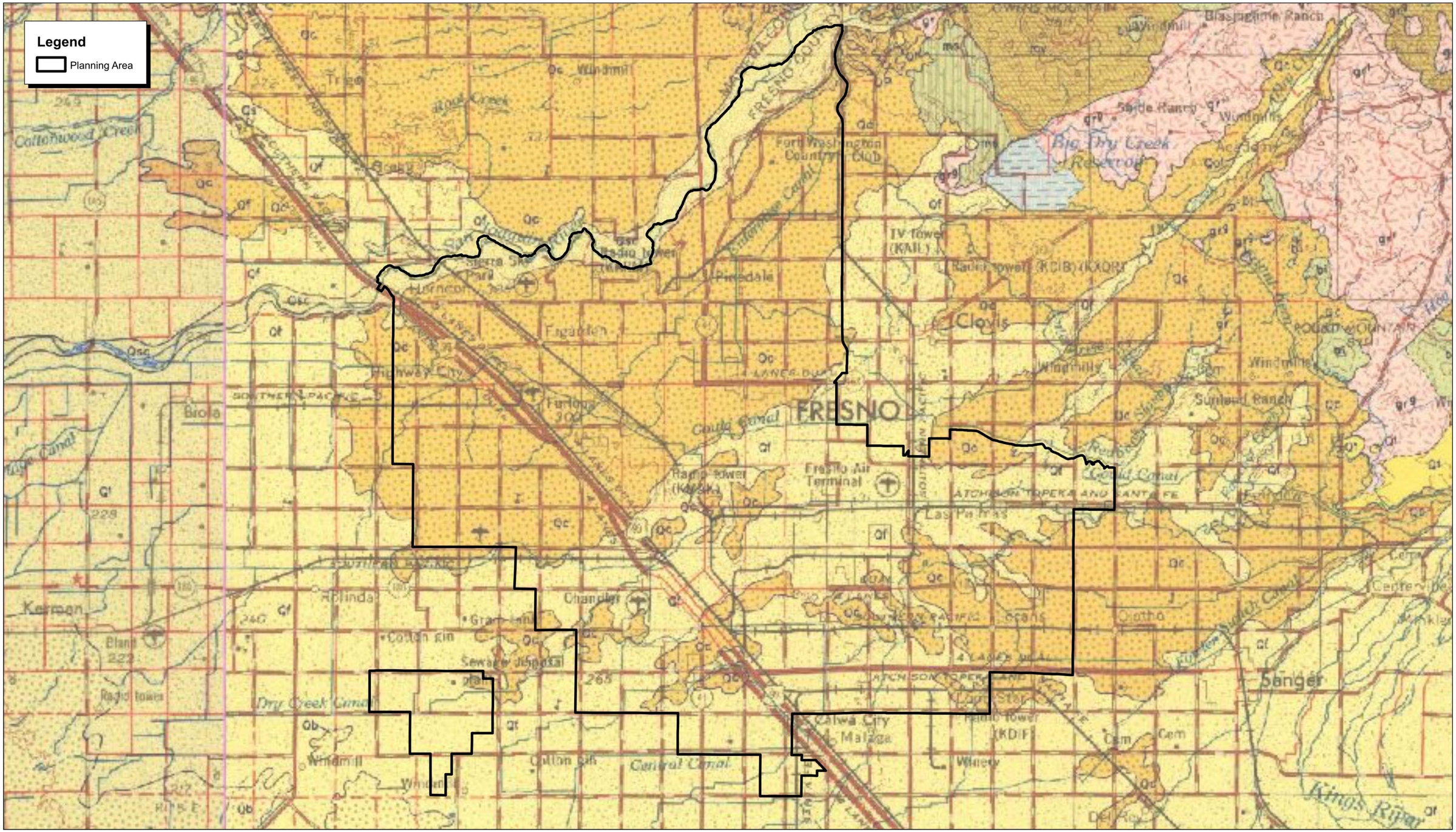
Sincerely,

References Cited

Marchand, D.E, and Allwardt, A., 1978, Preliminary geologic map showing Quaternary deposits of the northeastern San Joaquin Valley, California. U.S. Geological Survey, Miscellaneous Field Studies Map MF-945, scale 1:125,000.

Matthews, R.A., and Burnett, J.L., 1965, Geologic map of California, Fresno sheet. Olaf P. Jenkins edition. Scale 1:250,000. California Division of Mines and Geology. Sacramento, CA.

Page, R.W., and LeBlanc, R.A., 1969, Geology, Page, R.W. and LeBlanc, R.A., 1969, Geology, hydrology, and water quality in the Fresno area, California. U.S. Geological Survey, Open-File Report OF-69-328, scale 1:126720.



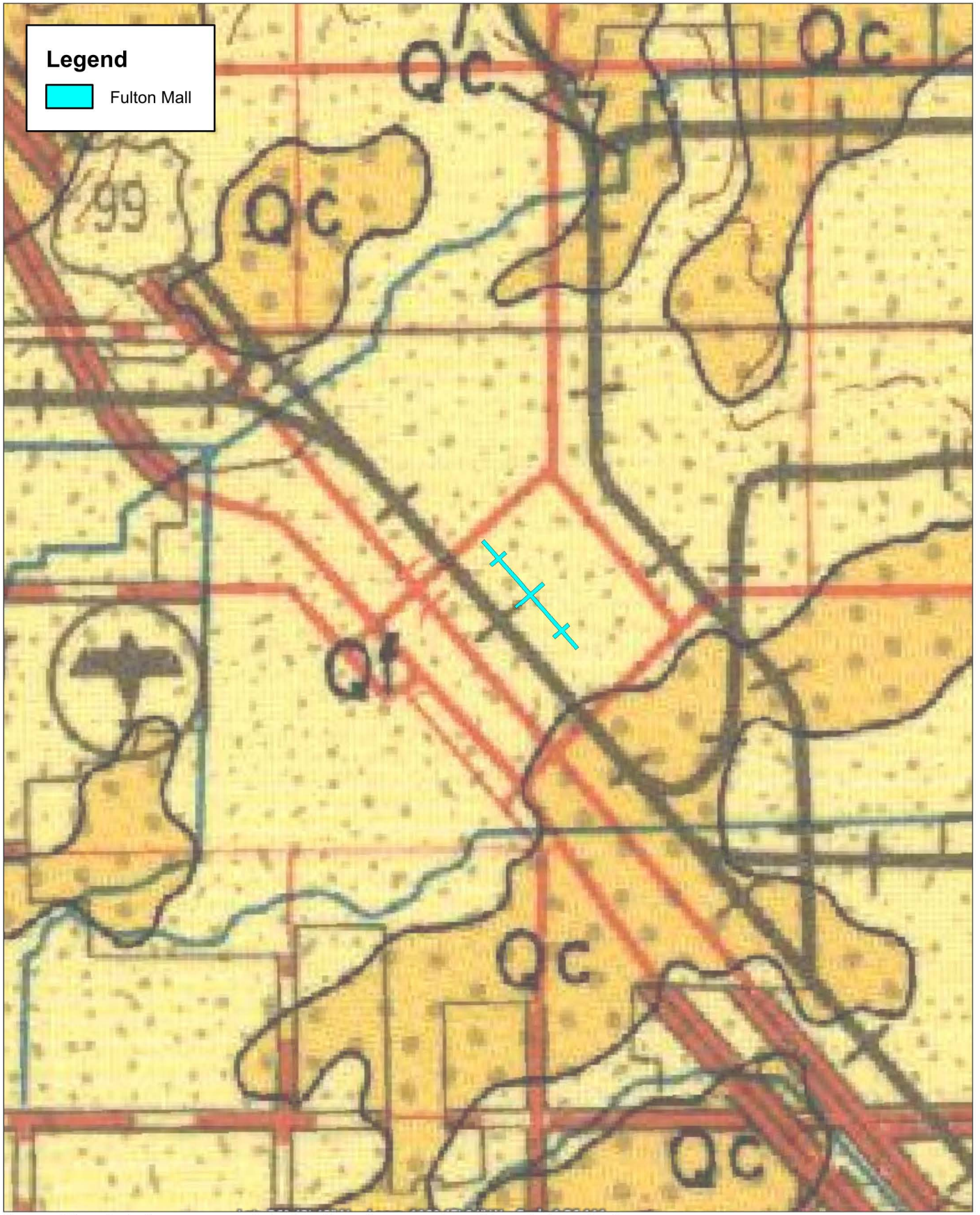
Source: US geological survey map website (http://ngmdb.usgs.gov/ngmdb/ngmdb_home.html)

NORTH

Michael Brandman Associates

31680016 • 09/2013 | paleo_map.cdr

City of Fresno Planning Area Geological Map



Source: US geological survey map website (http://ngmdb.usgs.gov/ngmdb/ngmdb_home.html)

Michael Brandman Associates

Geological Map of the Fulton Mall

31680017 • 09/2013 | paleo_map_fulton_mall.cdr

Appendix E:
Geologic Hazards Report

LIMITED GEOLOGIC HAZARDS SUMMARY
FULTON CORRIDOR SPECIFIC PLAN AREA
FRESNO, CALIFORNIA

PROJECT NO. 014-10022B
SEPTEMBER 21, 2011

Prepared for:

JUAN GOMEZ-NOVEY
MOULE & POLYZOIDES
180 EAST CALIFORNIA BOULEVARD AT PICHER ALLEY
PASADENA, CALIFORNIA 91105

Prepared by:

KRAZAN & ASSOCIATES, INC.
215 W. DAKOTA AVENUE
CLOVIS, CALIFORNIA 93612
(559) 348-2200

TABLE OF CONTENTS

1.0 INTRODUCTION 1
2.0 PURPOSE AND SCOPE 1
3.0 SITE LOCATION 1
4.0 GEOLOGIC SETTING 2
4.1 General 2
4.2 Structure and Faults 2
5.0 SITE DESCRIPTION 4
5.1 General/Surface Features 4
6.0 GEOLOGIC HAZARDS 4
6.1 Fault Rupture Hazard Zones in California 4
6.2 Seismic Hazard Zones in California 5
6.3 Historic Seismicity/Earthquake Epicenter Distribution 6
6.4 Geologic Subgrade 6
6.5 Soil Liquefaction 6
6.6 Seismic Settlement and Lateral Spread 7
6.7 Subsidence Due to Fluid Withdrawal 7
6.8 Expansive Soils 7
6.9 Tsunamis and Seiches 7
6.10 Slope Stability and Potential for Slope Failure 7
6.11 Volcanic Hazards 7
6.12 County Seismic Safety Element 8
7.0 CONCLUSIONS 8
8.0 LIMITATIONS 8

FIGURES

Vicinity Map ..... Figure 1
Site Topographic Map ..... Figure 2
Regional Geologic Map ..... Figure 3
Explanation for Regional Geologic Map ..... Figure 3.1
Regional Geologic Cross Section Showing the San Joaquin Valley ..... Figure 4
Regional Fault Map ..... Figure 5
Fault Map Explanation ..... Figure 5.1
Regional Earthquake Epicenter Map, M≥5 within 100 miles ..... Figure 6

TABLES

Seismic Sources ..... Table 1

APPENDICES

Earthquake Data File ..... Appendix A
References ..... Appendix B

September 21, 2011 Project No. 014-10022B

LIMITED GEOLOGIC HAZARDS SUMMARY
FULTON CORRIDOR SPECIFIC PLAN AREA
FRESNO, CALIFORNIA

1.0 INTRODUCTION

Krazan & Associates, Inc. (Krazan), has conducted this Limited Geologic Hazards Summary research for the referenced City of Fresno Fulton Corridor Specific Plan project subject site area (refer to Vicinity Map, Figure 1, and Topographic Site Map, Figure 2). Discussions regarding regional and site geologic/seismic conditions are presented herein, together with conclusions pertaining to potential geologic hazards. Based upon the geographical size of the Fulton Corridor Specific Plan project area and the relative consistency of geologic characteristics of the project areas, no soil sample collection and laboratory analysis were conducted in conjunction with this summary research and no site-specific geological investigations were conducted.

2.0 PURPOSE AND SCOPE

The information presented herein is intended to be utilized as a discussion of issues related to Geology/Soils in support of preparation of environmental review in conjunction with the referenced Specific Plan Area . The scope of work included the following:

- A site reconnaissance to observe the surface conditions at the Fulton Corridor Specific Plan subject site area.
- A review of geologic and seismologic literature pertinent to the area of the site.
- Evaluation of potential geologic hazards.
- Preparation of a summary of conditions, conclusions and recommendations.

3.0 SITE LOCATION

The Fulton Corridor Specific Plan project subject site area is located in Fresno County within the eastern portion of the San Joaquin Valley in California (refer to Vicinity Map, Figure 1).

- The Fulton Corridor area comprises approximately 400-567+/- acres encompassing approximately one square mile of land that focuses around the “Fulton Corridor” extending from Divisadero Street to the north, State Route (SR) 41 to the south, roughly M Street to the east, and the Union Pacific Railroad tracks or SR 99 to the west. The Fulton Corridor area is

surrounded by residential neighborhoods to the north, east, south and west, with areas of industrial and commercial development to the southeast and northwest.

The subject site is located in the northeast portion of USGS 7.5-minute Quadrangle Fresno South, dated 1963, photorevised 1981. A review of the Fresno South map indicates that surface elevations over the area of the subject site range from approximately 280 to 295 feet above mean sea level (Figure 2). A major surface watercourse identified as the San Joaquin River is located approximately 5.6 miles north of the northernmost point of the subject site.

4.0 GEOLOGIC SETTING

4.1 General

The Fulton Corridor Specific Plan subject site area is located along the east margin of the southern San Joaquin Valley portion of the Great Valley Geomorphic Province of California. The San Joaquin Valley is bordered to the north by the Sacramento Valley portion of the Great Valley, to the east by the Sierra Nevada, to the west by the Coast Ranges, and to the south by the Transverse Ranges. The San Joaquin sedimentary basin is separated from the Sacramento basin to the north by the buried Stockton arch and associated Stockton Fault. The 450-mile long Great Valley is an asymmetric structural trough that has been filled with a prism of Mesozoic and Cenozoic sediments up to 5 miles thick.

The Sierra Nevada, located east of the San Joaquin Valley, is gently southwesterly tilted fault block comprised of igneous and metamorphic rocks of pre-Tertiary age that comprise the basement beneath the San Joaquin Valley. The Coast Ranges, located west of the San Joaquin Valley, are comprised of folded and faulted sedimentary and metasedimentary rocks of Mesozoic and Cenozoic age.

The San Joaquin River and the Kings River are the principal rivers in the area. Alluvial fans formed by these rivers are the predominant geomorphic features in the Fresno area. The area of the subject site is characterized by low alluvial fans and plains, which constitute a belt of coalescing alluvial fans of low relief between the dissected uplands, adjacent to the Sierra Nevada and the valley trough. According to the map entitled "Geomorphic Features of the Fresno Area, San Joaquin Valley, California" (Page and Leblanc, 1969), the site is located in the "Compound Alluvial Fan of Intermittent Streams North of the Kings River Geomorphic Area." Recent alluvial fan deposits from streams emerging from highlands surrounding the Great Valley and Pleistocene non-marine sedimentary deposits (Riverbank Formation) composed of older alluvium and dissected fan deposits underlie the subject site area (See Regional Geologic Map, Figures 3 and 3.1, and Regional Geologic Cross-Section showing the San Joaquin Valley, Figure 4).

4.2 Structure and Faults

The general area of the subject site is underlain by a homoclinal series of Cenozoic deposits dipping 4 to 6 degrees to the southwest toward the center of the San Joaquin Valley. The contact between the Cenozoic and basement rocks dips nearly 8 degrees southwest, or at a slightly greater inclination than does the on-lapping homoclinal Cenozoic sequence.

The Sierra Nevada and Coast Ranges are geologically young mountain ranges that possess active and potentially active fault zones. Major active faults and fault zones occur at some distance to the east, west, and south of the project site (see the Regional Fault Map, Figure 5 and Fault Map Explanation, Figure 5.1). Table I is a listing of significant active faults within 100 miles of the subject site.

Numerous active faults are present within the central Coast Ranges west of the site including the San Andreas Fault (located approximately 65 miles west of the subject site). One of the nearest seismotectonic sources is the Great Valley Fault zone (Coast Ranges-Central Valley boundary zone), located approximately 40 miles west of the site. The Great Valley Fault zone is the geomorphic boundary of the Coast Ranges and the Central Valley and is underlain by a 300-mile long seismically active fold and thrust belt that has been the source of recent earthquakes, such as the 1983 magnitude 6.5 Coalinga and the 1985 magnitude 6.1 Kettleman Hills earthquakes. Nearly the entire thrust system is concealed or "blind." The basal detachment of this thrust system dips at a shallow angle to the west. East-directed thrusting over ramps in the detachment and west-directed thrusting on backthrusts are responsible for the uplift along the eastern range front of the Coast Ranges. Based on earthquake focal mechanisms, movement on the thrust zone is generally perpendicular to the strike of the geomorphic boundary and trend of the San Andreas Fault system. Shortening along the geomorphic boundary is driven by a component of the Pacific-North American Plate motion that is normal to the plate boundary. The Great Valley Fault zone is considered the dominant seismic feature with potential for affecting the subject site.

Regional structure within the Western Sierra Nevada north of the subject site is complex and generally consists of blocks separated by steeply eastward-dipping, north and northwest striking reverse faults of the Foothills Fault System. The Foothills Fault system is located approximately 40 miles north of the subject site. Based on mapping and historical seismicity, the seismicity of the Sierra Nevada foothills has been generally considered low by the scientific community. However, on August 1, 1975, a 5.7 Richter magnitude earthquake occurred near Oroville within the northern Sierra Nevada. Surface rupture along the Cleveland Hill Fault (part of the Foothills Fault System) was associated with 1975 Oroville earthquake. As a result of this event, numerous studies were undertaken to further evaluate the seismicity of the Sierra Nevada foothills. Of particular note are the geologic and seismicity studies conducted by Woodward-Clyde Consultants (WCC) to evaluate the proposed Auburn Dam site. Based on these studies, WCC concluded that seismic events in the Sierra Nevada foothills are associated with very small, geologically infrequent, incremental displacements having minor geomorphic surface expression.

In addition, the eastern border of the southern San Joaquin Valley is cut by a series of en-eschelon range-front faults. These faults are mainly northwest-trending normal faults, down dropped to the west and with a near vertical dip. One of the range-front faults, the Clovis Fault, is mapped approximately 13 miles northeast of the subject site. These range-front faults have generally been considered inactive; however, a September 1973 magnitude 4.4 earthquake that occurred approximately 4.3 miles north of the subject site may be related to this fault system.

The Sierra Nevada and Owens Valley Fault Zones bound the eastern edge of the Sierra Nevada block nearly 88 miles east of the site.

Tensional forces resulting in normal faults are reported to be related to crustal stress relief in the southeast portion of the San Joaquin Valley. Numerous relatively short, normal faults traverse this region. Creep activity is the prominent mode of slip on those faults in this region that are active. These movements have continued on an intermittent basis from the early Miocene to Recent time. This faulting is directly related to and controls the accumulation of oil in several oil fields within the easterly portion of the valley. Most authors agree that current creep movements can be ascribed to subsidence promoted by extensive withdrawal of petroleum, and in some cases, groundwater. Those faults considered to be active in the southern valley are Kern Front and Pond Faults located at least 90 miles south of the subject site.

White Wolf Fault (responsible for a 1952 earthquake that caused extensive damage in the Bakersfield area) is located in the tectonically active Tehachapi Mountains at the southerly terminus of the valley, over 100 miles south of the subject site.

5.0 SITE DESCRIPTION

5.1 General/Surface Features

Site reconnaissance was performed in July and August 2011 resulting in the following observations:

- The Fulton Corridor subject site area was observed to be virtually entirely developed land consistent with the characteristics of an urban center. Single and multi-story buildings were spread throughout the subject site. One-, two- and three-story buildings appear to be concentrated in the northern and western areas of the subject site, while much taller buildings of four to twenty-one stories (Fresno Pacific Towers/Security Bank Building) occupied the central area surrounding the Fulton Mall and vicinity. Areas not developed with structures generally contained paved streets, sidewalks, parking lots, parks, and landscaped areas.

No evidence of surface faulting was observed on the subject sites during our reconnaissance. The subject site and surrounding properties are relatively flat. No evidence of slope failures or instabilities was observed on the subject property or adjoining properties.

6.0 GEOLOGIC HAZARDS

6.1 Fault Rupture Hazard Zones in California

The Alquist-Priolo Geologic Hazards Zones Act went into affect in March, 1973. Since that time, the act has been amended 10 times (Hart, 1994). The purpose of the Act, as provided in DMG Special Publication 42 (SP 42), is to prohibit the location of most structures for human occupancy across the traces of active faults and to mitigate thereby the hazard of fault-rupture." The act was renamed the Alquist-Priolo Earthquake Fault Zoning Act in 1994, and at that time, the originally designated "Special Studies Zones" was renamed the "Earthquake Fault Zones."

As indicated by SP 42, "the State Geologist is required to delineate "earthquake fault zones" (EFZs) along known active faults in California. Cities and counties affected by the zones must regulate certain development 'projects' within the zones. They must withhold development permits for sites within the zones until geologic investigations demonstrate that the sites are not threatened by surface displacement from future faulting. The State Mining and Geology Board provide additional regulations (Policies and Criteria) to guide the cities and counties in their implementation of the law (CCR, Title 14, Division 2)."

Special Publication 42 also provides definitions of certain terms, which are important to the evaluation of seismic hazards. These include the definitions for a fault and a fault trace. They also include the following:

Active Fault: One which has had surface displacement within Holocene time (about the last 11,000 years), hence constituting a potential hazard to structures that might be located across it.

Potentially Active Fault: Initially, faults were defined as *potentially active*, and were zoned, if they showed evidence of surface displacement during Quaternary time (last 1.6 million years). The term "recently active" was not defined, as it was considered to be covered by the term "potentially active."...the term "potentially active" continued to be used as a descriptive term on map explanations on EFZ maps until 1988.

Sufficiently Active and Well-Defined: There are so many potentially active faults in the State that it would be meaningless to zone all of them. The State Geologist made a policy decision to zone only those potentially active faults that have a relatively high potential for ground rupture. To facilitate this, the terms "sufficiently active" and "well-defined," were defined for zoning faults other than the 4 named in the Act. These two terms constitute the present criteria used by the State Geologist in determining if a given fault should be zoned under the Alquist-Priolo Act.

Sufficiently active: A fault is deemed sufficiently active if there is evidence of Holocene surface displacement along one or more of its segments or branches. Holocene surface displacement may be directly observable or inferred.

Well-defined: A fault is considered well-defined if its trace is clearly detectable by a trained geologist as a physical feature at or just below the ground surface. The fault may be identified by direct observation or by indirect methods. The critical consideration is that the fault, or some part of it, can be located in the field with sufficient precision and confidence to indicate that the required site-specific investigations would meet with some success.

The Fulton Corridor Specific Plan subject site area does not lie on a Fault Rupture Hazard Zones Map, and accordingly, the site is not within a Fault-Rupture Hazard Zone. The nearest zoned fault is a portion of the Ortigalita Fault located approximately 61 miles west of the subject site.

6.2 Seismic Hazard Zones in California

In 1990, the California State Legislature passed the Seismic Hazard Mapping Act to protect public safety from the effects of strong shaking, liquefaction, landslides, or other ground failure, and other hazards caused by earthquakes. The Act is codified in the Public Resources Code as Division 2, Chapter 7.8, Sections 2690-2699.6 and became operative on April 1, 1991. The program and actions mandated by the Seismic Hazards Mapping Act closely resemble those of the Alquist-Priolo Earthquake Fault Hazards Zones Act (described above in Section 7.1). The Act requires that the State Geologist delineate various seismic hazards zones on Seismic Hazards Zones Maps. Specifically, the maps identify areas where soil liquefaction and earthquake-induced landslides are most likely to occur. The Act directs cities, counties, and state agencies to use the maps in their land use planning and permitting processes. A site-specific geotechnical evaluation is required prior to permitting most urban developments within the mapped zones. The Act also requires sellers of real property within the zones to disclose this fact to potential buyers.

Due to the relatively recent promulgation of the Act, a limited number of Seismic Hazard Zone Maps have been prepared as of this writing. Areas covered by the preliminary maps released to date include portions of the immediate San Francisco Bay area and several areas in Los Angeles, Orange, and Ventura Counties. The area of the subject site is not included on any of the maps released to date.

6.3 Historic Seismicity/Earthquake Epicenter Distribution

The Fresno area has historically experienced a low to moderate degree of seismicity. A listing of historic earthquakes with magnitudes greater than 4.0 within approximately 50 miles (80 kilometers) of the subject site was obtained from the comprehensive California Geological Survey computerized earthquake catalog for the State of California, the Townley and Allen (1939) catalog and the U.S. Geological Survey Earthquake Data Base System. In addition, a listing of historic earthquakes with magnitudes greater than 5.0 within approximately 100 miles of the subject site was obtained. The listings include the date, time, location, depth, magnitude, and intensity all recorded events within the search radius between 1800 and 2005. A review of the literature for pre-1900 earthquakes (Toppozada, 1991) does not reveal any significant recorded seismic events in the vicinity of the subject site prior to the period covered by the above noted listings.

The historic earthquake listings are included in Appendix A. A plot of epicenters associated with historic earthquakes in the region of the site with magnitudes greater than or equal to 5.0 is shown on Figure 6, Regional Earthquake Epicenter Map.

The earthquake data indicated that 88 events with magnitudes greater than 4.0 occurred within 50 miles of the subject site between 1800 and 2011. The data indicates that 134 events exceeded magnitudes 5.0 within 100 miles of the subject site. The nearest listed event occurred approximately 2.4 miles north of the site in 1864 with a magnitude of 4.3. The 1864 event may have occurred on a system of range-front faults which trend along the easterly margin of the San Joaquin Valley (described in Section 5.3 of this report). None of the listed earthquakes with magnitudes greater than 4.6 occurred within 24 miles of the site. Numerous earthquakes are listed with magnitudes between 5.0 and 6.0 beyond about 40 miles of the site. No events were recorded with magnitudes greater than 6.0 within 45 miles of the site.

The geologic literature indicates that groundshaking of VII intensity (Modified Mercalli Scale) was felt in Fresno from the 1872 Owens Valley Earthquake. This is the largest known earthquake event to have affected the Fresno area. The most recent earthquake significant to the Fresno area was the Coalinga seismic event which occurred on May 2, 1983 within the Coast Ranges-Sierran Block Boundary Seismotectonic structure. The Coalinga seismic event had a magnitude of M_w 6.5. The initial shock had a Modified Mercalli Intensity of V in the Fresno area. This earthquake and aftershocks had a substantial affect on Coalinga area but no damage, either architectural or structural, was reported in the area of the subject site.

6.4 Geologic Subgrade

Information obtained from the geologic literature indicates the general soil profile at the site consists predominately of silty sands, sandy silts and clayey sands. With the exception of a limited occurrence of near-surface loose soils, penetration resistance and laboratory testing indicate that these materials are at least medium dense. The Site Class per Table 1613.5.2 of the 2010 California Building Code is based upon the site soil conditions. It is our opinion that Site Class D is most consistent with the subject site soil conditions.

6.5 Soil Liquefaction

Soil liquefaction is a state of soil particles suspension caused by a complete loss of strength when the effective stress drops to zero. Liquefaction normally occurs in soils such as sand in which the strength is purely friction. However, liquefaction has occurred in soils other than clean sand. Liquefaction usually occurs under vibratory conditions such as those induced by seismic event.

To evaluate the liquefaction potential of a site, the following items are evaluated: 1) Groundwater depth; 2) Soil type; 3) Relative density; 4) Initial confining pressure; 5) Intensity and duration of groundshaking.

The soils anticipated to be encountered within a depth of approximately 50 feet on the subject site predominately consist of loose to very dense sandy silts, silty sands, sands, and sandy clayey silts. Moderate cohesion strength is associated with the clayey soils. Available groundwater depth mapping, as well as Krazan's experience in the area, indicates that historically groundwater has been located at depths on the order of 73 to 121 feet below site grade. Based on these findings, it appears that the potential for soil liquefaction within the project site is very low due to the type of soils anticipated to be within the upper layer, the relatively low levels of expected groundshaking at the site, and the lack of groundwater. Therefore, mitigation measures to mitigate seismic-induce liquefaction do not appear to be warranted.

6.6 Seismic Settlement and Lateral Spread

One of the most common phenomena during seismic shaking accompanying any earthquake is the induced settlement of loose unconsolidated soils. Based on the nature of the subsurface materials, the relatively level site conditions, and the relatively low to moderate seismicity of the region, it is not anticipated that seismic settlement or lateral spread would represent a significant geologic hazard to the site.

6.7 Subsidence Due to Fluid Withdrawal

Portions of the San Joaquin Valley have been subject to land subsidence due to fluid withdrawal (groundwater and petroleum). However, the area of the subject site is not known to be subject to such subsidence hazards.

6.8 Expansive Soils

The surface and near-surface soils observed on the site surface consist of sandy silts, silty sands, sandy silt or silty sand with trace clay, and sands. These materials are considered to have a very low to moderate expansion potential.

6.9 Tsunamis and Seiches

A tsunami is a series of ocean waves generated by an impulsive disturbance. Due to the inland location of the subject site, tsunamis are not considered a threat to the site. Seiches are standing waves in a body of water such as a lake or reservoir. Because such a body of water is not located near the site, seiches are not anticipated to affect the subject site.

6.10 Slope Stability and Potential for Slope Failure

Due to the generally flat-lying nature of the site and surrounding areas, problems from landslides are not anticipated to affect this site.

6.11 Volcanic Hazards

The subject site is not within an area known to be affected by volcanic hazards (Miller, 1989, USGS Bulletin, 1847).

6.12 County Seismic Safety Element

Documentation and mapping included in the Seismic Safety Element of the Fresno County General Plan, dated 2000 and Draft 2025 Fresno General Plan dated 2002 were reviewed. In addition, we reviewed the seismic safety supplement to the safety element (dated 1974) and the Draft Safety Element dated 2002. The seismic information contained within the Seismic Safety Element is somewhat dated and/or generalized and is superseded by more recent information and analyses described herein. The referenced documents generally indicate that the site area is subject to relatively low to moderate seismicity and related hazards.

7.0 CONCLUSIONS

Based upon our vicinity project history and review of available data, no evidence has been found that would indicate that a fault or other geologic hazard exists on the Fulton Corridor Specific Plan project subject site, which would represent the potential for a significant impact. Since the subject site area is underlain by deep alluvial basin, the area may be affected by strong seismic ground shaking; however, the seismicity of the region is considered relatively low to moderate. According to the 2025 Fresno General Plan Draft EIR, construction activities will require excavation and compaction of soils under the direction of a registered civil engineer or registered geologist. The Fresno metropolitan area is not prone to earthquakes or other geological hazards.

The City requires, as a standard building practice, the submittal of geotechnical reports. The design and construction of projects are required to comply with the recommendations of said reports. Therefore, it is recommended that a geotechnical investigation be conducted by the developer of any project within the Specific Plan subject site areas and submitted to the City for review and approval prior to issuance of site-specific building and grading permits. Conformance with the City's standard practice and procedures and the objectives and policies in the 2025 Fresno General Plan are mitigation measures which will reduce effects related to geology and geologic hazards to a level of less-than-significant. Provided that the proposed future developments conform to current design criteria and the recommendations of current and future Geotechnical Engineering Investigation(s), there appears to be no geologic reason to discourage the development and redevelopment of the subject site Specific Plan areas.

A list of references cited is provided in Appendix B.

8.0 LIMITATIONS

The above conclusions are based on conditions observed and geologic information available as of the date of this report. If future seismic occurrences show nearby fault activity other than that described above, if future events show geologic conditions differing from those indicated above, or if present state-of-the-art geologic information should change materially, then the conclusions of this report should be reviewed by a Certified Engineering Geologist, and the conclusions modified or approved in writing.

This report is applicable only to the subject site property as described herein, and should not be utilized for any other site.

If there are any questions or if we can be of further assistance, please do not hesitate to contact our office at (559) 348-2200.

Respectfully submitted,
KRAZAN & ASSOCIATES, INC.

Michael H. Bowery
Professional Geologist
PG No. 5027

Arthur C. Farkas
Registered Environmental Assessor
No. 07818

MHB/ACF/apl

REFERENCES AND BACKGROUND SOURCES
014-10022B

Association of Engineering Geologists, 2001, *Engineering Geology Practice in Northern California,* Special Publication 12 and California Geological Survey Bulletin 210.

Bartow, J.A., 1991, *The Cenozoic Evolution of the San Joaquin Valley, California,* U.S. Geological Survey Professional Paper 1501, 40p.

Bennett, J.H., and Sherbrune, R.W., editors, 1983, *The Coalinga, California Earthquakes*, Special Publication 66, California Division of Mines and Geology.

California Building Standards Commission, 2007, California Code of Regulations, Title, 24, *California Building Code, 2007 edition*, Whittier, California

California Geological Survey, Note 48, *Checklist for the Review of Engineering Geology and Seismology Reports for California Public Schools, Hospitals, and Essential Services Buildings*, October 2007.

California Division of Mines and Geology (CGS), 2008, *Guidelines for Evaluating and Mitigating Seismic Hazards in California, Special Publication 117,* 102p.

California Geological Survey, *California Fault Parameters*, Internet Site
http://www.consrv.ca.gov/dmg/shezp/fltindex.html

Cao, Tianquing, Bryant, William A., Rowshandel, B., Branum, David, and Wills, Christopher J., 2003, *The Revised 2002 California Probabilistic Seismic Hazards Maps*: California Geological Survey, CGS website, June 2003.

City of Fresno, Planning and Development Department, Advance Planning, 2002, *2025 Fresno General Plan, Chapter I: Safety*, February 1, 2002.

Eaton, J.P., 1986, *Tectonic Environment of the Vacaville/Winters Earthquake, and the Potential for Large Earthquake Along the Western Edge of the Sacramento Valley,* U.S. Geological Survey, Open-File Report 86-370.

Hart, E.W. and Bryant, W.A., Revised 1997, *Fault-Rupture Hazard Zones in California: Alquist-Priolo Earthquake Fault Zoning Act with Index to Earthquake Fault Zones Maps, with Supplements 1 and 2 added 1999,* California Division of Mines and Geology, Special Publication 42, 38p.

Federal Emergency Management Agency, 2008, *FIRM Flood Insurance Rate Map, Madera, Madera County, California, County and incorporated Areas,* Community Panel Number 06039C1160E, effective date: September 22, 2008.

REFERENCES AND BACKGROUND SOURCES (CONT.)
014-10022B

Fresno County General Plan, 2000. *Background Report, Chapter 9*: *Safety*, Adopted October 3, 2000.

Jennings, C.W. and Bryant, W.A., 2010, *Fault Activity Map of California*, California Geological Survey, California Geologic Data Map No. 6.

Hill, Mary. 2006. *Geology of the Sierra Nevada*, California Natural History Guides, University of CA Press.

Marchand, D.E., 1976, *Preliminary Geological Maps Showing Quaternary Deposits of the Madera Area (Madera 7.5 Minute Quadrangle) Eastern San Joaquin Valley, Madera and Fresno Counties, California*, scale 1:24,000.

Matthews, R.A. and Burnet, J.L., 1965, *Geologic Map of California – Fresno Sheet*, 1:250,000.

Miller, C. Dan, 1989. *Potential Hazards from Future Volcanic Eruptions in California*, USGS Bulletin 1947.

Page, R.W. 1986, *Geology of the Fresh Ground-Water Basin of the Central Valley, California*, U.S. Geological Survey Professional Paper 1404-C, 54p.

Rymer, M.J., and Ellsworth, W.L., editors, 1990, *The Coalinga, California, Earthquake of May 2, 1983*, U.S. Geological Survey Professional Paper 1487.

Southern California Earthquake Center, University of Southern California 1999, *Recommended Procedures for Implementation of DMG Special Publication 117 Guidelines for Analyzing and Mitigation Liquefaction in California.*

Tokimatsu, K., and Seed, H. Bolton, 1987, *Evaluation of Settlements in Sands Due to Earthquake Shaking*, ASCE Journal of Geotechnical Engineering, vol. 113, no. GT8, p. 861-878.

Toppozada, T., Branum, D., Peterson, M., Hallstrom, C. Cramer, C., Reichle, M., *2000 Epicenters of and Areas Damaged by M>5 California Earthquakes 1800-1999*, California Geological Survey, Map Sheet 49.

Toppozada, T.R., 1987. *The 1892 Vacaville-Winters Earthquake and 1983 Coalinga Earthquake*, California Geology, December 1987 Volume 40, No. 12.

Toppozada, T.R., Real, C.R., and Parke, D.L., 1991. *Preparation of Isoseismal Maps and Summaries of Reported Effects for Pre-1900 California Earthquakes*, California Division of Mines and Geology, Open-File Report 81-11.

REFERENCES AND BACKGROUND SOURCES (CONT.)
014-10022B

Townley, S. D., and M. W. Allen, 1939. Descriptive Catalog of Earthquakes of Pacific Coast of the United States, 1769-1928. *Bulletin of the Seismological Society of America* 29 (1), 1-297.

Unruh, J.R., and Moores, E.M., 1992, *Quaternary Blind Thrusting in the Southwestern Sacramento Valley:* Tectonics, Vol. 11.

Wagner, D.L., Bortugno, E.J., and McJunkin, R.D., 1990, *Geologic Map of the San Francisco – San Jose Quadrangle, California, Scale 1:250,000,* California Department of Conservation, Division of Mines and Geology, Regional Geologic Map Series.

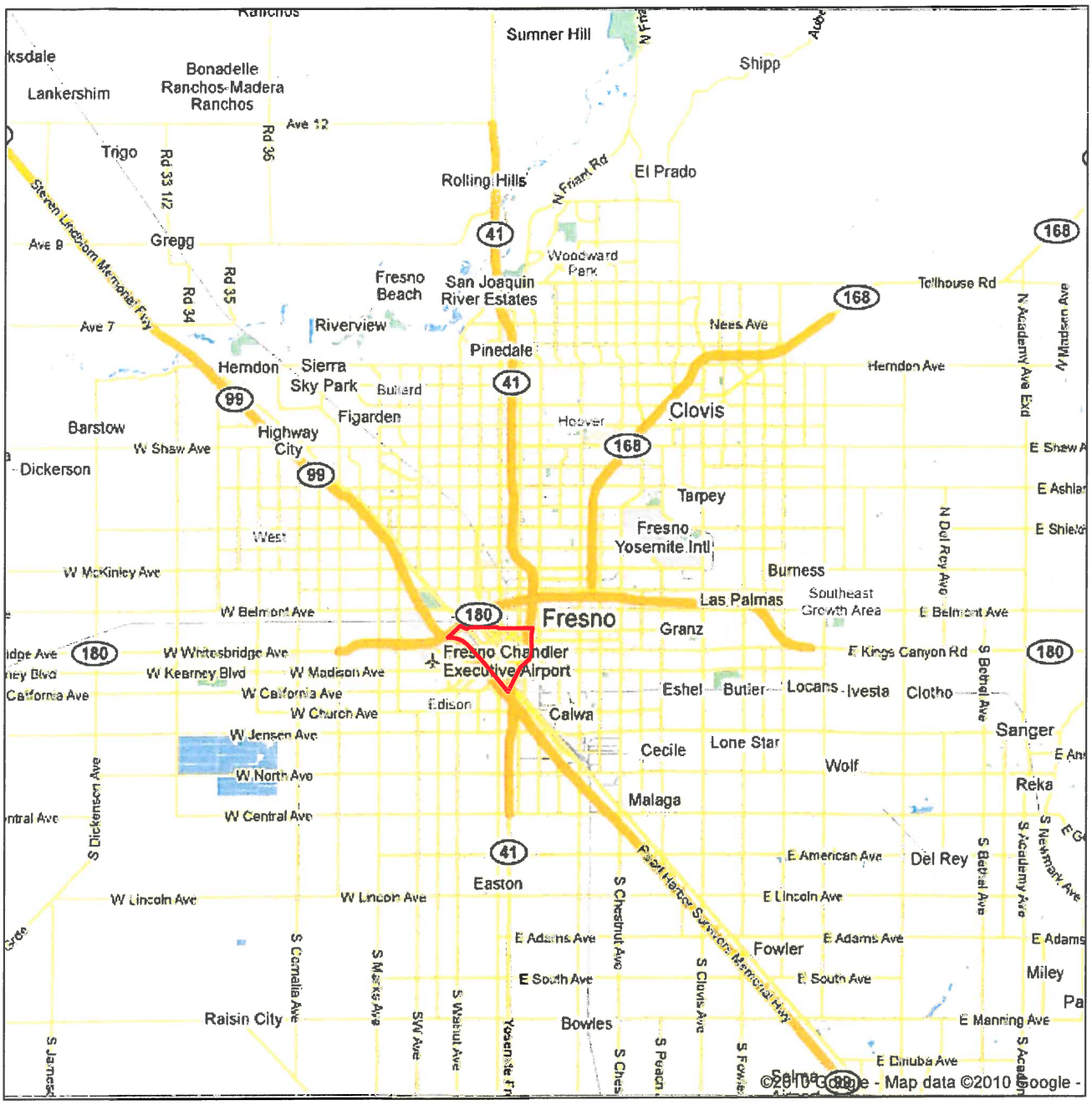
Youd, T. Leslie., Hansen, Corbett M., and Bartlett, Steven F., 2002, *Revised Multilinear Regression Equations for Prediction of Lateral Spread Displacement*, ASCE Journal of Geotechnical and Geoenvironmental Engineering, vol. 128, no. 12, December 2002 issue, p. 1007-1017.

Table I

SEISMIC SOURCES
FULTON CORRIDOR SPECIFIC PLAN AREA
FRESNO, CALIFORNIA

ABBREVIATED FAULT NAMES*	CLOSEST DISTANCE TO PROJECTION OF RUPTURE AREA ALONG FAULT (MILES)	MAXIMUM EARTHQUAKE MAG. (Mw)	EST. SITE INTENSITY MOD. MERC.
FOOTHILLS FAULT SYSTEM 1	40.0	6.5	VII
GREAT VALLEY 11	40.1	6.4	VII
GREAT VALLEY 12	40.1	6.3	VII
GREAT VALLEY 13	41.9	6.5	VII
FOOTHILLS FAULT SYSTEM 2	42.6	6.5	VII
GREAT VALLEY 14	46.2	6.4	VI
FOOTHILLS FAULT SYSTEM 3	46.6	6.5	VII
GREAT VALLEY 10	48.0	6.4	VII
GREAT VALLEY 9	53.4	6.6	VII
ORTIGALITA	61.3	7.1	VI
SAN ANDREAS (Creeping)	65.4	6.2	V
SAN ANDREAS - Parkfield	66.3	6.5	VI
GREAT VALLEY 8	70.8	6.6	VI
SAN ANDREAS - 1857 Rupture M-2a	73.6	7.8	VII
SAN ANDREAS - Cholame M-1c-1	73.6	7.3	VI
SAN ANDREAS - Cho-Moj M-1b-1	73.6	7.8	VII
SAN ANDREAS - Whole M-1a	73.6	8.0	VII
ROUND VALLEY	73.8	7.0	VI
HARTLEY SPRINGS	76.3	6.6	VI
HILTON CREEK	77.2	6.7	VI
SAN JUAN	78.2	7.1	VI
QUIEN SABE	78.9	6.4	V
BIRCH CREEK	80.2	6.4	VI
INDEPENDENCE	81.6	7.1	VI
FISH SLOUGH	84.6	6.6	VI
RINCONADA	86.6	7.5	V
OWENS VALLEY	87.7	7.6	VI
CALAVERAS (CS+CC)	89.2	6.4	V
CALAVERAS (CS+CC FLOATING)	89.2	6.2	V
CALAVERAS (FLOATING)	89.2	6.2	V
CALAVERAS (CS)	89.2	5.8	VI
CALAVERAS (CS+CC+CN)	89.2	6.9	VI
GREAT VALLEY 7	90.8	6.7	VI
MONO LAKE	91.1	6.6	VI
WHITE MOUNTAINS	91.6	7.4	VI
ZAYANTE-VERGELES	92.8	7.0	VI
SAN ANDREAS (SAS)	93.8	7.0	VI
SAN ANDREAS (SAS+SAP+SAN+SAO)	93.8	7.9	VII
SAN ANDREAS (SAS+SAP+SAN)	93.8	7.8	VII
SAN ANDREAS (SAS+SAP)	93.8	7.4	VI
SAN ANDREAS (FLOATING)	93.8	6.9	VI
WESTERN NEVADA ZONE 1	94.3	7.3	VI
CALAVERAS (CC)	94.6	6.2	V
CALAVERAS (CC+CN)	94.6	6.2	V
SAN ANDREAS - Carrizo M-1c-2	98.3	7.4	VI
MONTEREY BAY-TULARECITOS	99.4	7.3	VI
DEEP SPRINGS	99.5	6.6	VI
WESTERN NEVADA ZONE 2	99.9	7.3	VI

*These faults are used in seismic hazard analysis in accordance with the California Geological Survey.

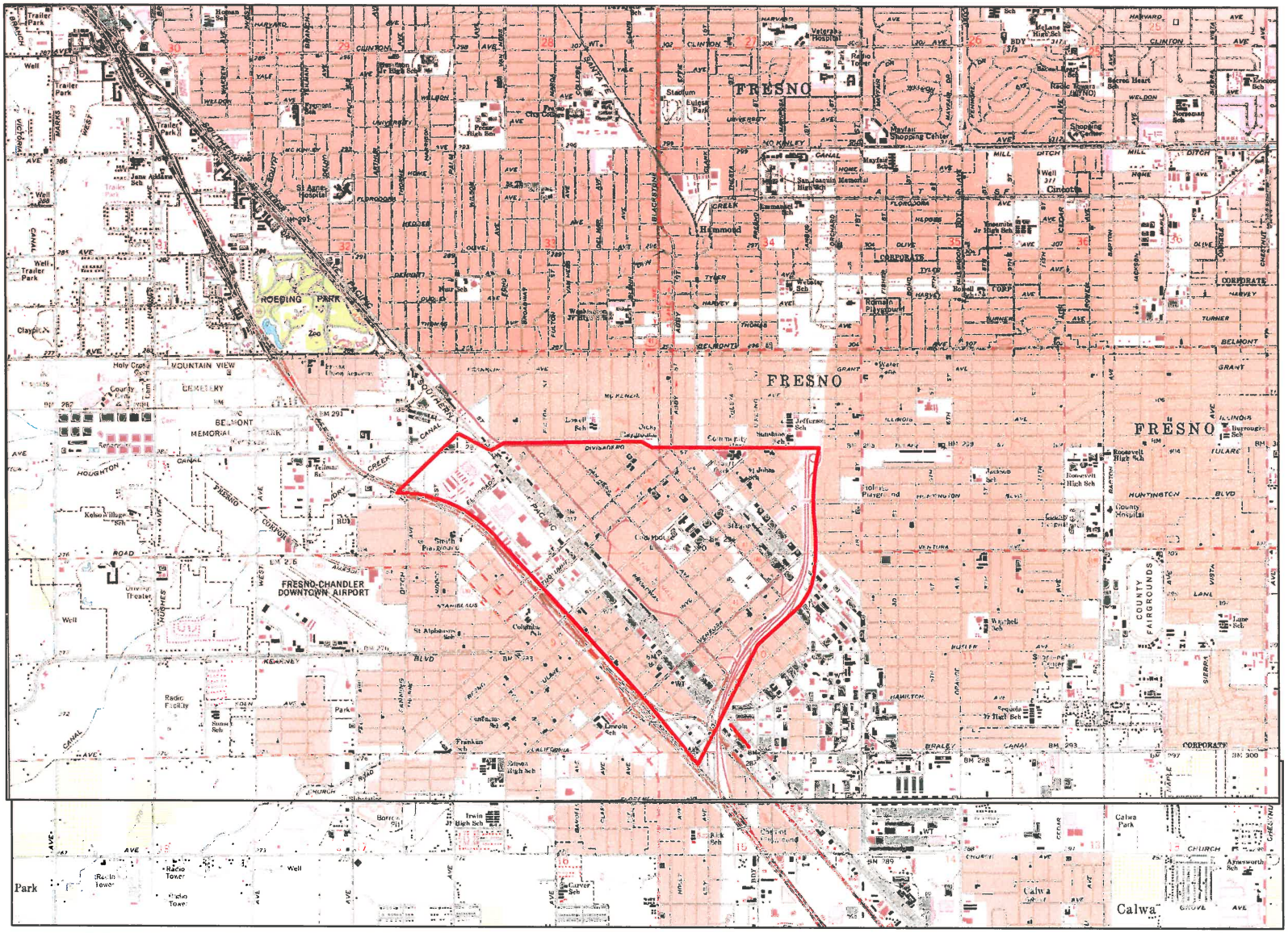


EXPLANATION

SUBJECT SITE BOUNDARY (APPROXIMATE)

*ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE

VICINITY MAP	Scale: NTS	Date: 8/11	Krazan SITE DEVELOPMENT ENGINEERS Conducting Assessments Nationwide
FULTON CORRIDOR SPECIFIC PLAN AREAS GEOLOGIC HAZARDS ANALYSIS	Drawn by: S. A.	Approved by: M. B.	
	Project No. 014-10022B	Figure No. 1	



MAP SOURCE: (4) USGS 7.5-minute Quadrangles as follows: Fresno North (dated 1965, photo revised 1981) Fresno South (dated 1963, photo revised 1981), Malaga (dated 1964, photo revised 1981) and Clovis (dated 1964, photo revised 1981).

EXPLANATION

SUBJECT SITE BOUNDARY (APPROXIMATE)

N

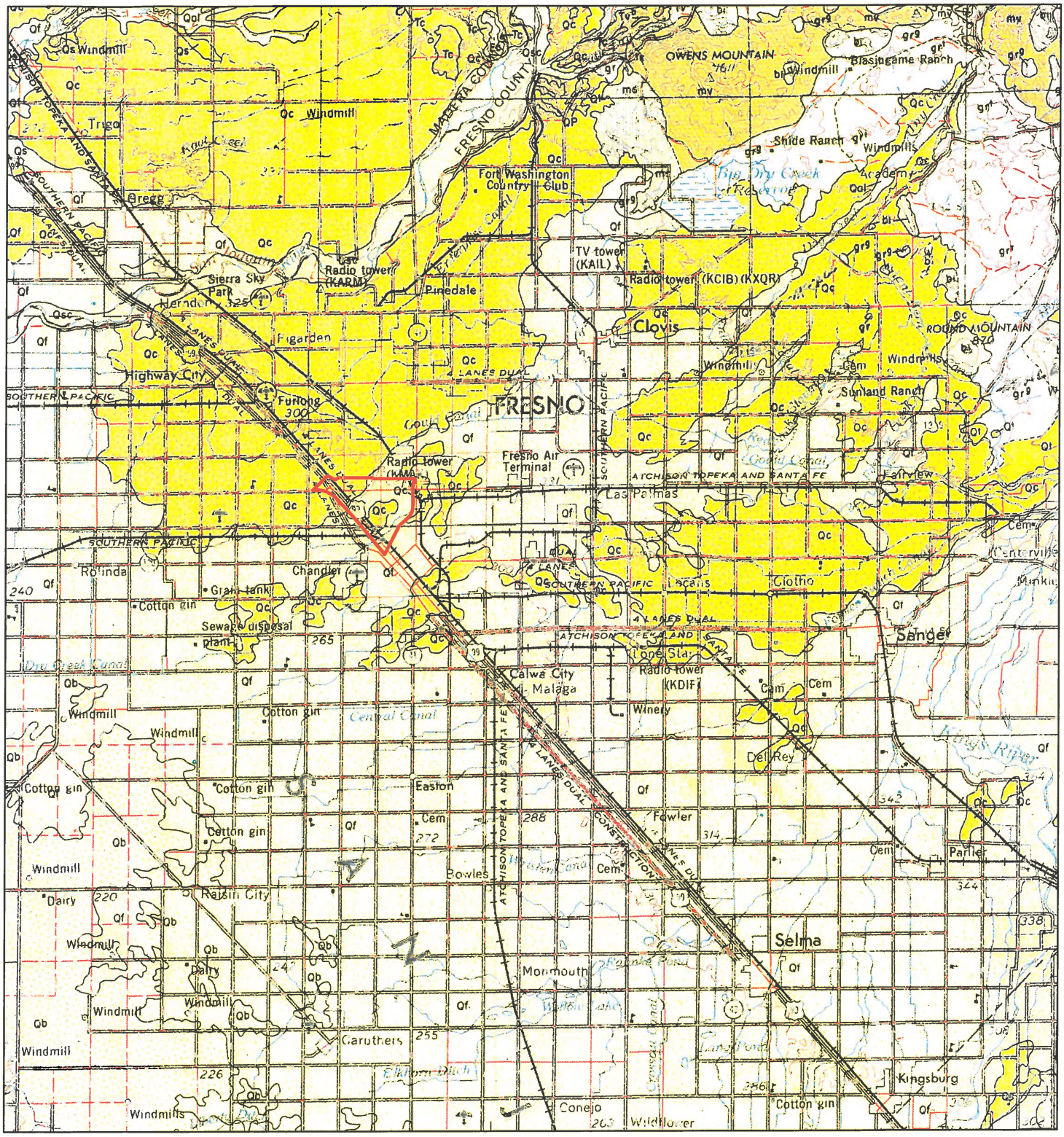
TOPOGRAPIC SITE MAP

FULTON CORRIDOR SPECIFIC PLAN AREAS
GEOLOGIC HAZARDS ANALYSIS

Scale: NTS	Date: 8/11
Drawn by: S. A.	Approved by: M. B.
Project No. 014-10022B	Figure No. 2

Krazan

SITE DEVELOPMENT ENGINEERS
Conducting Assessments Nationwide



EXPLANATION

SUBJECT SITE BOUNDARY (APPROXIMATE)

*MAP SOURCE:
GEOLOGIC MAP OF CALIFORNIA
OLAF P. JENKINS EDITION
FRESNO SHEET 1965

REGIONAL GEOLOGIC MAP	Scale: NTS	Date: 8/11	Krazan
FULTON CORRIDOR SPECIFIC PLAN AREAS GEOLOGIC HAZARDS ANALYSIS	Drawn by: S. A.	Approved by: M. B.	SITE DEVELOPMENT ENGINEERS Conducting Assessments Nationwide
	Project No. 014-10022B	Figure No. 3	

Qs RECENT DUNE SAND

Loose sand desposits very low in organic matter, northwest of Fresno and near Dinuba (Delhi soil series).

Qal RECENT ALLUVIUM

Stream alluvium including some dissected fans on the margins of the Great Valley. Corase granitic fanglomerate along the eastern front of the Sierra Nevada. Talus and slope wash. Alluvial fill in upland meadows. Recent calcareous tufa deposits in Kern Peak and Camp Nelson quadrangles.

Qsc RECENT RIVER AND MAJOR STREAM CHANNEL DEPOSITS IN THE GREAT VALLEY

Sediments along river channels and major streams including adjacent natural levees.

Qf RECENT ALLUVIAL FAN DEPOSITS IN THE GREAT VALLEY

Sediments deposits from streams emerging from highlands surrounding the Great Valley. Modesto Formation-*granitic sand and silt.*

Qb RECENT BASIN DEPOSITS IN THE GREAT VALLEY

Sediments deposited during flood stages of major streams in the area between natural stream levees and fans.

Qt QUATERNARY NONMARINE TERRACE DEPOSITS

Stream terraces of unconsolidated sand, silt , clay and gravel.

Qc PLEISTOCENE NONMARINE SEDIMENTARY DEPOSITS

Riverbank Formation-*granitic sand, silt and clay* . Older alluvium and dissected fan deposits in the San Joaquin Valley. So-called sand dune in Sand Meadows (southwest of Mineral King) composed of stream deposited sand, gravel, and cobbles.

Qp PLIOCENE-PLISTOCENE NONMARINE SIDIMENTARY DEPOSITS

Turlock Lake Formation-granitic sand, silt, clay, and cobbles.
Tulare Formation-continental beds of poorly consolidated sandstone, siltstone, and conglomerate.

Tc TERTIARY NONMARINE SEDIMENTARY ROCKS

Tuffaceous "sand and gravel" of Janda (Lanes Bridge and Friant quadrangles).

grg MESOZOIC GRANITIC ROCKS (GRANODIORITE)

Granodiorite, including hornblende biotite grandiorite. Tinemaha Granodiorite- *includes some quartz monzonite*; granodiorite in the Independence and Mount Pinchot quadrangles. Isabella Granodiorite-*ranging to quartz diorite* (Kern River Basin). Tokapah Porphyritic Granodiorite. Clover Creek Granodiorite, Cow Creek Granodiorite (Sequoia and Kings Canyon area). Lamarck Granodiorite (Mount Pinchot area).

grt MESOZOIC GRANITIC ROCKS (TONALITE) (QUARTZ DIORITE) AND DIORITE

Quartz diorite, pyroxene quartz diorite (near Academy). and hornblende diorite. Sacatar Quartz Diorite-*ranges from gabbro to grandiorite* (Kern River Basin). Potwisha Quartz Diorite (Sequoia area).

MESOZOIC BASIC INTRUSIVE ROCKS

Hornblende gabbro, pyroxene-hornblende gabbro, clinopyroxene anorthosite (Mount Pinchot quadrangle); and other mafic plutonic rocks including some diorite. Summit Gabbro-*hornblende gabbro* (Kern River Basin). Elk Creek Gabbro (Sequoia area). Olivine gabbro near Orosi.

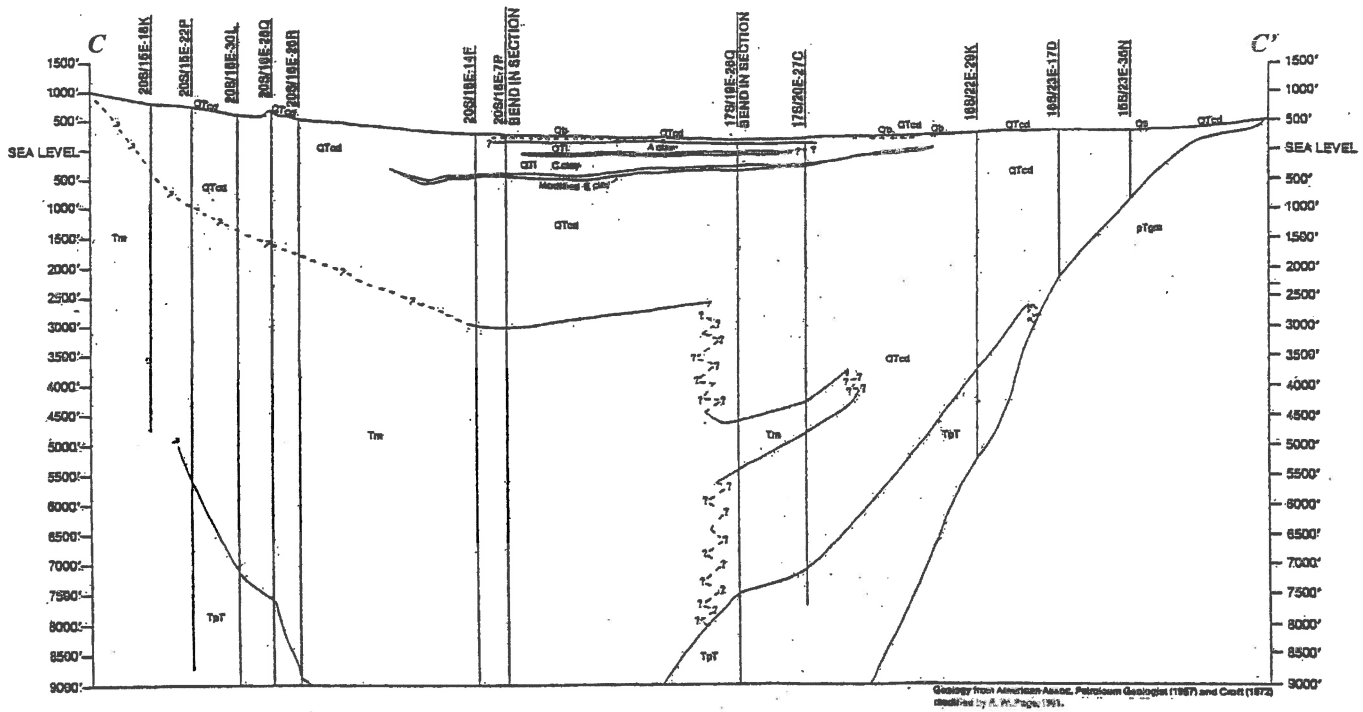
ms PRE-CRETACEOUS METASEDIMENTARY ROCKS

Unnamed metamorphic rocks composed predominantly of schist, metachert, phyllite, quarzite, hornfels, tactite slate, and marble .

mv PRE-CRETACEOUS METAVOLCANIC ROCKS

Unnamed amphibolite, mica schist, metarhyolite, and other metamorhposed tuffs and flows.

REGIONAL GEOLOGIC MAP EXPLANATION	Scale: AS SHOWN	Date: 8/11	Krazan
FULTON CORRIDOR SPECIFIC PLAN AREAS GEOLOGIC HAZARDS ANALYSIS	Drawn by: S. A.	Approved by: M. B.	SITE DEVELOPMENT ENGINEERS Conducting Assessments Nationwide
	Project No. 014-10022B	Figure No. 3.1	



EXPLANATION

Qs	*SAN DUNES (HOLOCENE) (HOLOCENE)*
Qb	*FLOOD BASIN DEPOSITS (HOLOCENE)*
QTl	*LACUSTRINE & MARSH DEPOSITS (PLIOCENE TO HOLOCENE)*
Qtcd	*CONTINENTAL ROCKS & DEPOSITS (OLIGOCENE TO HOLOCENE)*
Tm	*MARINE ROCKS & DEPOSITS (EOCENE, OLIGOCENE, MIOCENE, & PLIOCENE)*
TpT	*CONTINENTAL & MARINE ROCKS & DEPOSITS (PRE-TERTIARY TO OLIGOCENE)*
pTgm	*GRANITE & METAMORPHIC ROCKS (PRE-TERTIARY)*
~	*STRATIGRAPHIC UNIT CONTACT APPROXIMATELY LOCATED; QUERIED WHERE DATA ARE INCONCLUSIVE*

NOTE:

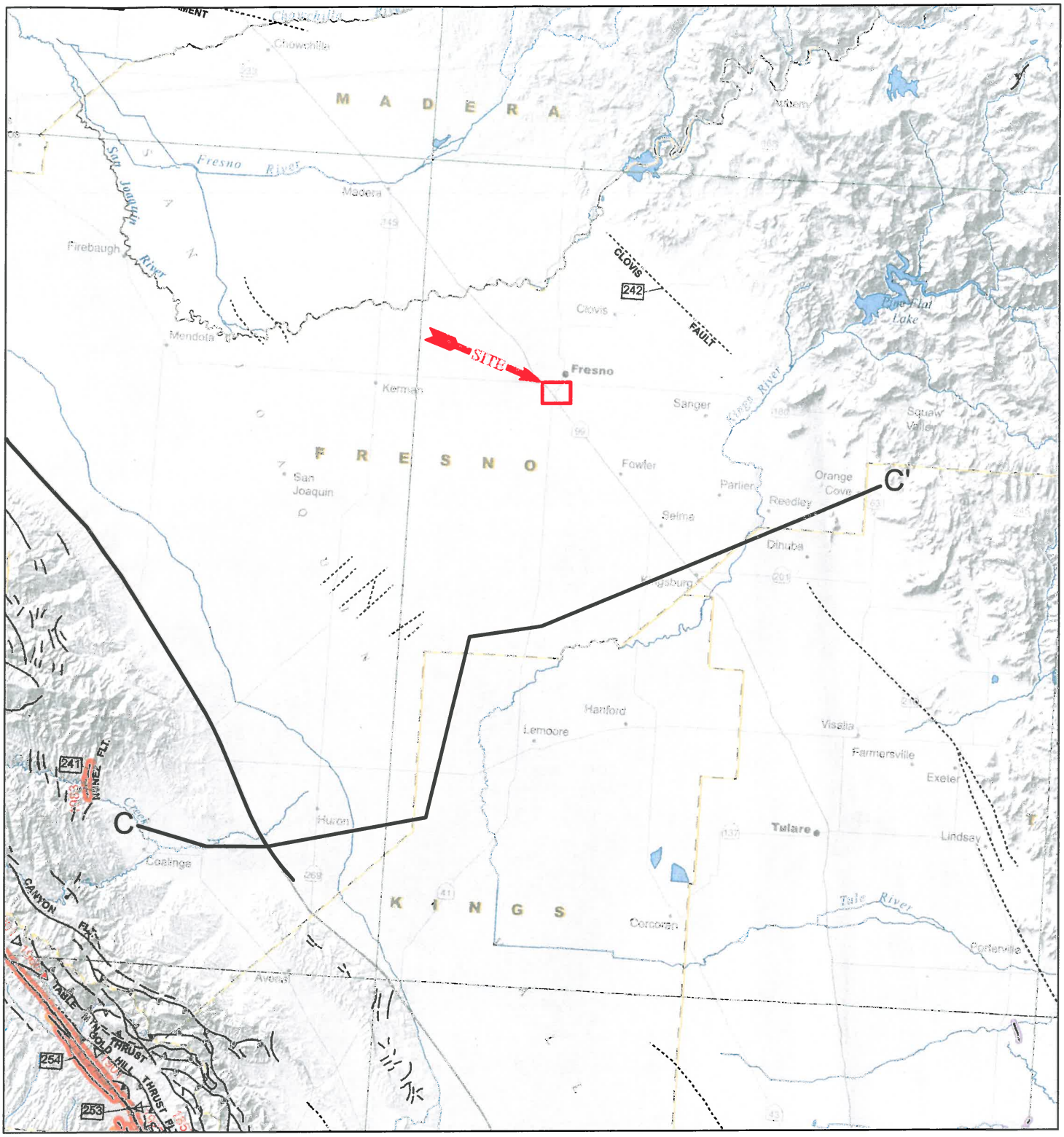
SEE FAULT MAP FOR LOCATION OF GEOLOGIC CROSS SECTION

REGIONAL GEOLOGIC CROSS-SECTION SHOWING THE SAN JOAQUIN VALLEY

(SEE FIGURE 5 FOR LINE OF CROSS-SECTION)

N

CROSS-SECTION	Scale: NTS	Date: 8/11	Krazan
FULTON CORRIDOR SPECIFIC PLAN AREAS GEOLOGIC HAZARDS ANALYSIS	Drawn by: S. A.	Approved by: M. B.	SITE DEVELOPMENT ENGINEERS Conducting Assessments Nationwide
	Project No. 014-10022B	Figure No. 4	



EXPLANATION

C——C' LINE OF REGIONAL GEOLOGIC CROSS SECTION

*MAP SOURCE:
C. G. S "FAULT ACTIVITY MAP OF CALIFORNIA
JENNINGS AND BRYANT, 2010

FAULT TRACES ON LAND ARE INDICATED BY SOLID LINES WHERE WELL LOCATED, BY DASHED LINES WHERE CONCEALED BY YOUNGER ROCKS OR BY LAKES OR BAYS, FAULT TRACES ARE QUERIED WHERE CONTINUATION OR EXISTENCE IS UNCERTAIN.

N

0 12 24

SCALE IN MILES(±)
*ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE

REGIONAL FAULT MAP	Scale: AS SHOWN	Date: 8/11	Krazan
FULTON CORRIDOR SPECIFIC PLAN AREAS GEOLOGIC HAZARDS ANALYSIS	Drawn by: S. A.	Approved by: M. B.	SITE DEVELOPMENT ENGINEERS Conducting Assessments Nationwide
	Project No. 014-10022B	Figure No. 5	

Fault along which historic (last 200 years) displacement has occurred and is associated with one or more of the following:

(a) a recorded earthquake with surface rupture. (Also included are some well-defined surface breaks caused by ground shaking during earthquakes, e.g. extensive ground breakage, not on the White Wolf fault, caused by the Arvin-Tehachapi earthquake of 1952). The date of the associated earthquake is indicated. Where repeated surface ruptures on the same fault have occurred, only the date of the latest movement may be indicated, especially if earlier reports are not well documented as to location of ground breaks.

(b) fault creep slippage - slow ground displacement usually without accompanying earthquakes.

(c) displaced survey lines.

A triangle to the right or left of the date indicates termination point of observed surface displacement. Solid red triangle indicates known location of rupture termination point. Open black triangle indicates uncertain or estimated location of rupture termination point.

Date bracketed by triangles indicates local fault break.

No triangle by date indicates an intermediate point along fault break.

Fault that exhibits fault creep slippage. Hachures indicate linear extent of fault creep. Annotation (creep with leader) indicates representative locations where fault creep has been observed and recorded.

Square on fault indicates where fault creep slippage has occured that has been triggered by an earthquake on some other fault. Date of causative earthquake indicated. Squares to right and left of date indicate terminal points between which triggered creep slippage has occurred (creep either continuous or intermittent between these end points).

Holocene fault displacement (during past 11,700 years) without historic record. Geomorphic evidence for Holocene faulting includes sag ponds, scarps showing little erosion, or the following features in Holocene age deposits: offset stream courses, linear scarps, shutter ridges, and triangular faceted spurs. Recency of faulting offshore is based on the interpreted age of the youngest strata displaced by faulting.

Late Quaternary fault displacement (during past 700,000 years). Geomorphic evidence similar to that described for Holocene faults except features are less distinct. Faulting may be younger, but lack of younger overlying deposits precludes more accurate age classification.

Quaternary fault (age undifferentiated). Most faults of this category show evidence of displacement sometime during the past 1.6 million years; possible exceptions are faults which displace rocks of undifferentiated Plio-Pleistocene age. Unnumbered Quaternary faults were based on Fault Map of California, 1975. See Bulletin 201, Appendix D for source data.

Pre-Quaternary fault (older that 1.6 million years) or fault without recognized Quaternary displacement. Some faults are shown in this category because the source of mapping used was of reconnaissnce nature, or was not done with the object of dating fault displacements. Faults in this category are not necessarily inactive.

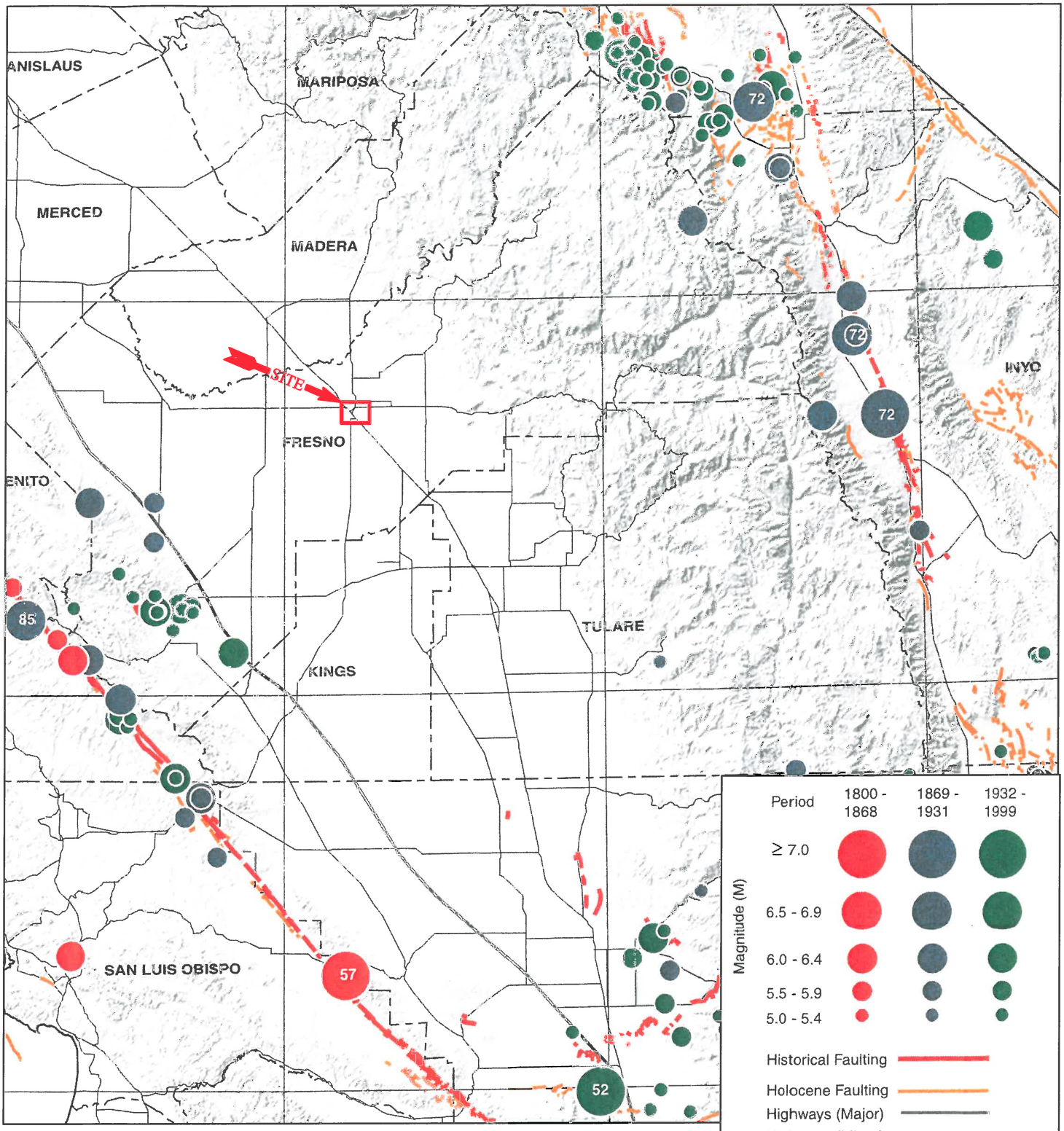
NOTES:

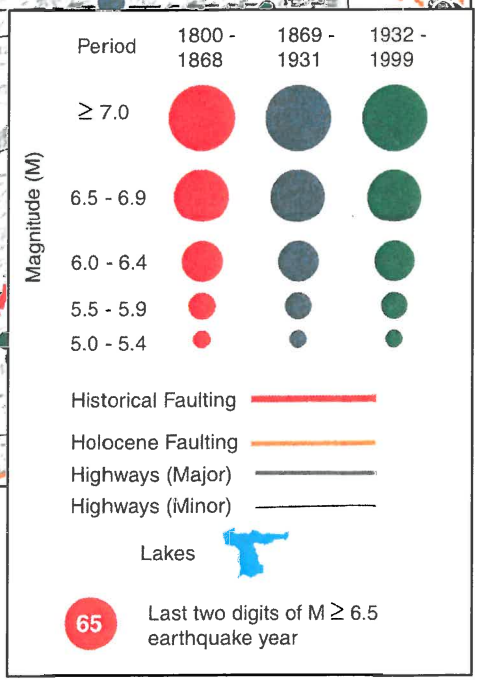
PREPARED FROM THE C.G.S. "FAULT ACTIVITY MAP OF CALIFORNIA" JENNINGS AND BRYANT, 2010

FAULT TRACES ON LAND ARE INDICATED BY SOLID LINES WHERE WELL LOCATED, BY DASHED LINES WHERE CONCEALED BY YOUNGER ROCKS OR BY LAKES OR BAYS. FAULT TRACES ARE QUERIED WHERE CONTINUATION OR EXISTENCE IS UNCERTAIN.

FAULT MAP
EXPLANATION

FAULT MAP EXPLANATION	Scale: AS SHOWN	Date: 8/11	Krazan SITE DEVELOPMENT ENGINEERS Conducting Assessments Nationwide
FULTON CORRIDOR SPECIFIC PLAN AREAS GEOLOGIC HAZARDS ANALYSIS	Drawn by: S. A.	Approved by: M. B.	
	Project No. 014-10022B	Figure No. 5.1	





*MAP SOURCE:
CGS MAP SHEET 49 EPICENTERS OF
AND AREAS DAMAGED BY M > 5 CALIFORNIA
EARTHQUAKES 1800-1989 BY TOPPOZADA, BRANUM, PETERSEN
HALLSTROM, CRAMER & REICHLE, 2000

0 40 80

SCALE IN KILOMETERS (±)
*ALL LOCATIONS AND DIMENSIONS
ARE APPROXIMATE

EPICENTER MAP LEGEND

REGIONAL EARTHQUAKE EPICENTER MAP	Scale: AS SHOWN	Date: 8/11	Krazan SITE DEVELOPMENT ENGINEERS Conducting Assessments Nationwide
FULTON CORRIDOR SPECIFIC PLAN AREAS GEOLOGIC HAZARDS ANALYSIS	Drawn by: S. A.	Approved by: M. B.	
	Project No.	Figure No. 6	

Appendix A

```
*************************
*                       *
*    E Q S E A R C H    *
*                       *
*     Version 3.00      *
*                       *
*************************
```

ESTIMATION OF
PEAK ACCELERATION FROM
CALIFORNIA EARTHQUAKE CATALOGS

JOB NUMBER: 01411022a

DATE: 08-30-2011

JOB NAME: 01411022a

EARTHQUAKE-CATALOG-FILE NAME: ALLQUAKE.DAT

MAGNITUDE RANGE:
MINIMUM MAGNITUDE: 4.00
MAXIMUM MAGNITUDE: 9.00

SITE COORDINATES:
SITE LATITUDE: 36.7359
SITE LONGITUDE: 119.7894

SEARCH DATES:
START DATE: 1800
END DATE: 2011

SEARCH RADIUS:
50.0 mi
80.5 km

ATTENUATION RELATION: 3) Boore et al. (1997) Horiz. - NEHRP D (250)
UNCERTAINTY (M=Median, S=Sigma): M Number of Sigmas: 0.0
ASSUMED SOURCE TYPE: DS [SS=Strike-slip, DS=Reverse-slip, BT=Blind-thrust]
SCOND: 0 Depth Source: A
Basement Depth: 5.00 km Campbell SSR: Campbell SHR:
COMPUTE PEAK HORIZONTAL ACCELERATION

MINIMUM DEPTH VALUE (km): 0.0

EARTHQUAKE SEARCH RESULTS

FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (UTC) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi [km]
T-A	36.7500	119.7500	08/16/1864	553 0.0	0.0	4.30	0.155	VIII	2.4(3.8)
MGI	37.0000	120.0700	09/12/1928	120 0.0	0.0	4.60	0.047	VI	23.9(38.5)
T-A	37.0000	119.5000	07/14/1894	450 0.0	0.0	4.30	0.039	V	24.2(39.0)
DMG	36.6020	119.3750	09/15/1973	1 315.4	8.0	4.40	0.041	V	24.7(39.8)
DMG	36.5830	120.3330	11/30/1963	225548.0	0.0	4.50	0.036	V	31.9(51.3)
BRK	36.4600	120.3400	08/03/1975	63516.0	0.0	4.90	0.040	V	36.0(57.9)
BRK	36.4600	120.3400	08/03/1975	638 0.0	0.0	4.40	0.031	V	36.0(57.9)
BRK	36.4700	120.3500	08/03/1975	55717.0	0.0	4.00	0.025	V	36.1(58.1)
BRK	36.5000	120.4000	08/15/1975	222751.0	0.0	4.60	0.033	V	37.5(60.4)
PAS	36.2200	120.1360	09/24/1980	8 839.1	6.7	4.40	0.028	V	40.5(65.1)
BRK	36.3000	120.3100	05/03/1983	93947.0	0.0	4.00	0.022	IV	41.7(67.1)
PAS	36.2600	120.2590	05/03/1983	142656.0	1.2	4.10	0.023	IV	41.9(67.5)
PAS	36.2050	120.1760	05/03/1983	0 022.1	9.0	4.00	0.022	IV	42.5(68.4)
BRK	36.1800	120.1200	08/12/1983	22 236.0	0.0	4.00	0.022	IV	42.5(68.5)
PAS	36.2500	120.2670	05/03/1983	01629.1	9.0	4.50	0.028	V	42.8(68.8)
PAS	36.1510	120.0490	08/04/1985	12 156.0	6.0	5.80	0.056	VI	42.9(69.0)
BRK	36.2500	120.2800	05/03/1983	018 1.0	0.0	4.40	0.027	V	43.2(69.5)
PAS	36.1450	120.0520	08/04/1985	112915.4	6.0	4.30	0.025	V	43.3(69.7)
PAS	36.1310	119.9970	08/05/1985	144538.3	6.0	4.30	0.025	V	43.3(69.7)
BRK	36.2500	120.2900	05/03/1983	154142.0	0.0	4.80	0.033	V	43.6(70.1)
BRK	36.2400	120.2800	05/03/1983	05034.0	0.0	4.00	0.021	IV	43.7(70.4)
PAS	36.2740	120.3310	02/19/1984	94310.6	7.4	4.40	0.026	V	43.8(70.5)
BRK	36.2800	120.3400	05/04/1983	161120.0	0.0	4.30	0.025	V	43.9(70.6)
USG	36.2300	120.2710	05/19/1983	11 530.1	12.9	4.16	0.023	IV	44.0(70.8)
BRK	36.2700	120.3300	05/03/1983	05745.0	0.0	4.80	0.032	V	44.0(70.8)
PAS	36.1190	119.9890	08/04/1985	12 841.8	6.0	4.10	0.022	IV	44.0(70.8)
USG	36.2380	120.2850	05/03/1983	21514.9	8.8	4.08	0.022	IV	44.0(70.9)
BRK	36.2400	120.2900	05/09/1983	24912.0	0.0	5.20	0.040	V	44.1(71.0)
PAS	36.1770	120.1750	05/03/1983	635 3.1	5.0	4.00	0.021	IV	44.1(71.0)
BRK	36.2200	120.2600	09/09/1983	91614.0	0.0	5.40	0.044	VI	44.2(71.1)
BRK	36.2500	120.3100	05/24/1983	9 219.0	0.0	4.60	0.029	V	44.3(71.2)
BRK	36.2300	120.2800	09/09/1983	92133.0	0.0	4.00	0.021	IV	44.3(71.3)
PAS	36.2190	120.2640	05/08/1984	192113.1	15.3	4.20	0.024	IV	44.4(71.4)
BRK	36.2600	120.3300	05/04/1983	72840.0	0.0	4.70	0.031	V	44.5(71.6)
BRK	36.2600	120.3300	05/03/1983	43233.0	0.0	4.30	0.025	V	44.5(71.6)
PAS	36.3130	120.3960	10/25/1982	231217.8	6.0	4.30	0.025	V	44.6(71.7)
BRK	36.2800	120.3600	05/05/1983	102045.0	0.0	4.60	0.029	V	44.6(71.8)
USG	36.2320	120.2990	05/03/1983	15546.4	6.9	4.00	0.021	IV	44.8(72.2)
UNR	37.3730	119.9560	08/10/1975	51640.5	5.5	4.40	0.026	V	44.9(72.3)
PAS	36.3210	120.4160	10/25/1982	231554.2	6.0	4.00	0.021	IV	45.0(72.5)
BRK	36.2200	120.2900	05/02/1983	234239.0	0.0	6.70	0.087	VII	45.2(72.7)
BRK	36.2200	120.2900	05/02/1983	2346 6.0	0.0	5.60	0.048	VI	45.2(72.7)
BRK	36.2200	120.3000	05/09/1983	32638.0	0.0	4.40	0.026	V	45.5(73.3)
DMG	36.2300	120.3200	08/13/1940	22 729.0	0.0	4.00	0.021	IV	45.7(73.5)
USG	36.2910	120.4010	08/12/1983	11441.1	9.8	4.04	0.021	IV	45.8(73.7)
BRK	36.2900	120.4100	08/14/1983	124337.0	0.0	4.20	0.023	IV	46.2(74.3)
USG	36.1800	120.2600	05/03/1983	13 914.6	12.5	4.04	0.021	IV	46.4(74.7)
GSB	36.3000	120.4270	04/21/1994	163715.3	10.0	4.50	0.027	V	46.4(74.7)
PAS	36.2860	120.4130	10/25/1982	2226 4.0	6.0	5.60	0.047	VI	46.5(74.8)
PAS	36.1820	120.2680	02/14/1987	72650.8	6.0	5.10	0.036	V	46.6(74.9)
DMG	36.2200	120.3300	10/22/1955	7 413.0	0.0	4.20	0.023	IV	46.6(75.0)
BRK	36.1400	120.1900	05/22/1983	83923.0	0.0	4.00	0.020	IV	46.8(75.3)
GSB	36.1920	120.2930	02/02/1997	022020.3	9.0	4.10	0.021	IV	46.8(75.3)

EARTHQUAKE SEARCH RESULTS

FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (UTC) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi [km]
T-A	36.1700	119.3200	07/25/1868	230 0.0	0.0	5.00	0.034	V	47.0(75.6)
USG	36.1800	120.2800	07/18/1983	1928 5.4	10.9	4.16	0.022	IV	47.1(75.7)
USG	36.1540	120.2320	05/02/1983	235529.1	8.6	4.24	0.023	IV	47.1(75.8)
BRK	36.2600	120.4000	07/09/1983	74052.0	0.0	5.30	0.040	V	47.2(76.0)
BRK	36.1400	120.2100	06/07/1983	51839.0	0.0	4.00	0.020	IV	47.3(76.1)
BRK	36.1300	120.1900	05/03/1983	14147.0	0.0	4.50	0.026	V	47.4(76.2)
USG	36.1340	120.2040	05/05/1983	43748.6	11.2	4.01	0.020	IV	47.5(76.5)
BRK	36.2500	120.4000	05/03/1983	6 447.0	0.0	4.30	0.023	IV	47.7(76.7)
GSP	36.1810	120.3010	03/31/1994	195959.7	10.0	4.40	0.025	V	47.7(76.8)
GSB	36.1720	120.2880	03/31/1994	200229.7	9.0	4.20	0.022	IV	47.8(76.9)
PAS	36.2400	120.3900	07/22/1983	24910.7	8.7	4.20	0.022	IV	47.8(76.9)
PAS	36.2400	120.3900	07/22/1983	24910.7	8.7	4.20	0.022	IV	47.8(76.9)
GSB	36.1740	120.2920	12/16/2006	061405.0	9.0	4.20	0.022	IV	47.8(76.9)
BRK	36.2100	120.3500	05/03/1983	03947.0	0.0	4.20	0.022	IV	47.8(77.0)
BRK	36.1500	120.2500	05/12/1983	1341 8.0	0.0	4.50	0.026	V	47.9(77.0)
BRK	36.1100	120.1600	01/14/1976	214359.0	0.0	4.90	0.032	V	47.9(77.0)
BRK	36.2300	120.3800	09/11/1983	1148 7.0	0.0	4.30	0.023	IV	47.9(77.1)
GSB	36.1630	120.2870	04/24/1984	045251.5	10.0	4.00	0.020	IV	48.2(77.6)
GSB	36.1580	120.2800	05/11/1985	085923.8	5.0	4.00	0.020	IV	48.3(77.7)
PAS	36.0520	119.9780	08/04/1985	151539.5	6.0	4.40	0.024	V	48.4(77.8)
PAS	36.1760	120.3220	01/03/1985	112228.0	7.8	4.30	0.023	IV	48.7(78.3)
BRK	36.3000	120.4800	08/26/1983	32118.0	0.0	4.00	0.020	IV	48.7(78.4)
BRK	36.2100	120.3800	07/25/1983	223140.0	0.0	5.10	0.035	V	48.9(78.7)
DMG	36.1700	120.3200	12/27/1926	919 0.0	0.0	5.00	0.033	V	48.9(78.7)
BRK	36.1000	120.1800	05/03/1983	01557.0	0.0	4.00	0.020	IV	49.0(78.8)
BRK	36.1000	120.1800	05/03/1983	01537.0	0.0	4.20	0.022	IV	49.0(78.8)
BRK	36.1300	120.2500	05/03/1983	855 3.0	0.0	4.50	0.025	V	49.0(78.9)
PAS	36.2450	120.4310	07/22/1983	329 2.3	3.0	4.10	0.021	IV	49.2(79.1)
PAS	36.2450	120.4310	07/22/1983	329 2.3	3.0	4.10	0.021	IV	49.2(79.1)
BRK	36.2200	120.4000	07/22/1983	23955.0	0.0	6.00	0.056	VI	49.2(79.1)
PAS	36.1760	120.3370	01/03/1985	104522.8	6.0	4.10	0.021	IV	49.2(79.1)
BRK	36.1400	120.2800	05/03/1983	0 924.0	0.0	4.00	0.019	IV	49.3(79.4)
DMG	37.0700	120.5800	11/01/1954	64240.0	0.0	4.00	0.019	IV	49.4(79.4)
DMG	36.3000	120.5000	11/30/1943	215718.0	0.0	4.00	0.019	IV	49.6(79.8)
GSG	36.0460	120.0420	01/28/2005	130326.3	10.0	4.00	0.019	IV	49.7(79.9)

****

-END OF SEARCH- 88 EARTHQUAKES FOUND WITHIN THE SPECIFIED SEARCH AREA.

TIME PERIOD OF SEARCH: 1800 TO 2011

LENGTH OF SEARCH TIME: 212 years

THE EARTHQUAKE CLOSEST TO THE SITE IS ABOUT 2.4 MILES (3.8 km) AWAY.

LARGEST EARTHQUAKE MAGNITUDE FOUND IN THE SEARCH RADIUS: 6.7

LARGEST EARTHQUAKE SITE ACCELERATION FROM THIS SEARCH: 0.155 g

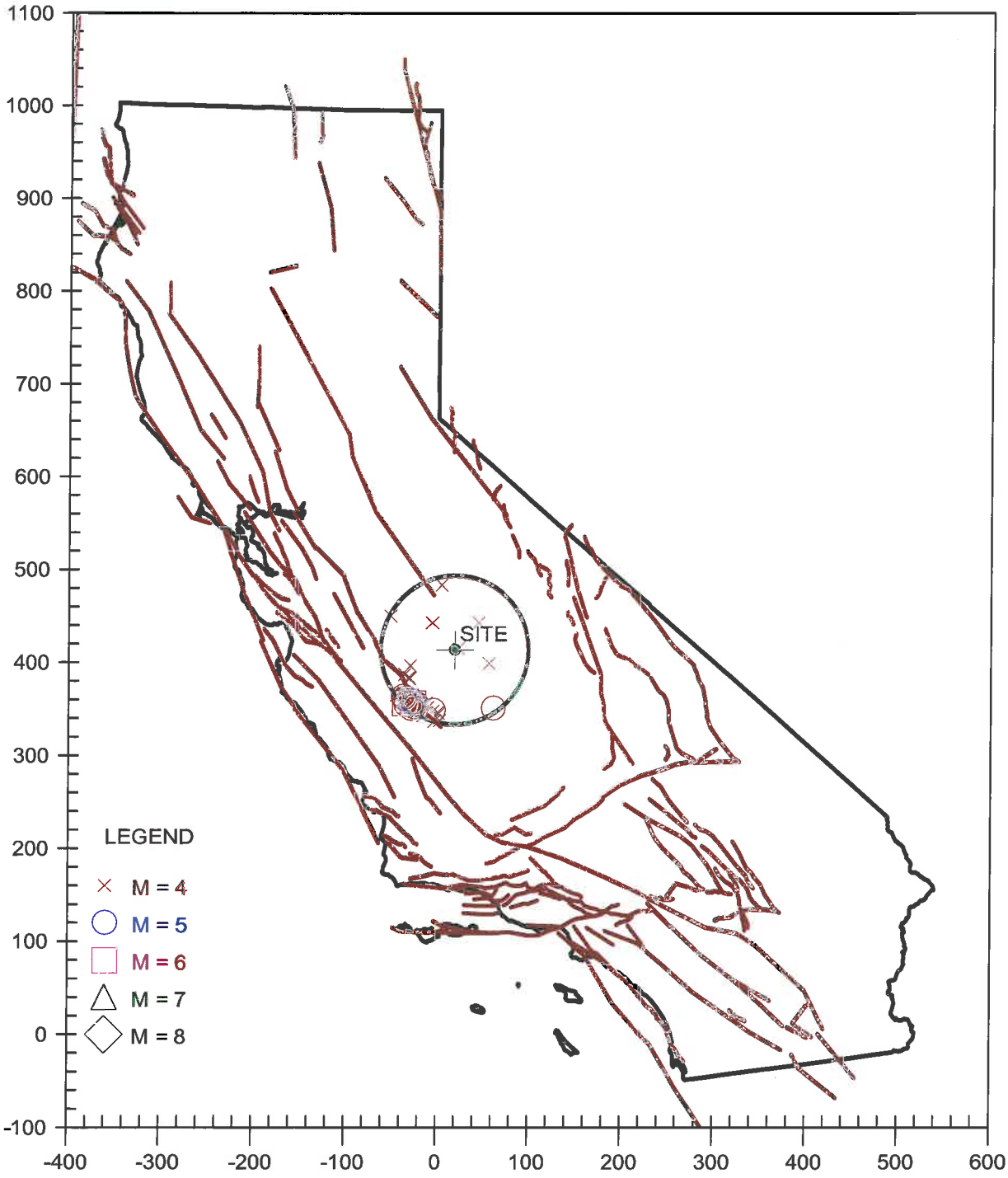
COEFFICIENTS FOR GUTENBERG & RICHTER RECURRENCE RELATION:
a-value= 2.784
b-value= 0.804
beta-value= 1.851

TABLE OF MAGNITUDES AND EXCEEDANCES:

Earthquake Magnitude	Number of Times Exceeded	Cumulative No. / Year
4.0	88	0.41706
4.5	27	0.12796
5.0	12	0.05687
5.5	5	0.02370
6.0	2	0.00948
6.5	1	0.00474

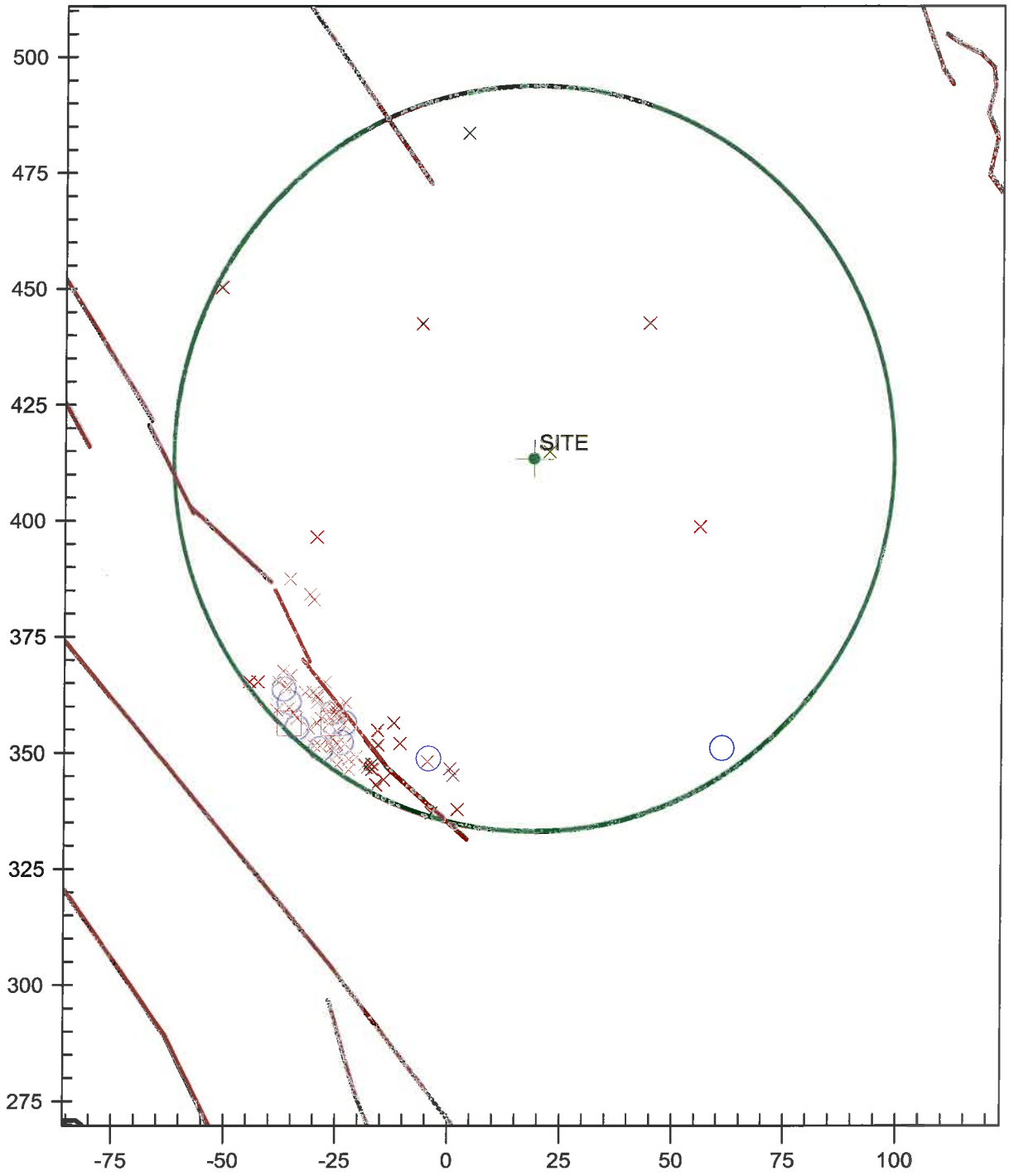
EARTHQUAKE EPICENTER MAP

01411022a



EARTHQUAKE EPICENTER MAP

01411022a



```
*************************
*                       *
*    E Q S E A R C H    *
*                       *
*     Version 3.00      *
*                       *
*************************
```

ESTIMATION OF
PEAK ACCELERATION FROM
CALIFORNIA EARTHQUAKE CATALOGS

JOB NUMBER: 01411022a

DATE: 08-30-2011

JOB NAME: 01411022a

EARTHQUAKE-CATALOG-FILE NAME: ALLQUAKE.DAT

MAGNITUDE RANGE:
MINIMUM MAGNITUDE: 5.00
MAXIMUM MAGNITUDE: 9.00

SITE COORDINATES:
SITE LATITUDE: 36.7359
SITE LONGITUDE: 119.7894

SEARCH DATES:
START DATE: 1800
END DATE: 2011

SEARCH RADIUS:
100.0 mi
160.9 km

ATTENUATION RELATION: 3) Boore et al. (1997) Horiz. - NEHRP D (250)
UNCERTAINTY (M=Median, S=Sigma): M Number of Sigmas: 0.0
ASSUMED SOURCE TYPE: DS [SS=Strike-slip, DS=Reverse-slip, BT=Blind-thrust]
SCOND: 0 Depth Source: A
Basement Depth: 5.00 km Campbell SSR: Campbell SHR:
COMPUTE PEAK HORIZONTAL ACCELERATION

MINIMUM DEPTH VALUE (km): 0.0

EARTHQUAKE SEARCH RESULTS

FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (UTC) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi [km]
PAS	36.1510	120.0490	08/04/1985	12 156.0	6.0	5.80	0.056	VI	42.9(69.0)
BRK	36.2400	120.2900	05/09/1983	24912.0	0.0	5.20	0.040	V	44.1(71.0)
BRK	36.2200	120.2600	09/09/1983	91614.0	0.0	5.40	0.044	VI	44.2(71.1)
BRK	36.2200	120.2900	05/02/1983	2346 6.0	0.0	5.60	0.048	VI	45.2(72.7)
BRK	36.2200	120.2900	05/02/1983	234239.0	0.0	6.70	0.087	VII	45.2(72.7)
PAS	36.2860	120.4130	10/25/1982	2226 4.0	6.0	5.60	0.047	VI	46.5(74.8)
PAS	36.1820	120.2680	02/14/1987	72650.8	6.0	5.10	0.036	V	46.6(74.9)
T-A	36.1700	119.3200	07/25/1868	230 0.0	0.0	5.00	0.034	V	47.0(75.6)
BRK	36.2600	120.4000	07/09/1983	74052.0	0.0	5.30	0.040	V	47.2(76.0)
BRK	36.2100	120.3800	07/25/1983	223140.0	0.0	5.10	0.035	V	48.9(78.7)
DMG	36.1700	120.3200	12/27/1926	919 0.0	0.0	5.00	0.033	V	48.9(78.7)
BRK	36.2200	120.4000	07/22/1983	23955.0	0.0	6.00	0.056	VI	49.2(79.1)
BRK	36.2000	120.4000	07/22/1983	343 2.0	0.0	5.00	0.033	V	50.2(80.8)
BRK	36.2500	120.4700	06/11/1983	3 954.0	0.0	5.10	0.034	V	50.5(81.3)
DMG	36.6000	120.8000	07/25/1926	175749.0	15.0	5.00	0.030	V	56.7(91.3)
DMG	36.2300	120.6500	02/05/1947	614 0.0	0.0	5.00	0.029	V	59.2(95.2)
DMG	36.0000	120.5000	02/02/1881	011 0.0	0.0	5.60	0.037	V	64.4(103.6)
DMG	36.0000	120.5000	03/03/1901	745 0.0	0.0	5.50	0.035	V	64.4(103.6)
DMG	35.9700	120.5000	06/28/1966	4 856.2	0.0	5.10	0.028	V	66.0(106.2)
DMG	35.9500	120.4700	11/16/1956	323 9.0	0.0	5.00	0.026	V	66.2(106.5)
GSB	35.9530	120.5020	09/29/2004	171004.0	11.0	5.10	0.027	V	67.0(107.9)
DMG	35.9500	120.5000	06/28/1966	42613.4	0.0	5.50	0.034	V	67.1(108.0)
PAS	37.5090	119.0430	06/11/1980	441 1.1	14.1	5.00	0.026	V	67.4(108.4)
DMG	35.9300	120.4800	12/24/1934	1626 0.0	0.0	5.00	0.026	V	67.6(108.8)
GSB	35.9170	120.4650	12/20/1994	102747.2	8.0	5.00	0.026	V	67.9(109.2)
DMG	37.2000	118.7000	09/30/1889	520 0.0	0.0	5.60	0.035	V	68.1(109.6)
DMG	35.9500	120.5300	06/29/1966	195325.9	0.0	5.00	0.026	V	68.1(109.6)
DMG	36.0800	118.8200	05/29/1915	646 0.0	0.0	5.00	0.025	V	70.4(113.2)
GSB	35.8190	120.3640	09/28/2004	171524.2	8.0	6.00	0.042	VI	70.9(114.1)
DMG	36.4000	121.0000	04/12/1885	4 5 0.0	0.0	6.20	0.047	VI	71.0(114.3)
DMG	35.8000	120.3300	12/28/1939	121538.0	0.0	5.00	0.025	V	71.3(114.7)
DMG	35.8000	120.3300	06/08/1934	430 0.0	0.0	5.00	0.025	V	71.3(114.7)
DMG	35.8000	120.3300	06/05/1934	2148 0.0	0.0	5.00	0.025	V	71.3(114.7)
DMG	35.8000	120.3300	06/08/1934	447 0.0	0.0	6.00	0.042	VI	71.3(114.7)
DMG	35.7500	120.2500	03/10/1922	112120.0	0.0	6.50	0.054	VI	72.7(117.1)
PAS	37.4640	118.8230	05/27/1980	145057.1	2.4	6.30	0.048	VI	73.2(117.8)
USG	37.4980	118.8380	06/06/1980	141817.2	2.0	5.27	0.028	V	74.2(119.5)
DMG	35.7500	120.3300	08/18/1922	512 0.0	0.0	5.00	0.024	V	74.4(119.8)
UNR	37.5580	118.9110	06/19/1980	71931.5	0.4	5.00	0.024	V	74.6(120.0)
USG	37.5420	118.8830	06/05/1980	20 452.3	1.6	5.05	0.025	V	74.7(120.3)
PAS	37.5540	118.8970	08/01/1980	163856.3	4.7	5.40	0.029	V	74.8(120.5)
UNR	37.5160	118.8370	06/18/1980	185537.7	6.3	5.30	0.028	V	75.2(121.0)
UNR	37.5360	118.8510	06/20/1980	152459.6	8.7	5.30	0.028	V	75.6(121.7)
PAS	37.4860	118.7830	05/25/1980	164930.3	4.7	5.80	0.036	V	75.8(122.1)
USG	37.5610	118.8740	08/01/1980	164745.9	1.9	5.15	0.026	V	76.0(122.4)
GSG	37.5290	118.8170	05/15/1999	132210.7	5.0	5.60	0.032	V	76.6(123.2)
PAS	37.6640	119.0080	01/07/1983	32419.1	5.0	5.60	0.032	V	77.2(124.2)
MGI	36.6000	118.4000	09/04/1868	0 0 0.0	0.0	5.00	0.023	IV	77.5(124.7)
DMG	37.4170	118.6670	02/02/1961	0 742.0	0.0	5.10	0.024	V	77.7(125.0)
DMG	36.5800	121.1800	07/29/1951	105345.0	0.0	5.00	0.023	IV	77.8(125.1)
DMG	37.5000	118.7500	09/18/1927	2 7 7.0	0.0	6.00	0.039	V	77.8(125.2)
GSB	36.6030	121.2010	04/23/1995	084136.6	7.0	5.00	0.023	IV	78.7(126.7)
USG	37.5270	118.7590	06/08/1980	61139.6	1.3	5.12	0.024	V	78.7(126.7)

EARTHQUAKE SEARCH RESULTS

FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (UTC) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi [km]
GSG	37.5640	118.8050	07/15/1998	045319.2	6.0	5.10	0.024	V	78.8(126.7)
DMG	36.9000	121.2000	03/06/1882	2145 0.0	0.0	5.70	0.033	V	78.8(126.8)
PAS	37.5560	118.7910	05/25/1980	194452.2	6.4	6.50	0.051	VI	78.9(127.0)
PAS	37.5170	118.7430	05/26/1980	122427.3	2.0	5.20	0.025	V	78.9(127.0)
PAS	37.6220	118.8810	09/30/1981	115327.0	6.0	5.80	0.035	V	79.0(127.1)
PAS	37.6560	118.9290	01/07/1983	13810.6	5.7	5.70	0.033	V	79.2(127.5)
DMG	37.5170	118.7330	06/05/1960	747 7.0	0.0	5.20	0.025	V	79.3(127.6)
DMG	36.5780	121.2090	02/24/1972	155651.0	7.5	5.10	0.024	V	79.4(127.7)
PAS	37.4490	118.6530	11/26/1984	162141.4	6.0	5.50	0.030	V	79.6(128.1)
DMG	37.3500	118.5500	08/04/1959	73659.0	0.0	5.20	0.025	V	80.4(129.4)
GSB	37.5890	118.7950	06/09/1998	052440.2	6.0	5.20	0.025	V	80.4(129.4)
PAS	37.6080	118.8210	05/25/1980	163344.8	3.7	6.40	0.047	VI	80.4(129.4)
PAS	37.4230	118.6080	11/23/1984	191235.3	6.0	5.40	0.028	V	80.5(129.6)
DMG	37.4500	118.6330	02/02/1961	0 416.0	0.0	5.30	0.026	V	80.5(129.6)
DMG	36.0000	120.9200	11/02/1955	1940 6.0	0.0	5.20	0.025	V	80.8(130.1)
UNR	37.6360	118.8470	06/19/1980	14430.2	8.3	5.20	0.025	V	80.9(130.2)
DMG	36.6700	121.2500	08/06/1916	1938 0.0	0.0	5.50	0.029	V	81.0(130.3)
T-A	36.6700	121.2500	04/01/1857	1135 0.0	0.0	5.00	0.022	IV	81.0(130.3)
PAS	37.5370	118.7130	05/25/1980	203551.0	5.0	5.50	0.029	V	81.0(130.4)
PAS	37.5140	118.6830	10/04/1978	164248.7	5.6	5.80	0.034	V	81.2(130.7)
DMG	37.5670	118.7330	09/14/1941	164331.8	0.0	5.80	0.034	V	81.7(131.4)
DMG	37.5670	118.7330	12/31/1941	64844.0	0.0	5.40	0.028	V	81.7(131.4)
DMG	37.5670	118.7330	09/14/1941	182118.7	0.0	5.50	0.029	V	81.7(131.4)
DMG	37.5670	118.7330	09/14/1941	2116 1.0	0.0	5.00	0.022	IV	81.7(131.4)
DMG	37.5670	118.7330	09/14/1941	183911.9	0.0	6.00	0.038	V	81.7(131.4)
DMG	37.4530	118.6040	12/03/1938	174252.6	10.0	5.70	0.032	V	81.9(131.8)
PAS	37.6040	118.7700	05/27/1980	19 1 8.3	3.8	5.00	0.022	IV	82.1(132.1)
GSB	36.8100	121.2750	01/26/1986	192051.2	7.0	5.50	0.029	V	82.3(132.5)
DMG	36.7000	118.3000	08/17/1896	1130 0.0	0.0	5.90	0.036	V	82.5(132.7)
PAS	37.5380	118.6750	10/04/1978	1739 3.3	6.3	5.30	0.026	V	82.6(133.0)
PAS	37.4700	118.5970	11/23/1984	18 825.6	6.0	6.20	0.042	V	82.9(133.5)
DMG	36.4500	121.2500	09/27/1938	1223 0.0	0.0	5.00	0.022	IV	83.3(134.1)
DMG	36.7000	121.3000	04/09/1961	72541.0	0.0	5.50	0.029	V	83.6(134.6)
DMG	36.7000	121.3000	03/31/1885	756 0.0	0.0	5.50	0.029	V	83.6(134.6)
DMG	36.6800	121.3000	04/09/1961	72316.0	0.0	5.60	0.030	V	83.7(134.7)
GSB	36.8030	121.3020	02/20/1988	083957.5	9.0	5.30	0.026	V	83.8(134.8)
DMG	36.0000	121.0000	02/26/1932	1658 0.0	0.0	5.00	0.022	IV	84.3(135.7)
PAS	37.4480	118.5450	03/25/1985	16 513.6	6.0	5.00	0.022	IV	84.3(135.7)
DMG	37.3300	118.4200	01/05/1912	354 0.0	0.0	5.50	0.028	V	85.9(138.2)
DMG	37.3300	118.4200	05/06/1910	1640 0.0	0.0	5.50	0.028	V	85.9(138.2)
DMG	37.5670	118.5830	12/28/1951	24927.0	0.0	5.20	0.023	IV	87.7(141.2)
DMG	37.5000	118.5000	04/11/1872	19 0 0.0	0.0	6.60	0.049	VI	88.4(142.3)
DMG	36.9000	118.2000	03/26/1872	14 6 0.0	0.0	6.50	0.046	VI	88.6(142.5)
DMG	36.9000	118.1900	11/28/1929	1949 0.0	0.0	5.50	0.027	V	89.1(143.4)
DMG	36.8000	121.4000	04/02/1885	1525 0.0	0.0	5.40	0.026	V	89.2(143.5)
DMG	37.0000	118.2000	04/03/1872	1215 0.0	0.0	6.10	0.037	V	89.7(144.3)
T-A	36.8300	118.1700	02/28/1895	825 0.0	0.0	5.00	0.021	IV	89.8(144.5)
T-A	36.8300	118.1700	07/12/1871	330 0.0	0.0	5.00	0.021	IV	89.8(144.5)
DMG	36.8300	121.4200	12/31/1910	1211 0.0	0.0	5.00	0.021	IV	90.4(145.5)
DMG	36.7800	121.4300	01/20/1960	32553.0	0.0	5.00	0.021	IV	90.8(146.1)
T-A	38.0000	120.2500	04/11/1872	12 0 0.0	0.0	5.00	0.021	IV	90.9(146.2)
MGI	37.0000	118.1700	12/02/1929	7 0 0.0	0.0	5.30	0.024	V	91.3(146.9)
MGI	37.0000	118.1700	12/08/1929	1245 0.0	0.0	5.30	0.024	V	91.3(146.9)

EARTHQUAKE SEARCH RESULTS

FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (UTC) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi [km]
DMG	36.8000	121.4500	06/24/1939	13 2 0.0	0.0	5.50	0.026	V	91.9(148.0)
PAS	37.5420	118.4440	07/21/1986	144226.7	6.0	5.90	0.033	V	92.6(149.1)
GSB	36.7550	121.4640	08/12/1998	141025.1	8.0	5.40	0.025	V	92.7(149.1)
PAS	37.4730	118.3720	07/31/1986	72240.5	6.0	5.90	0.032	V	93.2(149.9)
DMG	36.7000	118.1000	03/26/1872	1030 0.0	0.0	7.80	0.088	VII	93.5(150.5)
MGI	36.6000	118.1000	05/17/1872	21 0 0.0	0.0	5.00	0.020	IV	94.0(151.3)
PAS	37.5830	118.4500	07/20/1986	142946.3	6.0	5.90	0.032	V	94.1(151.4)
DMG	36.9100	121.4800	11/28/1974	23 124.7	0.0	5.20	0.022	IV	94.2(151.6)
GSB	37.0250	121.4580	01/16/1993	062934.9	5.0	5.30	0.023	IV	94.3(151.7)
DMG	36.8000	121.5000	11/13/1892	1245 0.0	0.0	5.60	0.027	V	94.7(152.4)
PAS	37.6470	118.5020	07/21/1986	22 718.7	6.0	5.40	0.025	V	94.7(152.4)
MGI	36.5800	118.0800	07/06/1917	11 1 0.0	0.0	5.70	0.029	V	95.3(153.3)
DMG	37.0200	121.4800	03/09/1949	122839.0	0.0	5.20	0.022	IV	95.4(153.5)
T-A	36.5800	118.0700	08/13/1882	0 0 0.0	0.0	5.00	0.020	IV	95.8(154.2)
T-A	36.5800	118.0700	04/18/1872	0 0 0.0	0.0	5.00	0.020	IV	95.8(154.2)
DMG	35.6000	118.8000	06/30/1926	1331 0.0	0.0	5.00	0.020	IV	95.9(154.3)
DMG	37.0000	121.5000	06/20/1897	2014 0.0	0.0	6.20	0.037	V	96.2(154.9)
MGI	35.5000	120.6000	01/01/1830	0 0 0.0	0.0	5.00	0.020	IV	96.6(155.4)
GSB	38.0470	119.1570	10/24/1990	061520.7	12.0	5.70	0.028	V	96.9(156.0)
BRK	37.1000	121.5000	08/06/1979	17 522.0	0.0	5.80	0.030	V	97.7(157.2)
PAS	37.6200	118.3980	07/22/1986	134859.0	6.0	5.20	0.022	IV	97.9(157.5)
DMG	37.5000	121.3000	07/15/1866	630 0.0	0.0	5.80	0.029	V	98.5(158.5)
T-A	36.8300	121.5700	10/18/1800	0 0 0.0	0.0	7.00	0.055	VI	98.7(158.8)
PAS	37.6270	118.3860	07/22/1986	133358.9	6.0	5.00	0.019	IV	98.7(158.9)
DMG	37.6100	118.3680	05/10/1936	174013.2	10.0	5.00	0.019	IV	98.8(159.0)
DMG	35.3000	119.8000	01/09/1857	16 0 0.0	0.0	7.90	0.089	VII	99.1(159.5)
DMG	37.2000	121.5000	07/06/1899	2010 0.0	0.0	5.80	0.029	V	99.7(160.4)
DMG	37.4000	121.4000	04/10/1881	10 0 0.0	0.0	5.90	0.031	V	99.9(160.7)

****

-END OF SEARCH- 134 EARTHQUAKES FOUND WITHIN THE SPECIFIED SEARCH AREA.

TIME PERIOD OF SEARCH: 1800 TO 2011

LENGTH OF SEARCH TIME: 212 years

THE EARTHQUAKE CLOSEST TO THE SITE IS ABOUT 42.9 MILES (69.0 km) AWAY.

LARGEST EARTHQUAKE MAGNITUDE FOUND IN THE SEARCH RADIUS: 7.9

LARGEST EARTHQUAKE SITE ACCELERATION FROM THIS SEARCH: 0.089 g

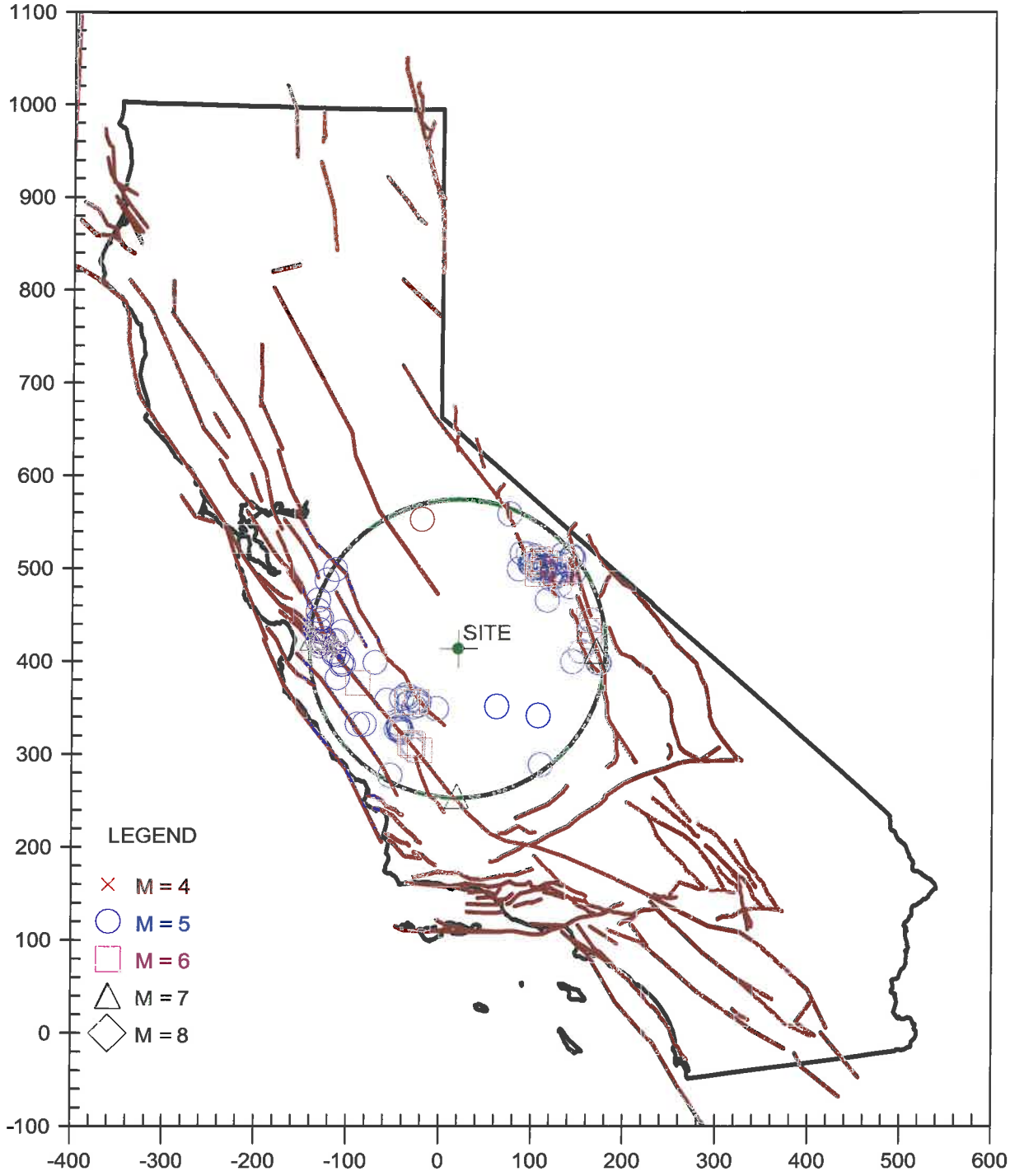
COEFFICIENTS FOR GUTENBERG & RICHTER RECURRENCE RELATION:
a-value= 1.619
b-value= 0.412
beta-value= 0.949

TABLE OF MAGNITUDES AND EXCEEDANCES:

Earthquake Magnitude	Number of Times Exceeded	Cumulative No. / Year
4.0	134	0.63507
4.5	134	0.63507
5.0	134	0.63507
5.5	58	0.27488
6.0	19	0.09005
6.5	8	0.03791
7.0	3	0.01422
7.5	2	0.00948

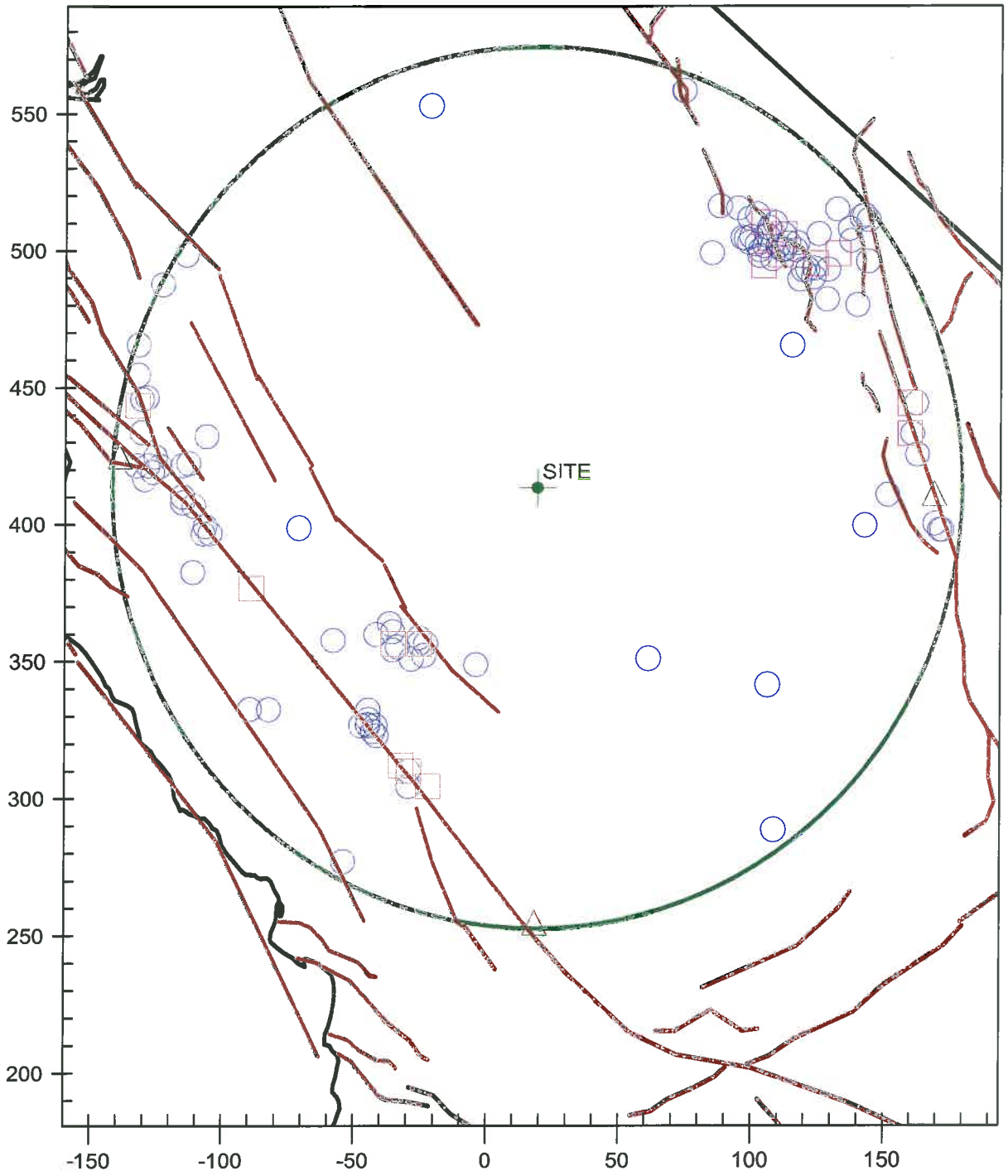
EARTHQUAKE EPICENTER MAP

01411022a



EARTHQUAKE EPICENTER MAP

01411022a



Appendix F: Hazardous Materials

F.1 - Supplemental Assessment to Fulton Mall Corridor Phase I Environmental Site Assessment

State of California
DEPARTMENT OF TRANSPORTATION

Business, Transportation and Housing Agency

Memorandum

Flex your power!
Be energy efficient!

To: KIMLEY SAWTELL
Associate Environmental Planner
Central Region QA/QC Branch

Date: May 29, 2013
File: Fulton Mall
EFIS: 06-0002-0006

From: JUERGEN VESPERMANN
Chief, Central Region Hazardous Waste and Paleontology Branch

Subject: Fulton Mall Reconstruction Supplemental Assessment to Fulton Corridor Phase I ESA, FRE County, California

The Caltrans Hazardous Waste Branch is providing supplemental assessment and oversight for the Fulton Mall Reconstruction Project as it relates to hazardous waste issues along the project. This supplemental assessment provides a more in depth review of recognized environmental concerns (RECs) identified in the attached City of Fresno's Fulton Corridor Phase I Environmental Site Assessment (ESA) Specific Plan Project Area (SPPA) conducted by Krazan & Associates, Inc. (Krazan) in October 2011 and a more recent database search and file review of sites that have been identified as environmental areas of concern. The original ESA conducted in October by Krazan was too broad.

BACKGROUND

The California Department of Transportation (Caltrans), as assigned by the Federal Highway Administration (FHWA), in cooperation with the City of Fresno (City) proposes to reconstruct Fulton Mall as a complete street by reintroducing vehicle traffic lanes to the existing pedestrian mall. The Mall consists of six linear blocks that were open to traffic prior to 1964 but now do not allow public vehicle access. The Mall is bounded by Tuolumne Street to the north and Inyo Street to the south, and includes portions of three cross streets. The total length of the new roadways would be 0.74 mile. Figures 1-1 and 1-2 show project vicinity and location maps.

The "Mall" refers specifically to the pedestrian areas between adjoining buildings located on the former City streets of Fulton, Mariposa, Merced and Kern, which function as an integrated pedestrian Mall. Fresno Street and Tulare Street, which do allow vehicle traffic, run through the Mall and divide it into three roughly equal sections. Mall landscaping elements include fountains, planters, benches, sculptures, electrical systems, irrigation systems and two "tot lots." The Mall does not include the adjoining buildings or their facades.

Each Build Alternative proposes to reconstruct the Mall using "Complete Streets" design concepts. Complete streets are those designed to function as shared public space, or as "living streets" – for pedestrians, cyclists, outdoor businesses, and slow-moving, cautiously driven vehicles. Complete streets may include narrow roadways, corner bulb-outs, winding streets, and other traffic calming measures to lower driving speeds; street trees and other landscape elements; wide pedestrian sidewalks and crosswalks; and bicycle accommodations such as dedicated bicycle lanes or wide shoulders. The purpose of incorporating these design concepts into the proposed project is to retain portions of the historic fabric and character of the Mall, maintaining the key elements, feeling and unique experience of a pedestrian mall in downtown Fresno.

The proposed project has three Alternatives, including two Build Alternatives and a No Build Alternative. No additional right-of-way will be required.

The three alternatives are as follows:

1. Alternative #1 consists of reopening the Mall with two-way streets, with one lane of vehicular traffic in each direction alongside bicycle, pedestrian, and potentially other travel modes. On-street vehicle parking spaces would be reintroduced along the length of the Mall (including cross streets), and construction of streetscape improvements will optimize the streets for the new blend of travel modes. One 11-foot vehicle travel lane would run in each direction, with a parallel parking lane of 9 feet included on both sides of the streets. A 20-foot sidewalk included on both sides of the streets would allow for walking and pedestrian-only seating, landscaping, lighting, and public art.

   The existing 20 sculptures present on the Mall today would all remain, though some may be moved so as to be incorporated in sidewalk areas of the new streetscape. Only the three fountains found along the Kern Mall, west of Fulton, would remain. All of the planter beds and raised seating areas found along the Mall would be removed in favor of wide sidewalks that incorporate artwork and seating areas. The two tot lots present, one located near the corner of Merced and Fulton, and the other located near the corner of Kern and Fulton, would be relocated and potentially combined into one larger tot lot near the corner of Kern and Home Run Alley, or near the corner of Mariposa and Fulton. Impacts to native earth during project construction are not anticipated.

2. Alternative #2 consists of reconnecting the street grid as in Alternative #1, but would include rebuilding distinctive elements of the Mall in five to six specific locations, known as "vignettes." The vignettes would include many of the existing elements (sculptures, fountains, pavement pattern, trees, etc.). One 11-foot vehicle travel lane would run in each direction and would bend and curl through the vignettes. Outside the vignette areas, the street would straighten, and the

landscape would include a 9 foot parallel parking lane and a pedestrian-only walking, seating, vegetation, and public art area 20 feet in width on one or both sides of the street. Within the vignettes, there would be no parking lane, and the existing Mall landscape elements would be kept maximally intact. The remaining space on each side of the street would be dedicated to pedestrian travel, seating, vegetation and art work.

A total of 12 fountains – nine in vignettes and three on Kern Mall west of Fulton – would remain in place. The 12 fountains would be fully rebuilt or restored to working order. Fourteen of 20 sculptures would remain in their current locations. The other six (along with the various tile mosaics benches on the Mall today) would be reconfigured within the current right-of-way to accommodate the new streetscape. Street lighting outside the vignettes would be contemporary and pedestrian-oriented, but the original Mall fixtures would be retained within each vignette. The two tot lots present, one located near the corner of Merced and Fulton, and the other located near the corner of Kern and Fulton, would be relocated and potentially combined into one larger tot lot near the corner of Kern and Home Run Alley, or near the corner of Mariposa and Fulton. Impacts to native earth during project construction are not anticipated.

3. The third Alternative is the No-Build Alternative. New streets will not be constructed and the Mall will remain, as it now exists.

Krazan's SPPA identifies a portion of the study area related to the Fulton Mall Reconstruction Project parameters as "**Area 1** – *Fulton* Area Mixed-Use Neighborhoods. Evidence of potential hazardous materials use was almost exclusively limited to the aforementioned H Street and Broadway corridors, where some automotive service businesses were noted among numerous older industrial buildings. Former auto dealership buildings which now house commercial businesses were also noted along Tuolumne Street.

Krazan's assessment that "evidence of potential hazardous materials use was almost exclusively limited to the aforementioned H Street and Broadway corridors, where some automotive service businesses were noted among numerous older industrial buildings. Former auto dealership buildings which now house commercial businesses were also noted along Tuolumne Street," still holds true.

In March 2010, Krazan reviewed the RWQCB Leaking Underground Fuel Tank (LUFT) database records available via the Geotracker website for the Fulton Corridor Specific Plan project area subject site. Eleven active LUFT and cleanup sites were revealed. Additionally, no Federal Superfund National Priorities List (NPL) sites were determined to be located within a one-mile radius of the subject site (See Table No. VI and Figures No. 6 and 7). Only two of the sites identified in SPPA are relevant to the Fulton

Reconstruction Project based on project boundaries and scope of work. The properties of concern identified in Table VI of Krazan's SPPA include the Greyhound Bus Depot, 1033 Broadway, an open LUFT case with Petroleum Hydrocarbon Contamination (PHC) and Van Waters and Rodgers, 1152 G Street, cleanup site with tetrachloroethene (PCE) release to soil/groundwater.

In order to provide site specific, accurate, up to date information as it relates to the Fulton Mall Reconstruction project, Caltrans Hazardous Waste searched the following five Cal/EPA Data Resources, commonly referred to as the 'Cortese List', for this supplemental assessment:

- EnviroStor database, List of Hazardous Waste and Substances sites, Department of Toxic Substances Control (DTSC)
- Geotracker database, List of Leaking Underground Storage Tank sites, State Water Resources Control Board
- Sites Identified With Waste Constituents Above Hazardous Waste Levels Outside The Waste Management Unit, State Water Resources Control Board
- CDO/CAO List, List of active Cease and Desist Orders and Cleanup and Abatement Orders, State Water Resources Control Board
- List of hazardous waste facilities subject to corrective action, DTSC

In addition the:

- SWIS database, Solid Waste Information System, Department of Resources Recycling and Recovery (CalRecycle) was reviewed.

DATABASE/ RECORDS SEARCH RESULTS

The database search identified three open case (actively worked on) Leaking Underground Storage Tank (LUST) cleanup sites as well as closed or documented clean-up sites within the Fulton Mall Resconstruction Project boundaries that have the potential to affect this project.

1. BROADWAY FURNITURE PARKING LOT (FORMER SERVICE STATION)
755 BROADWAY FRESNO, CA 93721 ***LUST Cleanup Site*** ***Cleanup Status: Completed - Case Closed*** ***RB Case #: 5T10000837*** ***Loc Case #: FA0277130***

2. GREYHOUND BUS DEPOT
1033 BROADWAY FRESNO, CA 93721 ***LUST Cleanup Site*** ***Cleanup Status: Open - Remediation*** ***RB Case #: 5T10000457***

Loc Case #: FA0169029

3. VAN WATERS & ROGERS INC - FRESNO FACILITY
1152 G ST FRESNO, CA 93706-3319 ***Cleanup Program Site*** ***Cleanup Status: Open - Assessment & Interim Remedial Action*** ***RB Case #: SL185704255***

SUPPLEMENTAL RESULTS/ RECOMMENDATIONS

Of the identified sites, only one, Broadway Furniture Parking Lot (identified as #1 above) was **not** previously noted in the study by Krazan. The Site is a closed case (A closure letter or other formal closure decision document has been issued for the site). A diesel/ gasoline leak was reported on October 7, 2004 and Cleanup Action was completed on October 29, 2004. A Closure/ No Further Action Letter was issued on October 6, 2004. The Site is under the authority of Fresno County Environmental Health.

The two open cases identified within the project boundaries include Greyhound Bus Depot (#2 above) and Van Waters & Rodgers Inc – Fresno Facility, also known as Univar USA (#3 above), included, due to presence of three monitoring wells inside the project boundaries. The Greyhound Bus Depot site is currently seeking closure under the Low-Threat Underground Storage Tank (UST) Case Closure Policy (Low- Threat Policy) issued by the State Water Resources Control Board (State Board) on May 1, 2012. The Central Valley Regional Water Quality Control Board's (CVRWQCB) comments regarding the closure request indicate closure may be appropriate in a letter dated January 24, 2013 (see a*ttachment 1*). In the letter staff states "previous site assessment work at the Site has established that the source of diesel fuel constituents in soil appears to be the former product lines serving the fuel ports located in the bus parking stalls on the southwest side of the terminal building. The evidence also suggests that diesel fuel has migrated into the adjacent sanitary sewer trenches. However, the lateral extent of diesel fuel migration in the subsurface soil does not appear to extend beyond the limits of the bus parking area. While the vertical extent of diesel fuel constituent migration extends to a depth of at least 70 feet bgs, the pattern of attenuation indicates that groundwater has not been impacted by this release. Groundwater is estimated to be approximately 110 feet below ground surface at the Site. The soil vapor assessment work documented in the previous and current submittals demonstrate that the diesel fuel remaining in the subsurface does not present a threat to human health or groundwater. Based on the information in the case file, it appears closure of this case may be appropriate." As such, the Fulton Mall Reconstruction Project may include work that includes handling petroleum-impacted material (soil and groundwater) generated during excavation near the Bus Depot and sanitary sewer lines if affected. Groundwater fluctuates between 90-110 feet below ground surface (bgs).

monitoring wells were installed in 1996 and showed PCE in the underlying groundwater. In 1998, a vapor extraction system was installed and ran until 2004. The extracted soil vapor is treated using two 2500-pound activated carbon vessels to remove the Volatile Organic Compounds (VOCs). Through subsequent testing a series of groundwater monitoring wells have been installed and continue to be monitored quarterly.

Four new offsite Soil Vapor Extraction (SVE) wells were installed during late 2008. A SVE system is currently extracting soil vapors from five vapor extraction wells located near the highest concentrations of PCE in groundwater and soil. This is located just down gradient of the site. Investigation to assess the lateral and vertical extent of impacts to groundwater is ongoing. A remediation action plan and Report of Waste Discharge has been submitted for insitu biodegration of solvents in groundwater. Waste Discharge Requirements are currently being prepared. There are three monitoring wells (T1-3, T2-2, T2-3) related to The Van Waters and Rodgers Site/ Univar USA within the project boundaries. In a report generated by Nichols Consulting Engineers, dated Dec 11, 2008, "groundwater records from as early as 1997 show groundwater in the study area flowing from a northwestern to northeastern direction. An apparent pumping depression created by City Well 22A located approximately 1,900 feet northwest of the Site appears to have an effect on groundwater flow in the vicinity of the Site". The subject report prepared by Nichols Consulting Engineers summarizes the results of an additional groundwater investigation conducted during 2007 and 2008 including installation of shallow monitoring wells at locations T1-1, T1-2, T1-3, T2-1, T2-2, and T2-3, which are located within the project boundaries.

Despite the risk of groundwater contamination migration, construction activities are **not** likely to affect groundwater on the project based on the scope of work. However, construction activities have the potential to affect established monitoring wells. Coordination with CVRWQB for closure and well destruction of the three monitoring wells within the project boundaries based on Site cleanup actions is recommended.

Several other sites, primarily along the H Street and Broadway corridors, with commercial uses were identified in Krazan's SPPA report. However, these sites are outside the project boundary and pose minimal threat from groundwater contamination given the scope of work identified in the Fulton Mall Reconstruction project. Furthermore, depth of excavation for the project is estimated at 3 feet below ground surface (bgs) and no new right-of-way is required by the City. Krazan's SPPA references State of California Department of Water Resources (DWR*) at approximately 90-110 feet bgs with a Regional Groundwater Flow Direction: Northwest to southwest, DWR* in its report.

LEAD AND ASBESTOS CONTAINING MATERIALS

A lead-based paint survey was not within the scope of this assessment conducted by Krazan. Occupational exposure to lead is regulated by both the Federal Occupational

Safety and Health Administration (OSHA) (29 CFR 1926.62) and California OSHA (Title 8, GISO 5198 and CSO 1532.1). Based on Federal and California OSHA, when disturbing paints which contain lead (any amount of detectable lead), the above-noted OSHA and California OSHA regulations should be followed.

In addition, Krazan's SPPA report addresses Asbestos Containing Construction Materials (ACCMs). "In the event of planned renovation or demolition of residential and/or commercial structures on the subject site, asbestos and LBP surveys should be conducted in order to determine the presence or absence of ACCMs and/or LBP. The National Emissions Standards for Hazardous Air Pollutants (NESHAP) defines regulated asbestos-containing materials. When building maintenance, repair, renovation, or other activities disturb or damage ACCMs, asbestos fibers may be released creating a potential hazard. Therefore, removal of friable and non-friable ACCMs that have the potential to become friable during demolition and/or renovation is federally regulated under the NESHAP. The San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD) is the responsible agency on the local level to enforce the NESHAP and must be notified prior to any demolition and/or renovation activities. If asbestos-containing materials are left in place, an Operations and Maintenance Program (O&M Program) could be developed for the management of asbestos-containing materials if left in place."

Krazan's assessment that "asbestos and LBP surveys should be conducted in order to determine the presence or absence of ACCMs and/or LBP," still holds true

Caltrans Hazardous Waste has identified issues as low risk for the project based on project scope.

If there are any questions or you would like to review the collected hazardous waste information, contact Shawn Ogletree at (559) 445-6404.

* State of California, Department of Water Resources, Lines of Equal Elevation of Water in Wells Unconfined Aquifer, San Joaquin Valley, Spring 2007.

Enclosure:

- PHASE I ENVIRONMENTAL SITE ASSESSMENT CITY OF FRESNO FULTON CORRIDOR SPECIFIC PLAN PROJECT AREA FRESNO, CALIFORNIA, Krazan and Associates, Inc., Project No. 014-10022B October 7, 2011
- *Attachment 1* Central Valley Regional Water Quality Control Board's Response to request to closure request.
- Texas Green Star Environmental L.L.C. Environmental Report – Case Closure Request Report
- Nichols Summary Report Groundwater Investigations Former VW&R Inc., Facility
- *Attachment 2* Geotracker and Envirostor Database Search Map
- Figure 1-4 Project Location Map

Need to receive a copy of the following reports:

- ***Attachment 1*** **Central Valley Regional Water Quality Control Board's Response to request to closure request**
- **Texas Green Star Environmental L.L.C. Environmental Report – Case Closure Request Report**
- **Nichols Summary Report Groundwater Investigations Former VW&R Inc., Facility**
- ***Attachment 2*** **Geotracker and Envirostor Database Search Map**
- **Figure 1-4 Project Location Map.**

F.2 - Additional Hazardous Materials Information

LINK TO THIS MAP

GEOTRACKER

LAYERS

- ☒ SIGNIFIES A CLOSED SITE
- ☑ Leaking Underground Tank (LUST) Cleanup Sites
- ☑ Other Cleanup Sites
- ☑ Land Disposal Sites
- ☑ Military Sites
- ☑ WDR Sites
- ☑ Permitted Underground Storage Tank (UST) Facilities
- ☑ Monitoring Wells
- ☑ DTSC Cleanup Sites
- ☑ DTSC Haz Waste Permit

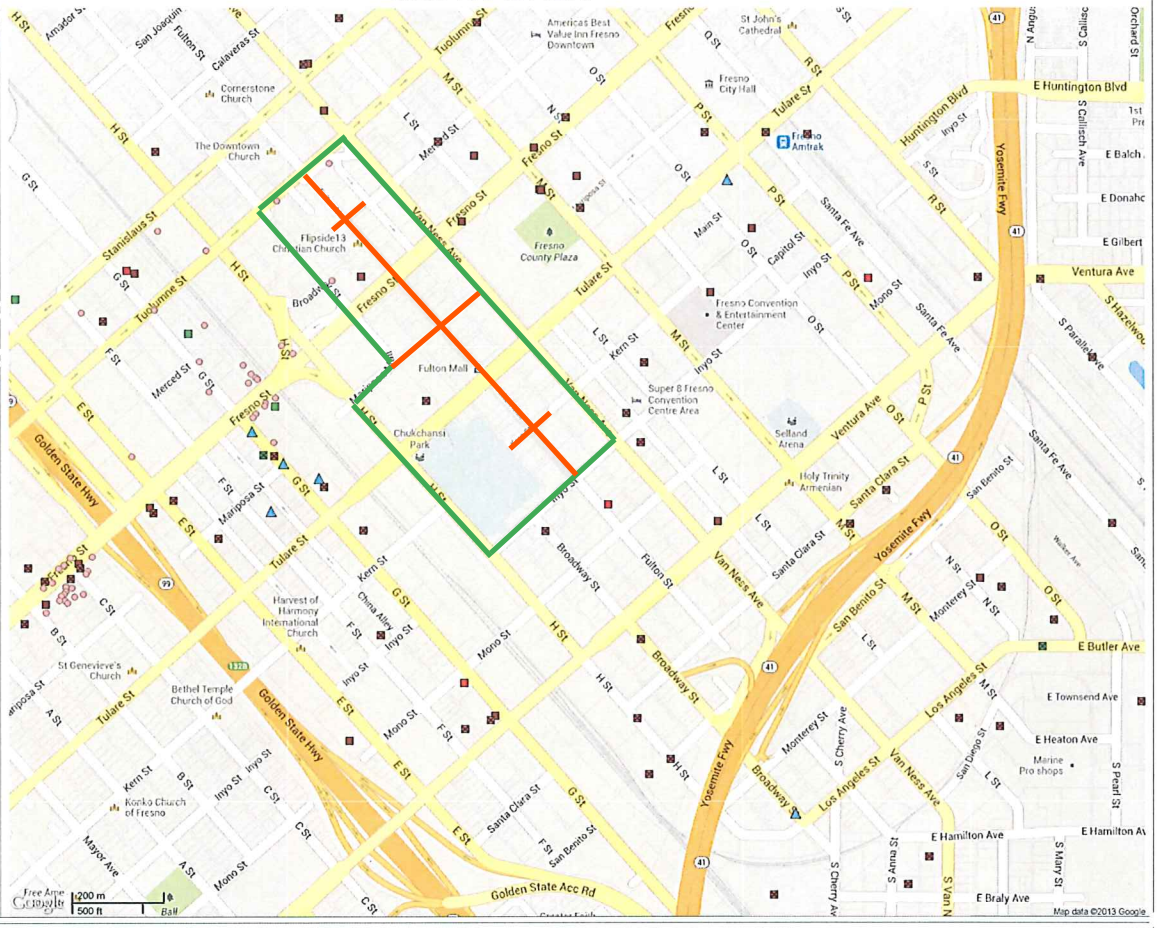
MAP SIZE

1280x1024

OPTIONS

☑ Site List - EXPORT TO EXCEL

83 Sites



☐ SHOW SITES WITHIN 1000 FEET OF THE FOLLOWING ADDRESS: 1152 G St, fresno, ca Go

SITE LIST

SITE NAME	GLOBAL ID	FAC ID	CLEANUP STATUS	ADDRESS	CITY
3M ADVERTISING	T0601900207		COMPLETED - CASE CLOSED	1816 VAN NESS AVE S	FRESNO
7-UP BOTTLING CO	T0601900142		COMPLETED - CASE CLOSED	1865 ANNA S	FRESNO
A PLACE FOR YOU FOUNDATION	T0601900481		COMPLETED - CASE CLOSED	2201 STANISLAUS ST	FRESNO
ABANDONED SERVICE STATION	T0601900122		OPEN - SITE ASSESSMENT	655 G ST	FRESNO
ACE TRANS-STATE TIRES	T0601900030		COMPLETED - CASE CLOSED	565 BROADWAY	FRESNO
ARCHIVES RECORD STORAGE BLDG.	T0601900385		OPEN - SITE ASSESSMENT	742 FULTON ST	FRESNO
AT&T - SB025		FA0266900		1445 VAN NESS AVE #236	FRESNO
BEDROSIAN TRUCK SERVICE		FA0169677		1454 G ST	FRESNO
BEDROSIAN TRUCK SERVICE	T10000002038		OPEN - SITE ASSESSMENT	1454 G STREET	FRESNO
BLUES AUTO	T0601900520		COMPLETED - CASE CLOSED	620 F ST	FRESNO
BNSF/AMTRAK DEPOT	T0601985763		COMPLETED - CASE CLOSED	2650 TULARE ST	FRESNO
BROADWAY FURNITURE PARKING LOT (FORMER SERVICE STATION)	T0601989283		COMPLETED - CASE CLOSED	755 BROADWAY	FRESNO
BEST CASH AND CARRY	T10000004615		OPEN - SITE ASSESSMENT	1550 E STREET	FRESNO

MAP AN ADDRESS Go!

Project Area

Affected Right-of-Way

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

Central Valley Regional Water Quality Control Board

14 May 2013

Mr. Todd Bachand
Environmental Manager
FirstGroup America, Inc.
600 Vine Street, Suite 1400
Cincinnati, OH 45202

CASE CLOSURE, UNDERGROUND STORAGE TANK RELEASE, GREYHOUND BUS DEPOT, 1033 BROADWAY, FRESNO, FRESNO COUNTY, RB CASE 5T10000457

Dear Sir,

This letter confirms the completion of a site investigation and the corrective action for the underground storage tanks release at the above described location. Thank you for your cooperation throughout this investigation. Your willingness and promptness in responding to our inquiries concerning the former underground tanks are greatly appreciated.

Based on the information in the case file, and with the provision that the information provided was accurate and representative of site conditions, this agency finds that the site investigation and corrective action carried out at your underground storage tank(s) site is in compliance with the requirements of subdivisions (a) and (b) of Section 25296.10 of the Health and Safety Code, and with corrective action regulations adopted pursuant to Section 25299.3 of the Health and Safety Code. No further action related to the petroleum release(s) at the site is required. A Case Closure Summary is enclosed.

Be aware that claims for reimbursement of corrective action costs submitted to the Underground Storage Tank Cleanup Fund more than 365 days after the date of this letter, or issuance or activation of the Fund's Letter of Commitment, whichever occurs later, will not be reimbursed unless one of the following exceptions applies:

- Claims are submitted pursuant to Section 25299.57, subdivision (k) (reopened UST case); or
- A submission within the timeframe was beyond the claimant's reasonable control, ongoing work is required for closure that will result in the submission of claims beyond that time period, or that under the circumstances of the case, it would be unreasonable or inequitable to impose the 365-day time period.

This notice is issued pursuant to subdivision (g) of Section 25296.10 of the Health and Safety Code. Please contact Ken Jones at (559) 488-4391, or kjones@waterboards.ca.gov if you have any questions regarding this matter.

Clay L. Rodgers

for Pamela C. Creedon
Executive Officer

Enclosure: Case Closure Summary

cc: Lisa Labrado, UST Cleanup Fund, Sacramento
Steve Rhodes, FCDCH, Fresno
Rick Gerhardt, Fresno
Patrick Wiemiller, City of Fresno, Public Works Director
Bob Little, City of Fresno, Water Division
Debra M. Boopsingh, Green Star Environmental, Arlington, TX

Central Valley Regional Water Quality Control Board

TO: Shelton R. Gray
Senior Engineering Geologist

Lonnie M. Wass
Supervising WRC Engineer

Clay L. Rodgers
Assistant Executive Officer

FROM: Jeff W. Hannel, PG No. 5640
Engineering Geologist

K. D. Jones
Engineering Geologist

DATE: 14 May 2013

SUBJECT: CASE CLOSURE SUMMARY - UNDERGROUND STORAGE TANK RELEASE, GREYHOUND BUS DEPOT, 1033 BROADWAY, FRESNO, FRESNO COUNTY, RB CASE 5T10000457

Case History – The subject address (Site) is occupied by the Greyhound bus terminal which maintained a 12,000-gallon and a 10,000-gallon underground diesel fuel storage tank (UST). The USTs and the associated dispensing equipment were removed in January 1993. Analytical results of soil samples, collected adjacent to the USTs' former locations and beneath the dispensers' former locations, detected concentrations of total petroleum hydrocarbons diesel range constituents (TPHd) as high as 9,100 milligrams per kilogram (mg/kg) at depths between four and five feet below ground surface (bgs). Analytical results of soil samples collected from beneath the former USTs' locations at a depth of 15 feet bgs did not detect TPHd that exceeded laboratory reporting limits. Approximately 175 tons of petroleum product contaminated soil were excavated from around the locations of the former USTs' and dispensers and disposed of properly.

An initial site assessment was conducted in November 1993 with the drilling of seven soil borings to depths between 11.5 and 36.5 feet bgs, where elevated concentrations of TPHd had been discovered during the UST removal. Analyses for TPHd did not detect concentrations above 100 mg/kg except for one at 6.5 feet bgs, in boring SB-1 with a TPHd concentration of 4,500 mg/kg. On 11 October 2007, the Fresno County Department of Public Health (FCDPH) transferred regulatory oversight for the case to the Central Valley Regional Water Quality Control Board (Central Valley Water Board).

In September 2008, a follow-up soil assessment was conducted with the drilling of twelve soil borings with a Geoprobe to depths between 20 and 30 feet bgs (B-8 was terminated at five feet bgs due to refusal). Soil samples were analyzed for TPHd, total petroleum hydrocarbons gasoline range constituents (TPHg), and total petroleum hydrocarbons motor oil range

constituents (TPHmo). The soil samples which tested positive for TPHg and/or TPHmo, were also analyzed for VOCs and poly aromatic hydrocarbons (PAHs).

Concentrations of TPHd greater than 100 mg/kg were detected in samples collected from borings B-3 and B-2. Results indicated significant concentrations of TPHd to a depth of 30 feet bgs, whereas results in 1994 did not detect any significant concentrations below seven feet bgs. In addition, significant concentrations of TPHd were detected in samples from borings B-9 and B-10 to a depth of 30 feet bgs, adjacent to two sanitary hoppers, areas not previously investigated. TPHmo was detected in the sample collected from B-2 at five feet bgs at a concentration of 890 mg/kg. Concentrations of TPHmo at or less than 50 mg/kg were detected in the other soil samples.

TPHg was also detected in most of the soil samples which contained significant concentrations of TPHd. However, the concentrations of TPHg did not exceed 10% of the TPHd detected in the samples, and were typically much less. The soil samples analyzed for VOCs included those with the greatest concentrations of TPHd and TPHg. Benzene and toluene were not detected in excess of the laboratory reporting limit in any sample. The greatest concentration of ethylbenzene detected was 0.2 mg/kg in a sample from 20 feet bgs. None of the samples collected at or above 10 feet bgs contained ethylbenzene which exceeded the laboratory reporting limit of 0.005 mg/kg. The soil samples which exceeded the method detection limit for TPHg from borings B-1, B-2, B-3, B-7, and B-9, were also tested for MTBE, which was not detected above 0.005 mg/kg in any sample. Naphthalene was not detected above a concentration of 2.0 mg/kg in soil samples collected from 10 feet bgs or above.

Analytical results for PAHs reported only Benz(a)anthracene and Chrysene. The sum total of the carcinogenic PAHs detected from 10 feet bgs or above did not exceed 0.2 mg/kg. The greatest concentrations of the carcinogenic PAHs were detected in boring B-3 at 15 feet bgs and the sum did not exceed 0.5 mg/kg.

In March 2009, additional soil assessment was conducted to further delineate the lateral and vertical extent of petroleum products. Borings B-2a, B-3a, B-9a, B-13, and B-14 were drilled using a Geoprobe to depths between 40 and 70 feet bgs. Soil samples were collected from below 30 feet bgs in B-2a, B-3a, and B-9a, and from below 20 feet bgs in B-13 and B-14. The samples were analyzed for TPHd and selected samples were analyzed for TPHmo, VOCs, and PAHs.

Concentrations of TPHd which did not exceed 10 mg/kg, were detected in samples from depths below 30 feet bgs in B-2a and B-3a. Concentrations of TPHd above 1,000 mg/kg, were detected in the samples collected from B-9a to a depth of 60 feet bgs. Concentrations of TPHd less than 10 mg/kg, were detected in the samples from 65 and 70 feet bgs in B-9a. Concentrations of TPHd at less than 20 mg/kg, and TPHmo at or less than 10 mg/kg were detected in samples from B-13 and B-14.

The samples from boring B-9a were analyzed for VOCs and benzene and toluene were not detected above the laboratory reporting limit. Ethylbenzene was detected in samples collected from 35 to 55 feet bgs in concentrations less than 2.0 mg/kg, the sample collected at 60 feet bgs was less than the laboratory reporting limit. Xylenes were detected in the 35 to 55-foot samples at concentrations less than six mg/kg, with the sample from 60 feet bgs at less than the laboratory reporting limit. Naphthalene was detected in all samples from B-9a at concentrations ranging from 2.7 to 25 mg/kg. No carcinogenic PAHs were detected in the samples from boring B-9a.

A soil vapor extraction pilot test was conducted at the Site in March 2011 using two extraction points and four observation points. Soil vapor extraction and observation was performed from depth intervals of between 5 and 30 feet bgs, and between 35 and 60 feet bgs. During the test, a total of 0.165 pounds of naphthalene was removed. (No other petroleum constituent was measured in the extracted vapor samples). Because the mass removed was insignificant during the pilot test, it was concluded additional remediation with soil vapor extraction would be ineffective.

A subsurface soil vapor assessment was conducted in December 2011. Soil vapor samples were collected from five sets of paired vapor probes, with sampling depths of 5 and 10 feet bgs. Boring sets VB-1a and b; VB-4a and b; and VB-5a and b, were located where previous work had discovered petroleum hydrocarbon constituents in the subsurface. Boring sets VB-2a and b; and VB-3a and b were located adjacent to the terminal building onsite, directly between the building and the area of contaminated soil. The samples were analyzed for benzene, toluene, ethylbenzene, xylenes, and isopropyl alcohol using the U. S. EPA Method TO-15. Vapor samples were also analyzed for naphthalene using USEPA Method TO-17.

The analyses of the initial set of soil vapor samples, indicated concentrations of benzene less than 100 micrograms per cubic meter ($\mu g/m^3$), ethylbenzene less than 800 $\mu g/m^3$, and naphthalene less than 20 $\mu g/m^3$. However, the laboratory report indicated the detection limits for sample collected from VB-1b exceeded the applicable California Shallow Soil Gas Human Health Screening Levels (Vapor Intrusion) for Commercial/Industrial Land Use (CHHSL Commercial/Industrial). Furthermore, concentrations of the tracer compound detected in VB-3b indicated a significant leak of ambient air into the sample collected from the probe. Additional sampling was conducted in October 2012 from locations VB-1b and VB-3b to resolve the problems. The analyses of the follow-up soil vapor samples (VB-1c and VB-3c) indicated concentrations of benzene less than 15 $\mu g/m^3$, ethylbenzene less than 70 $\mu g/m^3$, and naphthalene less than 20 $\mu g/m^3$.

Copies of soil sample and soil vapor sample analytical results, tables and figures showing the Site Plan; locations of the soil samples, soil borings, soil vapor extraction wells, and soil vapor probes; cross section; and extent of TPHd in soil are enclosed.

Staff Evaluation – The history of the facility, and the analytical results of the soil samples indicate that the release consisted of diesel fuel. The minor concentrations of TPHg and TPHmo detected are likely due to the overlap of diesel constituents within the analytical range of gasoline and motor oil.

The UST removal report documented the excavation and removal of 175 tons of petroleum contaminated soil. Based on the analytical results from the soil samples collected during the UST removal, the average concentration of the excavated soil is estimated to be 550 mg/kg. Therefore, approximately 200 pounds of diesel fuel was removed with the contaminated soil.

The area of the TPHd impacted soil is roughly defined by soil borings B-2, B-3, B-9, and B-10, and is approximately 1,800 square feet. The volume of impacted soil appears to be the deepest in the vicinity of B-9 (at least 70 feet) and shallower beneath B-2 and B-3, at about 30 feet. Based on a worst case estimate, approximately 3,000 cubic yards of TPHd impacted soil remain beneath the Site which contains approximately 11,000 pounds of diesel fuel or approximately 1,600 gallons.

Depth to groundwater in 1993 was at least 86 feet bgs, but more recently groundwater is at approximately 110 feet bgs at the Site. The nearest significant surface water body is Dry Creek Canal, approximately 1.4 miles north of the Site. The nearest active municipal water supply well is the City of Fresno Well #003a at Santa Clara and F Street, approximately 3,000 feet south of the Site.

Low Threat Closure Evaluation – On 1 May 2012 the State Water Resources Control Board adopted the Low-Threat Underground Storage Tank Closure Policy (Policy). The criteria for closure under the Policy and evidence the case meets the criteria are outlined below:

General Criteria:

1. The unauthorized release is within the service area of the City of Fresno's public water system.
2. The unauthorized release consists only of petroleum.
3. The unauthorized (primary) release from the UST system has been stopped. All USTs, fuel delivery piping, dispensers, and associated equipment have been removed from the Site.
4. No free product has been discovered at the Site.
5. A conceptual site model (CSM) had been developed. The elements of the CSM are incorporated in the soil assessment reports submitted for this case, listed below in the References.
6. Secondary source has been removed to the extent practicable.
7. Soil has been tested for MTBE and results reported in accordance with Health and Safety Code section 25296.16.
8. Nuisance as defined by Water Code section 13050 does not exist at the Site.

Media Specific Criteria:

A. Groundwater Specific Criteria – The TPHd impacted soil does not contain sufficient mobile constituents to cause groundwater to exceed the groundwater criteria in the Policy.

B. Petroleum Vapor Intrusion to Indoor Air – Soil vapor assessment at the Site demonstrates that petroleum vapor intrusion to indoor air will have no significant risk of adversely affecting human health. Meets the criterion listed in Appendix 4, Scenario 4 (1 of 2) in the Policy.

C. Direct Contact and Outdoor Air Exposure – Soil assessment at the Site has demonstrated the concentrations of petroleum constituents in near-surface soil will have no significant risk of adversely affecting human health through direct contact with contaminated soil or inhalation of contaminants volatized to outdoor air. The detected concentrations of benzene, ethylbenzene and naphthalene in shallow soil were less than threshold concentrations listed in Table 1 of the Policy for commercial/industrial, or utility worker category.

Public Notice of the pending case closure was posted 24 January 2013, and no comments or inquiries were received. An inspection was conducted by Central Valley Water Board staff on 24 April 2013 following destruction of the soil vapor extraction wells and observation points. No evidence of investigation waste was found.

Appendix G:
Sole-Source Aquifer - Water Quality Assessment

Technical Memorandum

Sole-Source Aquifer - Water Quality Assessment

Prepared For: Wilma Quan
City of Fresno

Copy To: Abdul Chafi, Caltrans

Prepared by: FirstCarbon Solutions | Michael Brandman Associates

Date: July 9, 2013

The purpose of this memorandum is to review and evaluate the potential short- and long-term water quality impacts to the City of Fresno's sole-source aquifer that may result from construction and implementation of the proposed Fulton Mall Project.

Project Purpose and Need

The purpose of the proposed project is to improve parking and vehicle access to local businesses on Fulton Street in order to maximize sustainable development and economic productivity in conjunction with other downtown redevelopment projects. The proposed project is also intended to lower crime and improve safety for people walking between parking areas and businesses located on the Fulton Mall and for people who live in, work in, and visit the project area.

Proposed Project

The California Department of Transportation (Caltrans), as assigned by the Federal Highway Administration (FHWA), in cooperation with the City of Fresno (City) proposes to reconstruct Fulton Mall as a complete street by reintroducing vehicle traffic lanes to the existing pedestrian mall. The Mall consists of 6 linear blocks that were open to traffic prior to 1964 but now do not allow public vehicle access. The Mall is bounded by Tuolumne Street to the north and Inyo Street to the south, and includes portions of three cross streets. The total length of the new roadways would be 0.74 mile.

The "Mall" refers specifically to the pedestrian areas between adjoining buildings located on the former City streets of Fulton, Mariposa, Merced, and Kern, which function as an integrated pedestrian Mall. Fresno Street and Tulare Street, which do allow vehicle traffic, run through the Mall and divide it into three roughly equal sections. Mall landscaping elements include fountains, planters, benches, sculptures, electrical systems, irrigation systems, and two "tot lots." The Mall does not include the adjoining buildings or their façades.

Each Build Alternative proposes to reconstruct the Mall using "complete streets" design concepts. Complete streets are those designed to function as shared public space, or as "living streets"—for pedestrians, cyclists, outdoor businesses, and slow-moving, cautiously driven vehicles. Complete streets may include narrow roadways, corner bulb-outs, winding streets, and other traffic calming measures to lower driving speeds; street trees and other landscape elements; wide pedestrian sidewalks and crosswalks; and bicycle accommodations such as dedicated bicycle lanes or wide shoulders. The purpose

of incorporating these design concepts into the proposed project is to retain portions of the historic fabric and character of the Mall, and maintain the key elements, feeling, and unique experience of a pedestrian mall in downtown Fresno.

The proposed project has three Alternatives, including two Build Alternatives and a No Build Alternative.

Alternative 1 consists of reopening the Mall with two-way streets, with one lane of vehicular traffic in each direction alongside bicycle, pedestrian, and potentially other travel modes. On-street vehicle parking spaces would be reintroduced along the length of the Mall (including cross streets), and construction of streetscape improvements would optimize the streets for the new blend of travel modes. One 11-foot vehicle travel lane would run in each direction, with a parallel parking lane of 9 feet included on both sides of the streets. A 20-foot sidewalk included on both sides of the streets would allow for walking and pedestrian-only seating, landscaping, lighting, and public art.

The existing 20 works of sculpture present on the Mall today would all remain, although some may be moved so as to be incorporated in sidewalk areas of the new streetscape. Only the 3 fountains found along the Kern Mall, west of Fulton, would remain. All of the planter beds and raised seating areas found along the Mall today would be removed in favor of wide sidewalks that incorporate artwork and seating areas. The two tot lots present, one located near the corner of Merced and Fulton, and the other located near the corner of Kern and Fulton, would be relocated and potentially combined into one larger tot lot on Kern Mall between Fulton Street and Home Run Alley, or near the corner of Mariposa and Fulton. Impacts to native earth during project construction are not anticipated.

Alternative 2 consists of reconnecting the street grid as in Alternative 1, but would include rebuilding distinctive elements of the Mall in five to six specific locations, known as “vignettes.” The vignettes would include many of the existing elements (sculptures, fountains, pavement pattern, trees, etc.). One 11-foot vehicle travel lane would run in each direction and would curve through the vignettes to avoid existing landscape features. Outside the vignette areas, the street would be straight, and the landscape would include a 9-foot parallel parking lane and pedestrian-only walking, seating, vegetation, and public art areas 20 feet wide on one or both sides of the street. Within the vignettes, the existing Mall landscape elements would be kept maximally intact. The remaining space on each side of the street would be dedicated to pedestrian travel, seating, vegetation, and artwork.

A total of 12 fountains—9 in vignettes and 3 on Kern Mall west of Fulton—would remain in place. The 12 fountains would be fully rebuilt or restored to working order. Fourteen of the 20 sculptures would remain in their current locations. The other 6 (along with the various tile mosaics benches on the Mall today) would be configured differently within the current right-of-way to accommodate the new streetscape. Street lighting outside the vignettes would be contemporary and pedestrian-oriented, but the original Mall fixtures would be rehabilitated within each vignette. The 2 tot lots present, 1 located near the corner of Merced and Fulton, and the other located near the corner of Kern and Fulton, would be relocated and potentially combined into one larger tot lot on Kern Mall between Fulton Street and Home Run Alley, or near the corner of Mariposa and Fulton. Impacts to native earth during project construction are not anticipated.

The third Alternative is the no-build Alternative. New streets would not be constructed and the Mall would remain as it now exists.

Environmental Setting

Topography

The Fulton Mall project study area consists predominantly of developed land consistent with the characteristics of an urban center. Single- and multi-story buildings are located throughout the project study area. Fulton Mall and the Cross Malls consist of paved pedestrian pathways. The project study area has generally flat topography at an elevation of approximately 290 feet above mean sea level.

Climate

The City of Fresno has an "inland Mediterranean" climate including long, hot, dry summers and short, foggy winters with low rainfall. The average winter temperatures are in the high 50s degrees Fahrenheit (°F); temperatures below freezing are unusual. Average summer temperatures are in the 90s°F; however, over the greater Fresno area the average is 95°F. Many summer days have highs exceeding 100°F. The City of Fresno experiences, on average, a little more than 10 inches annual precipitation.

Soils

The general soil profile within Fulton Mall study area consists of four separate soil series: Delhi loamy sand, Hanford sandy loam, Madera loam, and San Joaquin sandy loam. The soils within the majority of the study area have been altered from their natural state because of grading and compaction for the construction of the existing Fulton Mall and adjacent buildings and infrastructure.

Surface Water

The primary surface water feature within the City of Fresno is the San Joaquin River, which generally serves as the City's northern boundary. At 366 miles long, the San Joaquin River is the largest river in Central California, spanning from the Sierra Nevada Mountains to the San Francisco Bay via the San Joaquin Valley. Much of the water that flows through the San Joaquin River is used for irrigation purposes, as much of the agricultural production in the San Joaquin Valley depends on water that at least originated in the River.

The San Joaquin River has been identified by the Central Valley Region Water Quality Control Board (RWQCB) as having numerous beneficial uses, including municipal and domestic water supply, agricultural, industrial, recreational, freshwater and wildlife habitat, and migration and spawning grounds. Water quality in the San Joaquin River is affected by both natural and anthropogenic sources, including soil erosion; stormwater runoff; wastewater discharges, industrial, residential, and agricultural runoff; recreational activity; and flora and fauna. While the segment of the San Joaquin River in the City is not considered substantially impaired, significant downstream portions of the River throughout the Valley and near the Sacramento-San Joaquin Delta are affected by various constituents and pollutants, usually because of agricultural runoff. The portion of the San Joaquin River in the City does, however, appear on the State Water Resources Control Board's 2010 Impaired Water Bodies/303(d) List for invasive species (non-native fish species).

In addition to the San Joaquin River, a network of agricultural canals and flood control channels traverse the City. Numerous agricultural ponds, recharge basins, and other similar features also dot the City's landscape.

Ground Water

The City of Fresno is underlain by the Kings River Subbasin, which, along with 6 other subbasins, comprises the San Joaquin Basin. In turn, the San Joaquin Basin is located within the Tulare Lake Hydrologic Region. The Tulare Lake Hydrologic Region spans approximately 10.9 million acres (17,000 square miles) and includes most of Fresno County. The Region encompasses the southern one-third of the Central Valley Regional Water Quality Control Board (RWQCB).

Groundwater quality throughout the Tulare Lake Hydrologic Region is generally suitable for most urban and agricultural uses, and meets primary and secondary drinking water standards for municipal use. Local impairments are found in the Tulare Lake Hydrologic Region's groundwater supply, however, with high total dissolved solids (TDS), nitrate, arsenic, and organic compounds acting as the primary constituents of concern within the Region. With the exception of western portion of the Tulare Lake Hydrologic Region, the Region lacks any substantial low permeability units that would isolate deep from shallow aquifers. As such, most of the aquifer underlying the project area is unconfined. As a single, unconfined aquifer, the groundwater basin within the project area has been designated as a Sole Source Aquifer as authorized by Section 14246 of the Federal Safe Drinking water Act of 1974. This designation means that project area is dependent on a single source of groundwater and that this sole source must be protected from contamination.

While the groundwater supply within the Kings River Subbasin generally meets drinking water standards, with the exception of the northwest portion of the City, extensive contamination occurs throughout the City. Of the City's 272 groundwater wells, 96 wells are impacted by one contaminant plume, 33 wells are impacted by two contaminant plumes, and 5 wells are impacted by three contaminant plumes. Thirty-four of the City's active wells currently have wellhead treatment systems.

Several different types of pollutants have contaminated portions of the City. Major contaminant plumes include dibromochloropropane (DBCP), ethylene dibromide (EDB), trichloropropane (TCP), other volatile organic compounds (VOCs) like trichlorethylene (TCE), tetrachloroethylene (PCE), nitrate, manganese, radon, chloride, and iron. Nitrate, pesticides, and nutrients in agricultural drainage are currently found within much of the project area's groundwater supply, and their levels exceed some drinking water standards established by the State. While nitrates may occur naturally, their presence is often attributed to anthropogenic reasons. Leaking septic tanks, which are prevalent in the less dense southeast portion of the City, are a substantial source of nitrate contamination. Another major problem facing the City's groundwater supply is the presence of DBCP in the City's groundwater wells. This fumigant was widely used in the 1960s to control nematodes in vineyards and is now present in down gradient groundwater wells.

Storm Drainage System

Storm drain facilities are located within the Fulton Mall study area. A storm drain is located under Fulton Mall between Inyo Street and Tuolumne Street. Addition storm drains are located within Merced Mall between Van Ness Boulevard and H Street, Fresno Street between Van Ness Boulevard and H Street, Mariposa Mall between the alley east of Fulton Mall and H Street, Tulare Street between the alley west of Fulton Mall and H Street, Kern Mall between the alley west of Fulton Mall and the alley east of Fulton Mall, and along Home Run Alley between Kern Mall and Tulare Street. Each of the existing subsurface drainage distribution facilities identified above is currently adequate to serve the existing uses.

The existing Fulton Mall and the Cross Malls currently have storm drain inlets that convey water to the existing subsurface drainage distribution facilities. There are currently 63 storm drain inlets within Fulton

Mall and 32 storm drain inlets within the Cross Malls. The existing storm drain inlets within the malls are adequate to convey storm water to the subsurface drainage distribution facilities.

The existing subsurface storm drain facilities are connected to one of several larger east-west and northeast-southwest trending trunk lines. These trunk lines connect with a series of existing drainage basins located along S. West Street in the southwestern portion of the City of Fresno and extend to existing retention basins.

Potential Project Impacts

Short-Term Construction Impacts

Construction of the proposed Fulton Mall project would require reconstruction activities that would disturb more than one acre. During these activities, there would be a potential for stormwater flows to carry onsite sediments, debris, and constituents into the existing storm drainage facilities that serve the project area. Once within the storm drainage system, these materials could be conveyed downstream and into local waterways. Since these materials have the potential to enter the storm drainage system during the construction phase, there is a potential for the proposed project to degrade water quality. As addressed in the Environmental Setting discussion above, the project area is underlain by a single, unconfined aquifer. In light of this, any degradation of water quality within this aquifer would be especially problematic, as the groundwater basin within the project area has been designated as a Sole Source Aquifer as authorized by Section 14246 of the Federal Safe Drinking Water Act of 1974.

Project construction would also require the use of gasoline- and diesel-powered equipment and vehicles, including bulldozers, backhoes, flatbed trucks, water pumps, and air compressors. Chemicals such as gasoline, diesel fuel, oils, paints, and solvents would likely be used during project construction. An accidental release of any of these substances could degrade the quality of stormwater runoff and contribute additional sources of pollution into the storm drainage system.

There are, however, regulatory mechanisms in place that would reduce the effects of project construction on water quality, including the National Pollutant Discharge Elimination System (NPDES) General Permit. Construction of the proposed project would be required to comply with the requirements of the NPDES General Permit. The NPDES Permit Program, which is administered by the Central Valley RWQCB, helps control water pollution by regulating point sources that discharge pollutants into receiving waters during both construction and operational activities.

Any development project disturbing more than one acre of soil must obtain coverage under the General Permit for Discharges of Storm Water Associated with Construction Activity (Construction General Permit Order 2009-0009-DWQ). Construction activities subject to the Construction General Permit includes clearing, grading, and other ground- disturbing activities such as stockpiling or excavation. The Construction General Permit requires development and implementation of a Storm Water Pollution Prevention Plan (SWPPP). Among other mandated items that are included in a SWPPP, the SWPPP would contain features designed to protect against substantial soil erosion as a result of water and wind erosion, known as Best Management Practices (BMPs). Common BMPs include maintaining or creating drainages to convey and direct surface runoff from bare areas and installing physical barriers such as berms, silt fencing, waddles, straw bales, and gabions.

Surface water drainage from the Fulton Mall study area is conveyed to existing retention basins that are used to recharge groundwater. The implementation of BMPs as part of the SWPPP would minimize effects on the sole-source aquifer.

Long-Term Operational Impacts

Based on highway storm water runoff data collected by the Caltrans Storm Water Research and Monitoring Program, typical pollutants from California highways include heavy metals, sediment, and litter. All constituents and parameters in nearby surface water bodies found to be elevated or exceeding published water quality standards could be potential concerns for the proposed project.

The pedestrian mall is currently served by 95 storm drain inlets that collected surface flows from the project area. Adjacent streets such as Fresno and Tulare Streets also have their own storm drain facilities that convey flows from the roadway. Both the onsite and adjacent storm drain facilities presently connect with the existing storm drain facilities located throughout Fulton Mall vicinity, as addressed in the Environmental Setting discussion above. These existing storm drain facilities are connected to one of several larger east-west and northeast-southwest trending trunk lines, which eventually connect with a series of existing drainage basins located along S. West Street in the southwestern portion of the City of Fresno. As previously stated, the existing subsurface drainage distribution facilities identified above are currently adequate to serve the existing uses found in the project area.

Due to the reconstruction of Fulton Mall and the Cross Malls with the implementation of complete streets for Fulton, Kern, Mariposa, and Merced streets, the location of the existing storm drain inlets will be modified. The existing storm drain inlets that are located within the future street (i.e., between the proposed curbs and gutters of each street) will be relocated to the curb face because the future streets will be designed to include a crown in the middle of the street so that surface water will flow to the curb face.

The project will also include the reconstruction of the sidewalks adjacent to the future streets. Therefore, there may be relocation of additional existing storm drain inlets. The inlets may remain in the sidewalks or the sidewalk may be graded so that surface water flows to the street and eventually to the storm drain inlets at the curb face.

Although the proposed project would potentially reintroduce vehicles onto Fulton, Mariposa, Merced, and Kern Streets, the project would not contribute additional pollutants to the existing storm drain system because the project will result in a redistribution of existing vehicles. No increase in vehicles would occur with the implementation of the project. Therefore, the project would result in no long-term impact on water quality and will not have a long-term impact on the existing sole-source aquifer.

Mitigation Measures

Prior to the issuance of grading permits, construction of the Fulton Mall project would be required to comply with all applicable requirements of the NPDES Permit Program, which includes the preparation and participation with the Construction General Permit and implementation of a SWPPP and BMPs. Notice of Construction (NOC) shall be submitted to the Central Valley Regional Water Quality Control Board (RWQCB) at least 30 days before the start of construction and submission of a Notice of Construction Completion (NCC) shall be submitted to the RWQCB upon completion of construction and stabilization of the project site.

Prior to the issuance of a grading permit, specific locations of relocated storm drain inlets within the existing malls shall be approved by the City of Fresno Public Works Department.

Prior to issuance of a grading permit, a response plan for accidental spills during construction activities shall be prepared.

Implementation of the above measures would minimize the short-term construction impacts on water quality.

Appendix H:
Community Impact Assessment

Fulton Mall Reconstruction Project

Community Impact Assessment

Fulton Mall, City of Fresno
Fresno County, California

Federal Project # TCSPL-5060(263)

Prepared By: Michael E. Houlihan, AICP
FirstCarbon Solutions | Michael Brandman Associates

Date: September 5, 2013

Prepared for: California Department of Transportation

The environmental review, consultation, and any other action required in accordance with applicable federal laws for this project is being, or has been, carried out by the Department under its assumption of responsibility pursuant to 23 U.S. Code 327.

September 2013

Table of Contents

Table of Contents 1
List of Figures 3
List of Tables 3
Chapter 1 Introduction 4
1.1 What is a Community Impact Assessment 4
1.2 Laws and Regulation 4
1.3 Assessment Process and Methodology Used 7
1.4 Proposed Project 7
1.5 Project Area 11
1.6 Project Study Area 12
1.7 Regional Area 12
Chapter 2 Land Use 13
2.1 Existing and Future Land Use 13
2.1.1 Affected Environment 13
2.1.2 Environmental Consequences 21
2.1.3 Avoidance, Minimization, and Mitigation Measures 22
2.2 Consistency with Federal, State, Regional, and Local Plans 22
2.2.1 Affected Environment 22
2.2.2 Environmental Consequences 28
2.2.3 Avoidance, Minimization, and Mitigation Measures 32
2.3 Park and Recreation 33
2.3.1 Affected Environment 33
2.3.2 Environmental Consequences 33
2.3.3 Avoidance, Minimization, and Mitigation Measures 34
Chapter 3 Growth 35
3.1 Affected Environment 35
3.2 Environmental Consequences 35
3.3 Avoidance, Minimization, and Mitigation Measures 37
Chapter 4 Community Character 38
4.1 Population and Housing 38
4.1.1 Affected Environment 38
4.1.1.1 Housing 45
4.1.2 Environmental Consequences 46
4.1.2.1 Regional Population Characteristics/Community Character 46
4.1.2.2 Neighborhoods/Communities/ Community Character 46
4.1.2.3 Housing 46
4.1.3 Avoidance, Minimization, and Mitigation Measures 47
4.2 Economic Conditions 47
4.2.1 Affected Environment 47
4.2.1.1 Regional Economy 47
4.2.1.2 Employment and Income 47
4.2.1.3 Business Activity 48
4.2.2 Environmental Consequences 49
4.2.2.1 Regional Economy 49
4.2.2.2 Employment and Income 49

4.2.2.3 Business Activity 50
4.2.3 Avoidance, Minimization, and Mitigation Measures 51
4.3 Community Facilities and Services 51
4.3.1 Affected Environment 51
4.3.1.1 Community Facilities 51
4.3.1.2 Emergency Services 52
4.3.1.3 Utilities 52
4.3.2 Environmental Consequences 54
4.3.2.1 Community Facilities 54
4.3.2.2 Emergency Services 55
4.3.2.3 Utilities 55
4.3.3 Avoidance, Minimization, and Mitigation Measures 56
4.4 Relocations 56
4.4.1 Affected Environment 56
4.4.2 Environmental Consequences 56
4.4.3 Avoidance, Minimization, and Mitigation Measures 56
4.5 Environmental Justice 57
4.5.1 Affected Environment 57
4.5.2 Environmental Consequences 59
4.5.3 Avoidance, Minimization, and Mitigation Measures 61
Chapter 5 Traffic and Transportation/ Pedestrian and Bicycle Facilities 62
5.1 Affected Environment 62
5.1.1 Access, Circulation, and Parking 62
5.1.2 Public Transportation 63
5.2 Environmental Consequences 63
5.2.1 Access, Circulation, and Parking 63
5.2.2 Public Transportation 64
5.3 Avoidance, Minimization, and Mitigation Measures 65
Appendix A References Used and Contacts 66
Appendix B List of Preparers 68

List of Figures

Figure 1-1: Regional Vicinity Map 8
Figure 1-2: Project Study Area 9
Figure 2-1: Existing Land Use 15
Figure 2-2: Existing Zoning 17
Figure 2-3: General Plan Updated Land Use 18
Figure 4-1: Project Study Area - Census Blocks 39
Figure 4-2: Project Vicinity - Census Tracts 41

List of Tables

Table 1: Land Use and Building Square Footage within Fulton Mall Study Area 13
Table 2: Development Potential Within FCSP and DNCP 21
Table 3: Population and Race 43
Table 4: Poverty Status (Income) 44

Chapter 1 Introduction

This Community Impact Assessment is prepared for the Fulton Mall Reconstruction by Caltrans, or an authorized agent, in accordance with Caltrans standards as defined in the Standard Environmental Reference. The information in this document has been prepared to comply with the National Environmental Policy Act (NEPA), and other substantive environmental laws applicable to the subjects addressed in this document.

Per authority under "NEPA Assignment Memorandum of Understanding", the environmental review, consultation, and any other action required in accordance with applicable federal laws for this project is being, or has been, carried out by Caltrans under its assumption of responsibility pursuant to 23 U.S. Code 327.

This Community Impact Assessment addresses land use, growth, community character, and traffic/transportation/pedestrian and bike facilities. This assessment does not include the following topics because they will be addressed as part of focused technical studies.

Air Quality	Noise
Biology	Traffic
Cultural Resources	Visual
Hazardous Materials	Water Quality/Sole-Source Aquifer

1.1 What is a Community Impact Assessment

The purpose of this report is to provide information regarding social, economic, and land use effects of the project so that final transportation decisions will be made in the public interest. The report is intended to clearly describe the relevant existing conditions and the potential socioeconomic impacts of the project.

The National Environmental Policy Act requires consideration of social and economic impacts of projects in the preparation of the environmental document.

1.2 Laws and Regulation

Consideration of federal, state, and local environmental laws, executive orders, and other policies in the planning process is noted below.

National Environmental Policy Act (NEPA). The project has been evaluated in accordance with the requirements as set forth in Section 102 of NEPA, CEQ Regulations for Implementing the Procedural Provisions of NEPA (40 CFR 1500 et seq.). Reasonable alternatives have been considered during the planning process. Potential environmental effects have been included in the evaluation for the project alternatives, and all procedural review requirements of the aforementioned rules and regulations will be met as part of the environmental process.

Section 106 of the National Historic Preservation Act of 1966, as Amended. Section 106 of the National Historic Preservation Act provides for the preservation of significant historical and archaeological data from loss and destruction. A Historic Resources Evaluation Report and a Historic Property Survey Report have been prepared for the project.

Section 4(f) of The Department of Transportation Act. This section preserves publicly owned public parklands, waterfowl and wildlife refuges, and significant historic sites. A Section 4(f) evaluation has been prepared for the proposed project.

Section 6(f) of the Land and Water Conservation Act. Act requires that the conversion of lands or facilities acquired with Land and Water Conservation Act funds be coordinated with the Department of Interior. The project site includes two tot lots within Fulton Mall that were improved in 2008 with Land and Water Conservation Act funds. The proposed project includes the relocation of both of these resources into two separate or one combined tot lot within the project area. A Section 6(f) evaluation has been prepared in conjunction with the Section 4(f) evaluation.

Title VI of the Civil Rights Act of 1964. Title VI of the Civil Rights Act of 1964 prohibits discrimination based on race, color, and national origin in programs and activities receiving federal financial assistance. The City of Fresno is receiving federal financial assistance for the proposed project. The implementation of the project will increase the economic productivity, access and visibility, quality of life benefits, and improved use of cultural resources that will be provided to all people and will not result in discrimination based on race, color, or national origin. Therefore, the proposed project would comply with Title VI of the Civil Rights Act of 1964.

Executive Order (EO) 12898 - Environmental Justice. This Executive Order requires the identification and evaluation, as appropriate, of disproportionately high and adverse human health or environmental effects of Federal programs, policies, and activities on minority populations and low-income populations. The evaluation found that the

proposed project would not cause disproportionately high and adverse effects on any minority or low-income populations.

The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, and as amended in 1987. Compliance with this act ensures that owners of real property to be acquired for Federal or federally-assisted projects are treated fairly and consistently, and to encourage and expedite acquisition. The proposed project will not result in the acquisition of real property because the project is located within existing rights-of-way of Fulton Mall, Kern Mall, Mariposa Mall, and Merced Mall. The project will result in the temporary relocation of five vendors who currently have a business license to use mobile retail carts within the mall area. During construction, these vendors will be required to relocate to portions of the malls that are not under construction.

The Americans with Disabilities Act (ADA) of 1990. This Act prohibits discrimination based on disability that is defined as a physical or mental impairment that substantially limits a major life activity. The proposed project includes ADA access at intersections throughout the project. In addition, ADA access will be provided during construction activities. Therefore, the proposed project would comply with this Act.

CFR 652 Accommodation for Pedestrians and Bicyclists. This regulation requires that the safe accommodation of pedestrians and bicyclists be given full consideration during the development of Federal-aid highway projects, and during the construction of such projects. The special needs for the elderly and the handicapped shall be considered in all Federal-aid projects that include pedestrian facilities. Where current or anticipated pedestrian and/or bicycle traffic present a potential conflict with motor vehicle traffic, every effort shall be made to minimize the detrimental effects on all highway users who share the facility.

Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) incorporates Sections 109(h). This Act provides funds for transportation enhancement activities such as landscaping and beautification, rehabilitation and operation of historic transportation facilities. The proposed project does not anticipate receiving ISTEA funds therefore, this Act does not apply to the proposed project.

Section 128 of Title 23 (Highways) of the United States Code of Federal Regulations (CFR). Section 128 states that any state transportation department which submits plans for a Federal-aid highway project involving the by passing of or, going through any city, town, or village, either incorporated or unincorporated, shall certify to the Secretary that it has had public hearings, or has afforded the opportunity for such hearings. The

proposed project is not extending through a city, town, or village; and therefore, Section 128 does not apply to the proposed project.

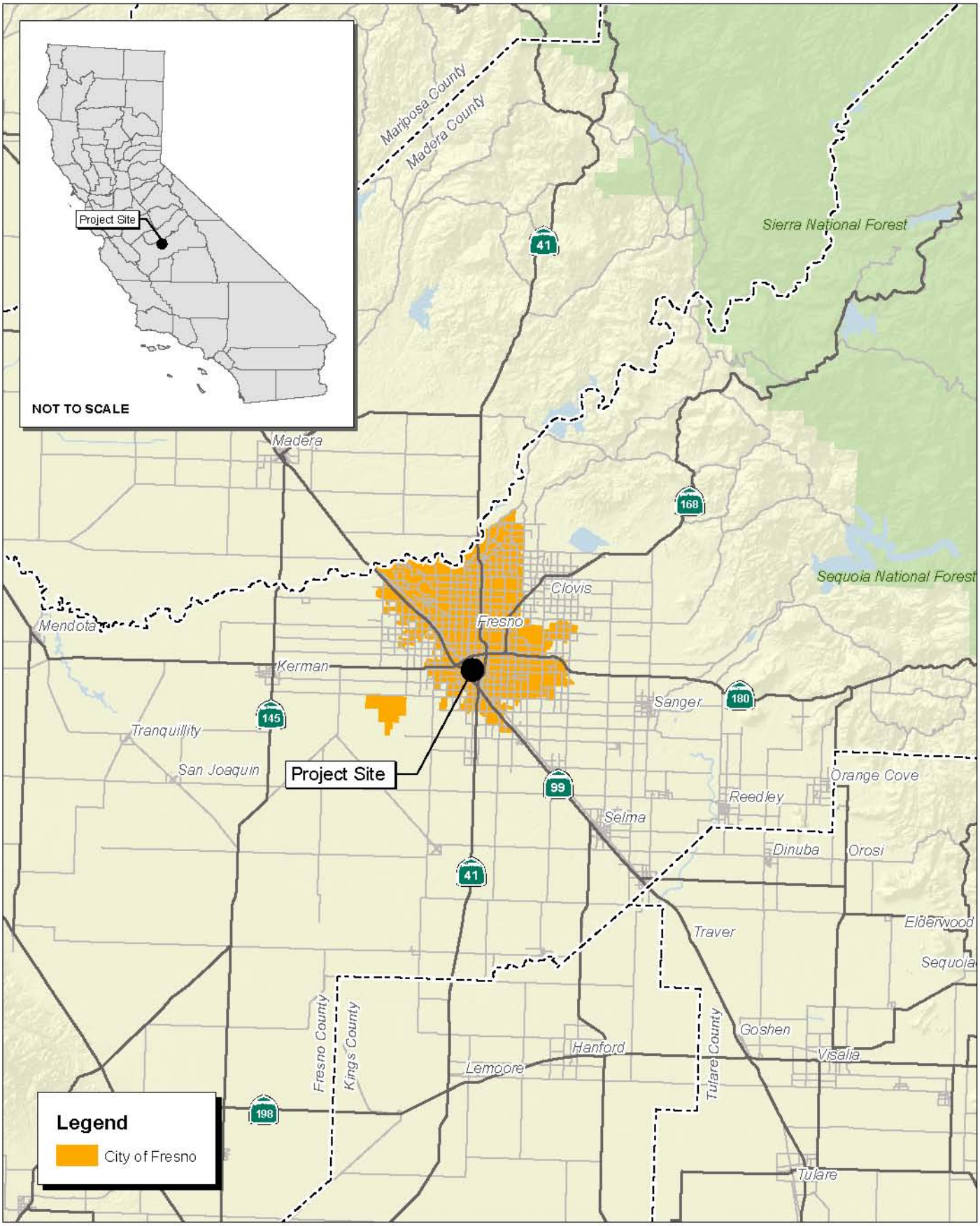
1.3 Assessment Process and Methodology Used

This community impact assessment used various methods to characterize the project area. The identification of land use was described using the existing land use plans, aerial photography, as well as a site visit. Growth information as well as economic information was based on an Urban Decay Study that was prepared for the Fulton Corridor Specific Plan. Community characteristics were based on Census information at the tract level for population and race as well as poverty status. Information regarding the character of the community of the Project Study Area was also based on discussions with City staff and a site visit. Traffic and transportation information was based on a traffic report prepared for Fulton Mall as well as a review of aerial photographs and the Fresno Area Express website information for bus routes.

1.4 Proposed Project

The purpose of the proposed project is to improve parking and vehicle access to local businesses on Fulton Street in order to maximize sustainable development and economic productivity in conjunction with other downtown redevelopment projects. The proposed project would also be intended to lower crime and improve safety for people walking between parking areas and businesses located on the Fulton Mall and for people who live in, work in, and visit the project area.

The California Department of Transportation (Caltrans), as assigned by the Federal Highway Administration (FHWA), in cooperation with the City of Fresno (City) proposes to reconstruct Fulton Mall as a complete street by reintroducing vehicle traffic lanes to the existing pedestrian mall. The Mall consists of six linear blocks that were open to traffic prior to 1964 but now do not allow public vehicle access. The Mall is bounded by Tuolumne Street to the north and Inyo Street to the south, and includes portions of three cross streets. The total length of the new roadways would be 0.74 mile. Figure 1-1 illustrates the regional vicinity and Figure 1-2 shows the project study area and project area.



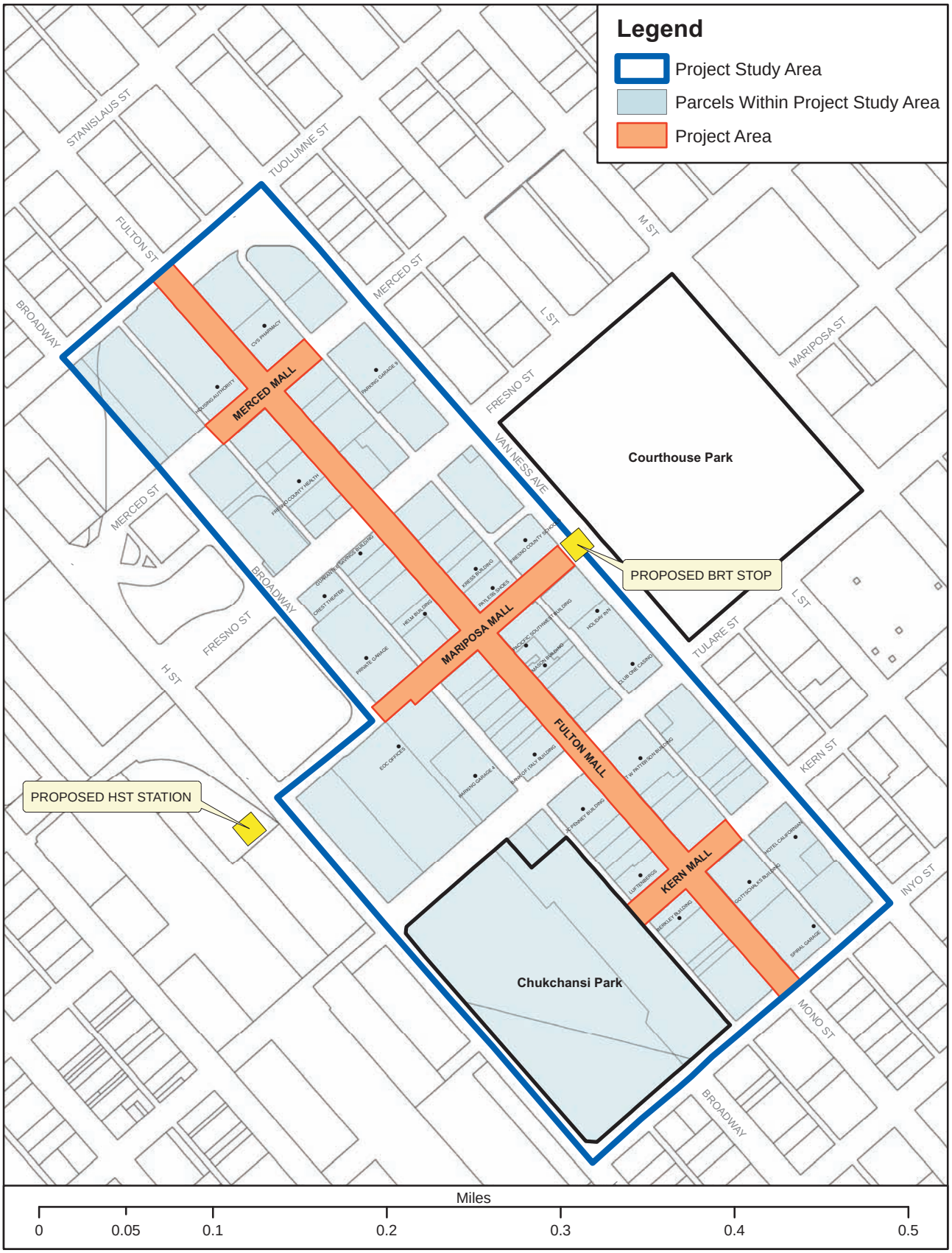
Source: Census 2000 Data, The CaSIL, MBA GIS 2013.

Michael Brandman Associates

NORTH

10 5 0 10 Miles

Figure 1-1
Regional Vicinity Map



Michael Brandman Associates

Figure 1-2
Project Study Area

The "Mall" refers specifically to the pedestrian areas between adjoining buildings located on the former City streets of Fulton, Mariposa, Merced, and Kern, which function as an integrated pedestrian mall. Fresno Street and Tulare Street, which do allow vehicle traffic, run through the Mall and divide it into three roughly equal sections. Mall landscaping elements include fountains, planters, benches, sculptures, electrical systems, irrigation systems, and two "tot lots." The Mall does not include the adjoining buildings or their facades.

Each Build Alternative proposes to reconstruct the Mall using "complete streets" design concepts. Complete streets are those designed to function as shared public space, or as "living streets" - for pedestrians, cyclists, outdoor businesses, and slow-moving, cautiously driven vehicles. Complete streets may include narrow roadways, corner bulb-outs, winding streets, and other traffic calming measures to lower driving speeds; street trees and other landscape elements; wide pedestrian sidewalks and crosswalks; and bicycle accommodations such as dedicated bicycle lanes or wide shoulders. The purpose of incorporating these design concepts into the proposed project is to retain portions of the historic fabric and character of the Mall, maintaining the key elements, feeling and unique experience of a pedestrian mall in downtown Fresno.

The proposed project has three Alternatives, including two Build Alternatives and a No Build Alternative.

Alternative 1 consists of reopening the Mall with two-way streets, with one lane of vehicular traffic in each direction alongside bicycle, pedestrian, and potentially other travel modes. On-street vehicle parking spaces would be reintroduced along the length of the Mall (including cross streets), and construction of streetscape improvements would optimize the streets for the new blend of travel modes. One 11-foot vehicle travel lane would run in each direction, with a parallel parking lane of 9 feet included on both sides of the streets. A 20-foot sidewalk included on both sides of the streets would allow for walking and pedestrian-only seating, landscaping, lighting, and public art.

The existing 20 works of sculpture present on the Mall today would all remain, though some may be moved to be incorporated in sidewalk areas of the new streetscape. Only the three fountains found along the Kern Mall, west of Fulton, would remain. All of the planter beds and raised seating areas found along the Mall today would be removed in favor of wide sidewalks that incorporate artwork and seating areas. The two tot lots present, one located near the corner of Merced and Fulton, and the other located near the corner of Kern and Fulton, would be consolidated into one larger tot lot at the Fresno

County Economic Opportunities Commission campus near the intersection of Mariposa and Congo Alley.

Alternative 2 consists of reconnecting the street grid as in Alternative #1, but would include rebuilding distinctive elements of the Mall in five to six specific locations, known as "vignettes." The vignettes would include many of the existing elements (sculptures, fountains, pavement pattern, trees, etc.). One 11-foot vehicle travel lane would run in each direction and would curve through the vignettes to avoid existing landscape features. Outside the vignette areas, the street would be straight, and the landscape would include a 9- foot parallel parking lane and a pedestrian-only walking, seating, vegetation, and public art area 20 feet in width on one or both sides of the street. Within the vignettes, the existing Mall landscape elements would be kept maximally intact. The remaining space on each side of the street would be dedicated to pedestrian travel, seating, vegetation, and artwork.

A total of 12 fountains—nine in vignettes and 3 on Kern Mall west of Fulton—would remain in place. The 12 fountains would be fully rebuilt or restored to working order. Fourteen of 20 sculptures would remain in their precise current locations. The other six (along with the various tile mosaics benches on the Mall today) would be reconfigured differently within the current right-of-way to accommodate the new streetscape. Street lighting outside the vignettes would be contemporary and pedestrian-oriented, but the original Mall fixtures would be rehabilitated within each vignette. The two tot lots present, one located near the corner of Merced and Fulton, and the other located near the corner of Kern and Fulton, would be consolidated into one larger tot lot at the Fresno County Economic Opportunities Commission campus near the intersection of Mariposa and Congo Alley.

The third Alternative is the no-build Alternative. New streets would not be constructed and the Mall would remain as it now exists. Currently, there are seven of the original 20 fountains within the Mall landscape that are in working order. Three sculptures have been placed in storage due to vandalism and the threat of theft.

1.5 Project Area

The project area includes those areas of the project that will be directly and physically affected. These areas include the 80-foot right-of-way of Fulton Mall between Inyo Street and Tuolumne Street, the 80-foot right-of-way of Kern Mall between Federal Alley and Home Run Alley, the 80-foot right-of-way of Mariposa Mall between Van Ness

Avenue and Broadway Plaza, and the 80-foot right-of-way of Merced Mall between Federal Alley and Congo Alley.

1.6 Project Study Area

The study area for the Fulton Mall Reconstruction includes Fulton Mall, Kern Mall, Mariposa Mall, and Merced Mall and the building and structures adjacent to these malls (Figure 1-2). In addition to land uses within structures adjacent to the malls, the study area was established based on existing circulation. The original vision for the malls was the establishment of a core superblock that encompassed 12 city blocks with a ring road adjacent to the superblock. The creation of a car-free core superblock was not fully implemented because Tulare Street and Fresno Street continued to provide access through the Fresno Mall area. The boundaries of the original superblock form the boundaries of the study area. The study area extends from Inyo Street on the south to Tuolumne Street to the north and from Van Ness Avenue on the east to Broadway Street and H Street on the west.

The Project Study Area, which encompasses approximately 65 acres, is located within the 655-acre Fulton Corridor Specific Plan (FCSP) that provides long-term goals and detailed policies for the future development within the FCSP. The FCSP is located within the 7,290-acre Downtown Neighborhoods Community Plan (DNCP), which also provides goals and policies for the future development within the DNCP area. Both the FCSP and DNCP includes implementation plans to foster growth, improve access and parking, and increase sustainable development and economic productivity in downtown Fresno.

1.7 Regional Area

The regional area for this community impact assessment is defined as the City of Fresno city limits that encompass approximately 113 square miles (72,224 acres) and extends from the San Joaquin River on the north to just south of Central Avenue on the south and from Grantland Avenue on the west to approximately Temperance Avenue on the east.

Chapter 2 Land Use

2.1 Existing and Future Land Use

This section describes the existing and future land uses within the Fulton Mall study area. The study area currently has a mix of land uses and approximately 29 percent of the structures are vacant. The majority of the vacancy within the study area includes office uses, which represent approximately 12 percent of all structures, and retail/restaurant uses, which represent approximately 17 percent of all structures within the study area.

2.1.1 Affected Environment

Existing Land Uses

The Fulton Mall study area includes office, retail/restaurant, recreation-clubhouse, other commercial such as a hotel and theater, and residential (Figure 2-1). The structures located along Fulton Mall include multiple stories with storefronts on the ground floor and additional uses within the upper stories. The study area includes structures that range from one story to 16 stories. Based on a review of the Urban Decay Study prepared for the Fulton Mall in 2012, approximately 26 percent of the ground floor storefronts within the Project Study Area are vacant. Table 1 depicts the amount of building square footage for each land use within the study area.

Table 1: Land Use and Building Square Footage within Fulton Mall Study Area

Land Use	Total Building Square Footage
Office[1]	648,964
Retail / Restaurant[2]	1,232,504
Rec - Clubhouse[3]	46,007
Other Commercial[4]	164,075
Residential[5]	149,003
Parking	239,184
Total	2,479,737

Table 1 (cont.): Land Use and Building Square Footage within Fulton Mall Study Area

Land Use	Total Building Square Footage

[1] Office is identified on Figure 2-1 as co and pgo.

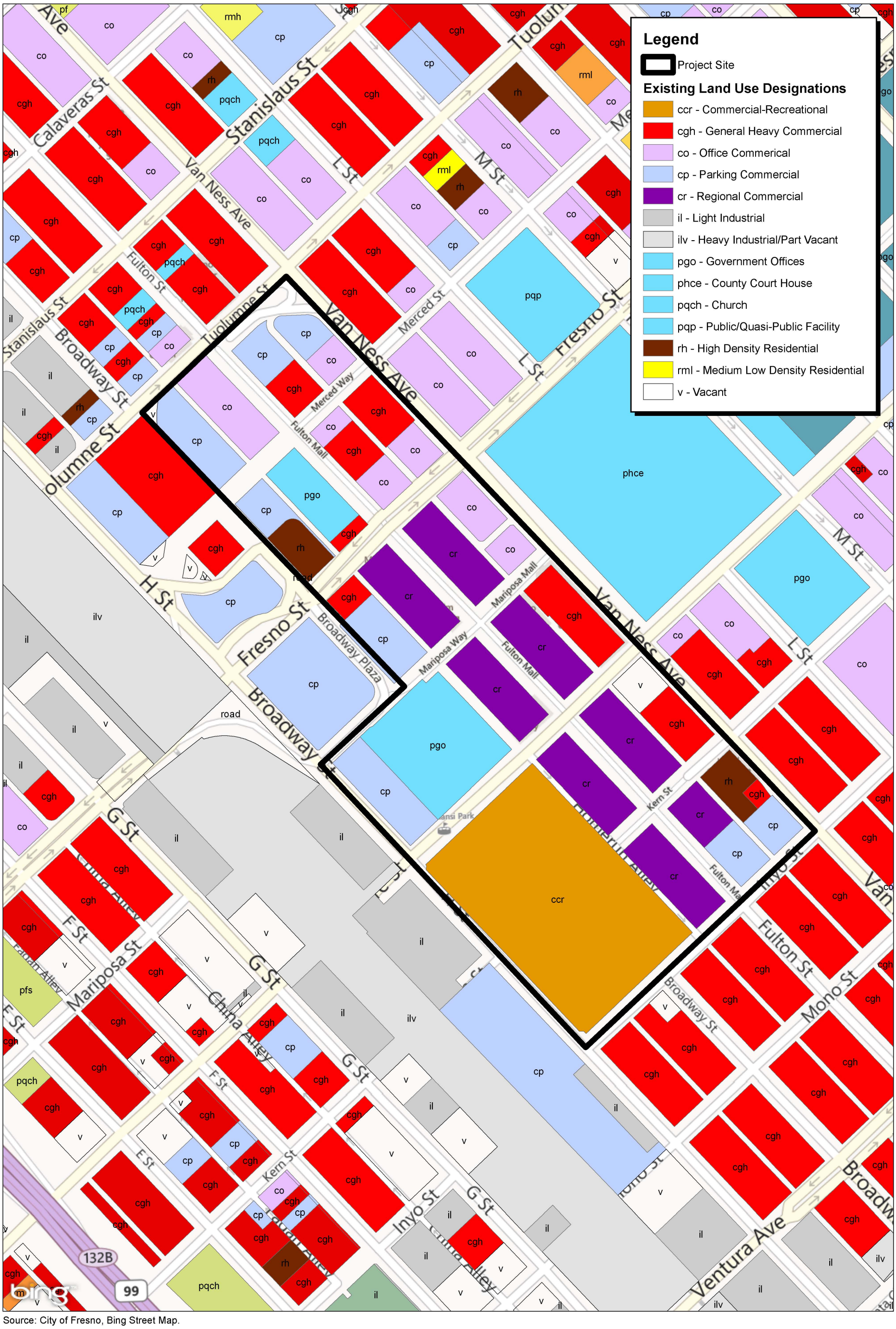
[2] Retail/Restaurant is identified on Figure 2-1 as cgh and cr.

[3] Recreation Clubhouse is identified on Figure 2-1 as ccr. This includes the clubhouse facilities associated with Chukchansi Park.

[4] Other Commercial is identified on Figure 2-1 as cgh.

[5] Residential is identified on Figure 2-1 as rh. There is a co designation that currently includes residential.

Source: Rosenow Spavacek Group, Inc., 2012.



Source: City of Fresno, Bing Street Map.

Michael Brandman Associates

NORTH

380 190 0 380 Feet

31680017 • 06/2013 | Fig_2-1_existing_lu.mxd

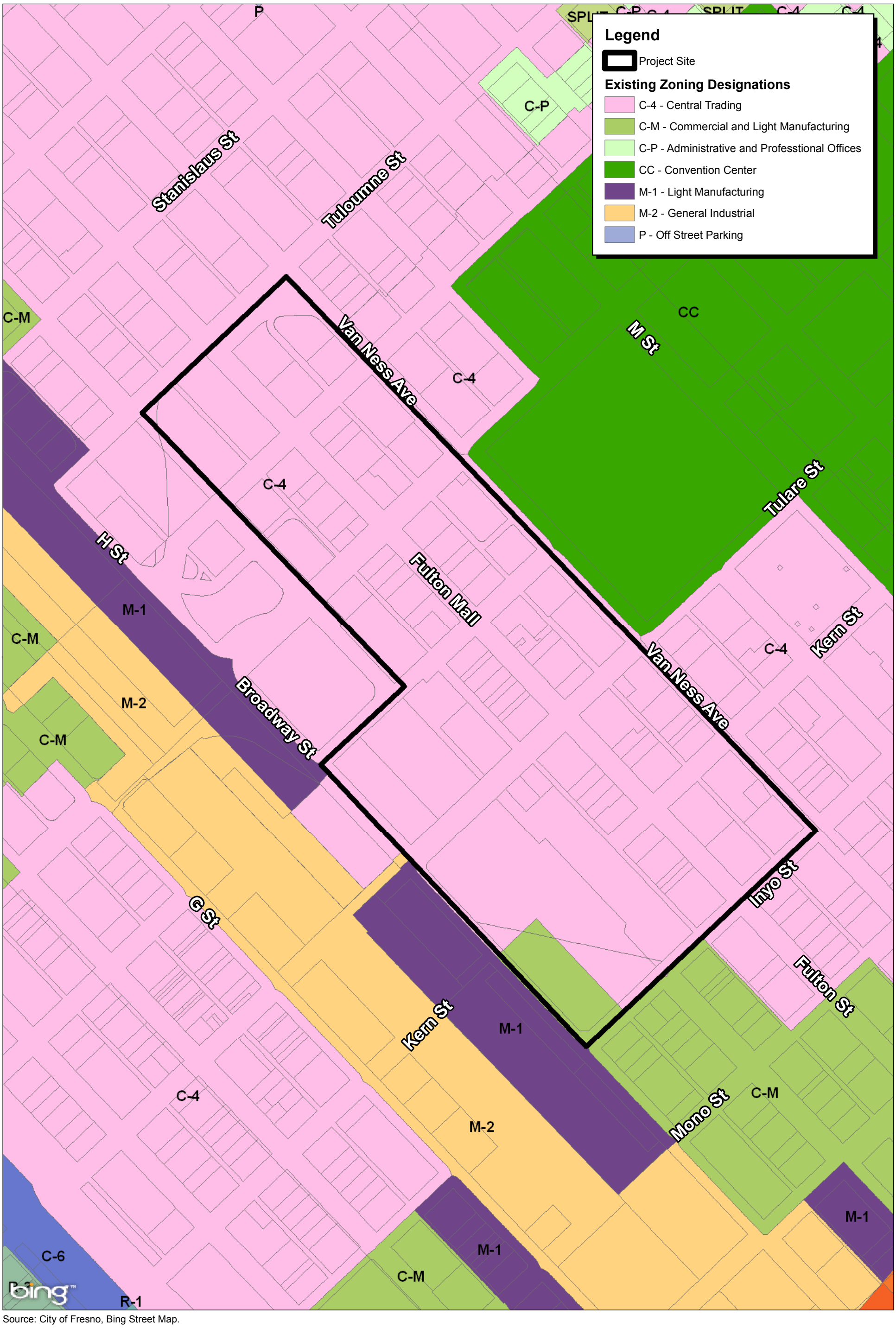
Figure 2-1
Existing Land Use

The study area also includes surface parking, structured parking, and a vacant lot. The study area includes approximately 2,800 parking spaces. Approximately 75 percent of those spaces are located within structures while 25 percent of the parking spaces are within surface parking lots. There are 14 on-street parking spaces within the study area. There is one vacant lot at the southwest corner of Tulare Street and Van Ness Avenue. The vacant lot encompasses approximately 20,000 square feet (sf).

In addition to land uses within the existing structures along Fulton Mall, there are two recreational areas for children within Fulton Mall. These areas are tot lots with playground equipment and sand areas. One of the tot lots is located within Fulton Mall immediately north of Kern Mall and encompasses 966 sf of active play equipment area. The second tot lot is also within Fulton Mall immediately south of Merced Mall and encompasses 806 sf of active play equipment area. These lots were improved with new play equipment in 2008 using federal Land and Water Conservation Fund (LWCF) and State Proposition 40 grant dollars, and their future use and conversion is governed by Section 6(f) of the LWCF Act. Today most, though not all, of this equipment remains functional for the children to use.

Planned Land Uses

The Fulton Mall study area is currently zoned as Commercial Trading District (C-4) (Figure 2-2). Based on a review of the City of Fresno Zoning Ordinance, this designation allows a variety of retail, commercial, office, and residential uses. The City is currently proposing a specific plan, Fulton Corridor Specific Plan (FCSP) that encompasses the study area. The FCSP encompasses approximately 655 acres within the downtown area and proposes the entire study area to be designated Central Business District 1. This proposed designation would allow land uses that consist of commercial, retail, and office activity to support active streetscapes and walking located on ground levels within buildings. Upper floors and the floor area behind shop fronts are flexible for a wide variety of office, civic, lodging, housing or additional commercial uses. The intent of the FCSP is to encourage investment and growth within the downtown area. The land uses identified in the FCSP are consistent with the General Plan Update land use designations within the Project Study Area (Figure 2-3).



Source: City of Fresno, Bing Street Map.

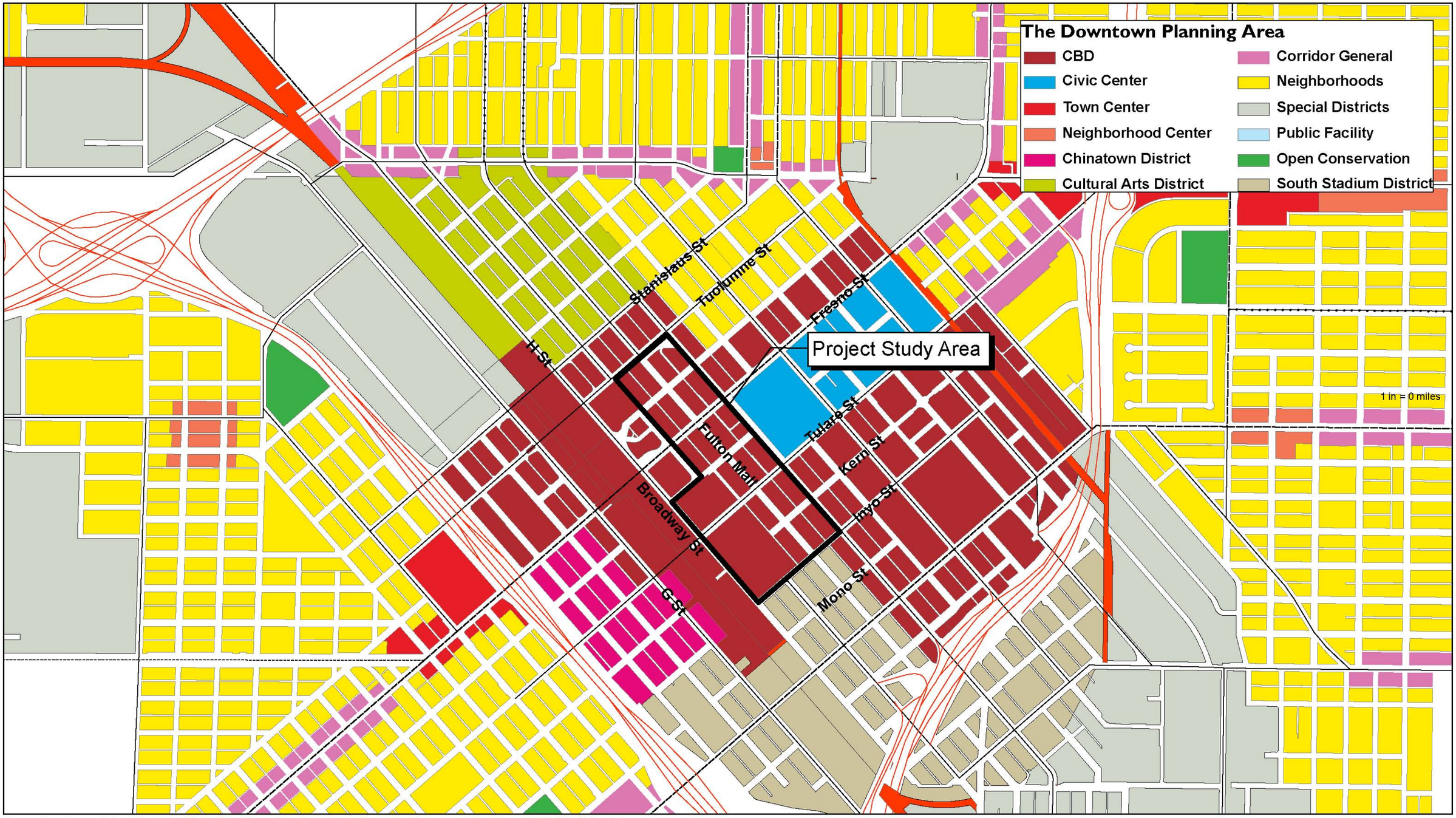
Michael Brandman Associates

NORTH

380 190 0 380 Feet

Figure 2-2
Existing Zoning

31680017 • 06/2013 | Fig_2-2_existing_zoning.mxd



Source: Boundary and circulation information, City of Fresno Development And Resource Management Department, 2010; World Street Map, developed by Esri using DeLorme basemap layers, Automotive Navigation Data, USGS, UNEP-WCMC, Tele Atlas Dynamap, 2009

NORTH

Michael Brandman Associates

Figure 2-3
General Plan Updated Land Use

Within the Fulton Mall Project Study Area, there are development applications that have been submitted to the City. These applications include the following:

1. CVS is proposing to relocate from their current location at the northeast corner of Fulton Mall and Merced Mall and construct a new 15,524 sf retail store at the corner of Van Ness Avenue and Tuolumne Street. Construction is anticipated to be completed in 2014.

2. 1155 Fulton Mall - Tenant improvements are proposed with minor exterior improvements for new Federal offices. These improvements are anticipated to be completed in 2013.

3. 1101 Fulton Mall - Tenant improvements are proposed for a new restaurant. Timing of these improvements is not known.

4. 959 Fulton Mall (JC Penney Building) - Tenant improvements are proposed for approximately 66 residential units on the second through the fifth floors. According to property owner, timing of these improvements are contingent on the Fulton Mall Reconstruction Project.

5. Pacific Southwest Building at the southeast corner of Fulton Mall and Mariposa Mall - Tenant improvements are proposed for a restaurant lounge on the 15th and 16th floors. According to property owner, timing of these improvements are contingent on the Fulton Mall Reconstruction Project.

6. Hotel Californian at the southwest corner of Van Ness Avenue and Kern Street - Tenant improvements are proposed along the Kern Street side of the structure to re-introduce storefronts along Kern Street. Timing of these improvements is not known.

7. Storm Drain Replacement - The City is replacing the existing storm drain located in the middle of Fulton Mall between Inyo Street and Tuolumne Street.

8. Water Line Replacement - The City is replacing existing water lines within Kern Mall between Federal Alley and Home Run Alley and Mariposa Mall between Federal Alley to Congo Alley.

9. Sewer Line Replacement - The City is replacing existing sewer lines within Kern Mall between Van Ness Avenue and Home Run Alley and within Merced Mall between Van Ness Avenue and Congo Alley.

10. Mariposa Plaza Activation Project - The Mariposa Plaza is proposed to be redesigned to increase the number of community events.

Within the community at large and outside of the Fulton Mall Project Study Area, there are various development projects proposed. These include the following:

11. Van Ness Avenue Pedestrian Crossing at Mariposa Mall - A new signal is proposed along Van Ness Avenue at Mariposa Mall. This pedestrian signal is being funded by the Federal Transit Authority.

12. Bus Rapid Transit Stop - As part of the Bus Rapid Transit program, a bus stop is proposed along Van Ness Avenue at Mariposa Mall. The bus stop is planned to be on a platform in the middle of Van Ness Avenue. Access to the platform would be provided at street level. Funding for this project is being provided by the Federal Transit Authority.

13. High Speed Rail Station - The proposed station is located along the existing Union Pacific railroad tracks between Fresno Street and Tulare Street.

14. Residential Projects - There are numerous other projects proposed or under construction within the community at large, i.e. the Fulton Corridor Specific Plan Area and outside the Fulton Mall Project Study Area. These include, but are not limited to, an approximate 350 total new housing units in various locations in the Cultural Arts District (located north of the Project Study Area) and Chinatown located west of the Project Study Area).

In addition to the development project that are proposed within the community at large, the future development of the FCSP and DNCP will result in a substantial amount of additional development. Both plans are expected to be fully built out by the year 2035. The anticipated development in both plans are shown in Table 2.

Table 2: Development Potential Within FCSP and DNCP

Land Use	Development (in dwelling units, square feet, acres)		
	FCSP	DNCP (Excluding FCSP)	FCSP + DNCP
Residential (units)	6,293	3,697	9,990
Office (sf)	3,900,000	2,000,000	5,900,000
Retail (sf)	1,600,000	350,000	1,950,000
Industrial (sf)	150,000	2,900,000	3,050,000
Open Conservation (acres)	31	33	64
Source: Impact Sciences 2012.			

2.1.2 Environmental Consequences

The implementation of the build alternatives for the proposed Fulton Mall Reconstruction project will result in direct effects to the existing tot lots that are used for public recreation. The two tot lots encompass approximately 1,772 square feet of active play equipment area. Under the Land and Water Conservation Fund Act, this recreational resource must be suitably replaced within three years if the land it occupies is converted to other uses. During the construction period, the removal of this resource would create a temporary adverse effect. The provision of an equal square footage of active play space within the Project Study Area will reduce the long-term effect so that the effect is not adverse. The long-term restoration or replacement of the playground equipment will provide a beneficial recreational effect because all equipment will be functional for the children to use.

No additional existing or planned land uses within the Project Study Area would be directly affected with the implementation of the build alternatives. However, the build alternatives would improve access and parking, resulting in an indirect increase in shoppers and the economic productivity of Fulton Mall. An increase in economic productivity will encourage the reoccupation of the existing vacant ground floor stores and induce the existing businesses and property owners to invest in store upgrades. This indirect growth will result in a beneficial impact on the future land uses within Fulton Mall.

The No Build Alternative would retain the existing land uses including the tot lots and pedestrian mall. Therefore, this alternative would result in no effects on land use.

2.1.3 Avoidance, Minimization, and Mitigation Measures

The implementation of the build alternatives (Alternatives 1 and 2) will result in beneficial land use impacts associated with the proposed tot lot equipment and will not require measures.

The No Build Alternative (Alternative 3) would not affect land use and no avoidance, minimization, or mitigation measures are required.

2.2 Consistency with Federal, State, Regional, and Local Plans

2.2.1 Affected Environment

Various plans and programs are applicable to the proposed project. These applicable plans and programs are listed below.

Transportation Plans

Fresno COG is an association of city and county governments created to address regional transportation issues as well as other regional issues. Its members include the County of Fresno and the 15 incorporated cities within the County.

Fresno COG develops long-term solutions for regional challenges such as transportation, air quality, growth management, hazardous waste management, and air quality. Because these issues cross city and county boundaries, Fresno COG works with cities, counties, and public agencies in the region to develop plans and strategies to address regional issues. The Fresno COG has developed strategies that specifically address the growth and transportation issues facing Southern California as documented in adopted plans including the Regional Transportation Plan (RTP, adopted in 2011), the Federal Transportation Improvement Program (FTIP, adopted in 2012 and 2013), and the Federal Statewide Transportation Improvement Plan (FSTIP, adopted 2012). Following is a discussion of each of these plans and program.

Regional Transportation Plan

Transportation control measures provided by Fresno COG include those contained in the Regional Transportation Plan (RTP), the most current version of which is the 2011 RTP. The 2011 RTP has control measures to reduce emissions from on-road sources by incorporating strategies such as high occupancy vehicle interventions, transit, and information-based technology interventions. The measures implemented by Air Resources Board and Fresno COG affect the Project indirectly by regulating the vehicles that the residents may use and regulating public transportation.

The project is included in the 2011 RTP through 2011 RTP Amendment #2 as Project ID FRE500768. The FHWA and FTA completed review of the conformity determination for the 2011 RTP and found that the document conforms to the applicable state implementation plan in accordance with the provisions of 40 CFR Parts 51 and 93. The FHWA and FTA issued the determination on December 14, 2010. The FHWA and FTA issued a determination of conformity for the 2011 RTP Amendment #2 on December 14, 2012.

Fresno COG is currently circulating the 2014 RTP for informal and early public review and comment. The 2014 RTP, also called the Regional Transportation Plan 2040, charts a 25-year course to the year 2040. The 2014 RTP addresses greenhouse gas emission reductions and other air emissions with a goal of sustainable planning.

Federal Statewide Transportation Improvement Plan

The Federal Statewide Transportation Improvements Plan (FSTIP) covers a four-year period from 2012/2013 through 2015/2016, which includes the listings of proposed transportation projects in the rural non MPO areas of the sate, and incorporates by reference projects listed in the MPO's 2013 FTIPs. Fresno COG submitted their board-approved 2013 FTIP to Caltrans, including 2013 FTIP Amendment #1 made August 2012. The FSTIP was transmitted from Caltrans to FHWA on November 5, 2012. The FHWA and FTA completed review of California's 2013 FSTIP, and approved the document as proposed. The FHWA and FTA determined the 2013 FSTIP conforms to the SIP on December 14, 2012. The 2013 FSTIP incorporated by reference those projects included in the 2012/2013 Federal Transportation Improvement Programs (FTIP) adopted by the MPOs in California. This conformity determination includes Fresno COG 2013 FTIP Amendment #1, which lists the project.

Federal Transportation Improvement Plan

The FTIP is a compilation of project lists from the State Transportation Improvement Program (STIP), urbanized and non-urbanized areas, and other programs using federal funding. The 2013 FTIP is composed of two parts. The first is a priority list of projects and project segments to be carried out in a four-year period. The second is a financial plan that demonstrates how the TIP can be implemented. The project was included in the 2013 FTIP Appendix F, Regional Transportation Plan Project Listing 2011 through 2035, as RTP ID FRE500768. The project was also included in 2013 FTIP Amendment #1, dated August 2012, as Project ID FRE130069. Since the 2013 FSTIP incorporated by reference those projects included in the 2012/2013 Federal Transportation Improvement

Programs (FTIP) adopted by the MPOs in California, this conformity determination includes Fresno COG 2013 FTIP Amendment #1, which lists the project.

City of Fresno 2025 General Plan

The City of Fresno 2025 General Plan was adopted in 2002 and currently serves as a guide to enable government at all levels, private enterprise, community groups, and individual citizens to make decisions and utilize community resources in a manner that will realize progress toward a common vision of a measurably enhanced physical, economic, and social environment.

Following are the applicable goals and policies of the City of Fresno 2025 General Plan which are included in the Public Facilities Element.

Policy E-1-a: Implement the following classified street system in accordance with adopted engineering design standards and the 2025 Fresno General Plan Land Use and Circulation Map (Exhibit 4) and the Transportation (Streets and Highways) Element Map (Exhibit 7) adopted and incorporated herein depicting the location and general alignment of streets and highways.

Policy E-1-f: Allow a Level of Service "D" ("LOS D") as the acceptable level of traffic congestion on major streets. LOS "D" according to the Caltrans and COFCG accepted LOS criteria, as developed by the Florida Department of Transportation, means moderate congestion at peak traffic periods; approaching unstable flow with reduced speeds, limited maneuverability, and loss of convenience; average speeds range from 9 to 17 miles per hour on arterials with stopped delays of 40 seconds or less.

Policy E-2-h: Limit the number of driveway access points on all major streets to minimize traffic disruption and protect traffic flows. No development shall be approved if it will adversely affect the flow of traffic on a public street below an acceptable standard to be determined by the Public Works Director and based upon the policies noted herein.

City of Fresno Draft General Plan Update

The City of Fresno has prepared and made available for public review a comprehensive update to its General Plan, which is anticipated to be adopted in 2014. The update provides a policy direction for the long-term development and maintenance of the City. It provides guidance to decision-makers when making determinations about the allocation of resources and the future physical form and character of development in the City. The

land uses and circulation system within the General Plan Update are consistent with the proposed land uses and circulation system proposed in the Downtown Neighborhoods Community Plan (DNCP) and Fulton Corridor Specific Plan (FCSP). The General Plan Update proposes that the Downtown planning area would be further refined through specific and community plans, such as the proposed DNCP and FCSP, and further implemented through updates to the Development Code for regulations specific to the Downtown. The goals within the DNCP and FCSP are beingproposed as objectives within the General Plan Update to ensure consistency between the General Plan Update and the DNCP and FCSP.

The following proposed policies from the Fresno General Plan Update are applicable to the proposed project.

Goal MT-1 Create and maintain a transportation system that is safe, efficient, provides access in an equitable manner, and optimizes travel by all modes.

Policy MT-1-h"Complete Streets" Concept Implementation. Provide transportation facilities upon a "Complete Streets" concept that facilitates and balanced use of all travel modes (pedestrians, bicyclists, motorists, and transit users), meeting the transportation needs of all ages and abilities and providing mobility for a variety of trip purposes. Implementation actions will include:

- Meeting the needs of all users within the street system as a whole; each individual street does not need to provide all modes of travel, but travel by all modes must be accommodated throughout the planning area;
- Continuing to adopt refined street cross-section standards as appropriate in response to needs identified;
- Considering the impact of streets on public health by addressing storm water runoff quality, air quality, and water conservation among other factors; and
- Adhering to the City's Water Efficient Landscape Ordinance for median and streetscape plantings and irrigation methods.

Policy UF-11 Revitalize the Fulton Mall.

Central Area Community Plan

The Central Area Community Plan was approved in 1989 and encompasses approximately 1,500 acres bound by Highway 99, Highway 41 and Highway 180. The Community Plan provides a tool for the future development of the planning area.

Following are the goal and policies of the Community Plan that are applicable to the proposed project.

Fulton Mall District Goal: Retain the Fulton Mall as a multifunctional, primarily pedestrian environment and improve its physical condition and economic vitality as a District with strong linkages to other Central Area activity centers; and promote the image of this District as a high quality, unique, comfortable and secure area which is accessible and attractive for business, recreation, tourism and a variety of special activities.

Essential to this setting is proximity of significant and attractive housing opportunities within the Central Area, and an environment reflective of the community's appreciation for its cultural diversity and historic importance.

Fulton Mall District Policy 1: Enhance linkage between the Fulton Mall District and other Central Area districts to strengthen interaction between them. Improve vehicular and pedestrian circulation around and access within the Fulton Mall District to optimize public convenience and safety, consistent with high standards of aesthetic quality.

Fulton Mall District Policy 2: Reinforce the emerging "three-node pattern: of retail, service and office activities with the north node principally as a public/private urban office park; the central node, as a blend of specialty shops, private and government offices; and south node, mainly as a diverse mix of unique retail shopping and services which cater to Central Area employees, residents, tourists and shoppers.

Fulton Mall District Policy 4: Improve the appearance of public and private property through measures that result in a high level of maintenance.

Fulton Mall District Policy 5: Encourage the redesign and remodeling of functionally obsolete office and retail business buildings to accommodate new uses that will stimulate activity along Fulton Mall network.

Fulton Mall District Policy 6: Establish and maintain an environment characterized by enhanced security, public convenience, easy access and orientation.

Fulton Mall District Policy 8: Improve and maintain the Fulton Mall as an exciting, physically and visually superior pedestrian environment for the people of Fresno, the San Joaquin Valley and the world.

Draft Downtown Neighborhood Communities Plan

The City of Fresno has prepared and made available for public review the draft Downtown Neighborhoods Community Plan (DNCP), which is anticipated to be adopted in early 2014. If adopted, the DNCP would be the community's tool for guiding the successful regeneration of Downtown Fresno and its surrounding neighborhoods. The Plan provides long-term goals for the Plan Area and detailed policies concerning a wide range of topics, including land use and development, transportation, the public realm of streets and parks, infrastructure, historic resources, and health and wellness. The project site is located near the center of the DNCP, which encompasses 7,290 acres.

Following are the applicable goals and policies of the draft DNCP.

Goal 3.3 Create a network of complete streets and multi-modal transportation strategies.

Policy 3.3.1 Create "complete streets" in the Downtown Neighborhoods so that all streets accommodate the needs of all potential users - vehicles, pedestrians, cyclists, transits vehicles and freight.

Policy 3.3.6 Prioritize space for pedestrians and bicycles in the design and improvement of public right-of-way. As part of the implementation of this policy, design new roadways or retrofit existing roadways to have wider sidewalks and/or an improved pedestrian-oriented streetscape.

Policy 3.3.8 In order to decrease conflicts between automobiles and pedestrians, consolidate existing and minimize new curb cuts and driveways throughout the Plan Area.

Goal 3.4 Physically improve the Downtown Neighborhoods' roadways and manage the transportation system to enhance safety and quality of life.

Policy 3.4.3 Reestablish an interconnected street grid comparable to Fresno's original grid pattern in order to increase walkability and improve connections to parks, open space, schools, and neighborhood centers.

Draft Fulton Corridor Specific Plan

The City of Fresno has prepared and made available for public review the draft Fulton corridor Specific Plan (FCSP), which is anticipated to be adopted in early 2014. If adopted, the FCSP would be the community's tool for guiding the future development of Downtown Fresno. The Plan provides long-term goals for the FCSP area and detailed

policies concerning a wide range of topics, including land use and development, historic resources, the public realm, transportation, and infrastructure. The project site is located near the center of the FCSP, which encompasses 655 acres. The FCSP is located within the DNCP.

Following are the applicable goals and policies of the draft FCSP.

Goal 9-1 Provide a comprehensive transportation, circulation, and parking system that improves quality of life in Downtown.

Policy 9-1-2 Design new roadways or retrofit existing roadways to have wider sidewalks and a pedestrian-oriented streetscape.

Policy 9-1-4 Along Commercial and mixed-use streets, minimize driveways and driveway crossings of the pedestrian right-of-way.

Policy 9-1-6 Install new or retain existing on-street parking (parallel or angles) along all streets, except where precluded by lack of curb-side access or right-of-way. The type of parking shall depend on the adjacent land use and roadway classification.

Policy 9-1-12 Reestablish an interconnected street grid comparable to Fresno's original grid pattern in order to increase walkability and improve connections to parks, open space, schools, and neighborhood centers.

Goal 9-4 Make parking convenient and easy to find.

2.2.2 Environmental Consequences

Transportation Plans

Regional Transportation Plan

The Project was included in the regional emissions analysis conducted by Fresno COG for the conforming 2011 Regional Transportation Plan (2011 RTP), under the RTP ID FRE500768, as identified in the 2011 RTP Amendment #2. The description of RTP ID FRE500768 in the RTP projects list is:

> In the City of Fresno, at 4 locations; reintroduce 2-lane undivided complete streets.
>
> 1) Fulton Mall between Tuolumne and Inyo Streets
> 2) Merced Mall from Congo Alley to Federal Alley
> 3) Mariposa Mall from Broadway Street to Federal Alley

4) Kern Mall from Fulton Mall to Federal Alley

FHWA determined the 2011 RTP conforms to the SIP on December 14, 2010. This analysis found that the 2011 RTP and, therefore, the individual projects contained in the 2011 RTP, are conforming projects, and will have air quality impacts consistent with those identified in the state implementation plans for achieving the NAAQS.

The 2011 RTP Amendment #2 was adopted by Fresno COG and the 2011 RTP Amendment #2 conformity was approved by FHWA on December 14, 2012. The Project's design concept and scope have not changed significantly from what was analyzed in the 2011 RTP Amendment #2. Therefore, the Project is consistent with Amendment #2 of the 2011 RTP.

Federal Statewide Transportation Improvement Plan

The FHWA and FTA completed review of California's 2013 FSTIP, and approved the document as proposed. The FHWA and FTA determined the 2013 FSTIP conforms to the SIP on December 14, 2012. Therefore, the proposed project is consistent with the Federal Statewide Transportation Improvement Plan.

Federal Transportation Improvement Plan

The 2013 FSTIP incorporated by reference those projects included in the 2012/2013 Federal Transportation Improvement Programs (FTIP) adopted by the MPOs in California. This conformity determination includes Fresno COG 2013 FTIP Amendment #1, which lists the project. Therefore, the proposed project is consistent with the Federal Transportation Improvement Plan.

City of Fresno 2025 General Plan

The proposed project has been evaluated for its consistency with the 2025 General Plan goals and policies because the 2025 General Plan is the currently adopted plan for the City. Alternatives 1 and 2 propose to reclassify the rights-of-way within Fulton Mall between Tuolumne Street and Inyo Street to a Collector street. This reclassification is not consistent with Policy E-1-a of the Public Facilities Element because this policy makes reference to the 2025 General Plan Circulation Element Map which does not identify the rights-of-way within Fulton Mall as a major street.

Policy E-1-f discusses the LOS D policy for roadways. The implementation of Alternatives 1 and 2 will result in the redistribution of existing traffic. Under the existing

plus project scenario, the surrounding intersections would operate at LOS D or better after the redistribution of existing traffic volumes. In the existing plus project plus cumulative scenario, there will be two intersections where the project would contribute to an exceedance of the LOS D policy in the year 2035. Both Alternatives 1 and 2 would not be consistent with Policy E-1-f .

Policy E-2-h includes the limitation of driveway access points on all major streets. The Fulton Mall rights-of-way are not designated as a major street on the City's Circulation Element Map. However, the proposed project would result in the re-classification of the Fulton Mall as a Collector street. Alternatives 1 and 2 doe not include the addition of driveway access points on the proposed streets, and therefore, both of these alternatives would be consistent with Policy E-2-h.

City of Fresno 2035 draft General Plan Update

The proposed project has been evaluated for its consistency with the draft General Plan Update goals and policies because this plan is anticipated to be adopted in 2014 Alternatives 1 and 2 propose to reconstruct Fulton Mall using "complete streets" design concepts, which would be consistent with Policy MT-1-h in the General Plan Update. In addition, both alternatives would be consistent with Policy UF-11, which proposes to revitalize the Fulton Mall.

Central Area Community Plan

The Fulton Mall District Goal included in the Central Area Community Plan identifies retention of Fulton Mall as a multifunctional, primarily pedestrian environment. Both Alternatives 1 and 2 would not be consistent with the key premise of maintaining the mall as a pedestrian-only environment. The Fulton Mall District Goal also includes improvement of its physical condition and economic vitality. The implementation of Alternatives 1 and 2 would indirectly increase the economic productivity of Fulton Mall, and therefore, would be consistent with this portion of the Goal. Alternatives 1 and 2 would improve vehicular circulation around and access within the Fulton Mall District, and as a result would be consistent with Fulton Mall District Policy 1. Both alternatives would also result in long-term improvement in the aesthetic appearance by removing the dirty, stained, and cracked pavement, the cracked and stained planters, and the inoperable fountains. The alternatives would include new pavement for the sidewalks, refurbish the sculptures, and provide new lighting systems. The improvements under Alternatives 1 and 2 would improve the appearance of the publicly-owned Fulton Mall and be consistent with Fulton Mall District Policy 4.

Alternatives 1 and 2 would provide streets that would increase access to the area. This increase in access is anticipated to influence growth within the Fulton Mall District. This growth is anticipated to occur through the reoccupation of the ground floors of existing vacant buildings as vehicle access and parking become available. As a result, both alternatives would stimulate activity along the Fulton Mall network and would be consistent with Fulton Mall District Policy 5.

The enhancement of security, public convenience, easy access and orientation that are identified in Fulton Mall District Policy 6 are desired elements in the implementation of Alternatives 1 and 2. The provision of streets under both alternatives would increase access and convenience to shop within Fulton Mall. The streets would also allow motorists improved orientation to specific destinations within Fulton Mall. Therefore, Alternatives 1 and 2 would be consistent with Fulton Mall Policy 6.

Fulton Mall District Policy 8 identifies the retention of Fulton Mall as an exciting, physically, and visually superior pedestrian environment. The introduction of streets under Alternatives 1 and 2 would result in a shared environment between pedestrians and motorists. As a result, Alternatives 1 and 2 would not be consistent with Fulton Mall district Policy 8.

Draft Downtown Neighborhood Communities Plan

The proposed project has been evaluated for its consistency with the draft DNCP goals and policies because the City anticipates adopting the DNCP in 2014. There are various goals and policies of the DNCP that are relevant to the proposed project. The DNCP identifies the creation of “complete streets” in Goal 3.3 and Policy 3.3.1. Alternatives 1 and 2 include the reconstruction of Fulton Mall using “complete streets,” and therefore, these alternatives would be consistent with the goal and policy. In addition, the DNCP includes policies to prioritize space for pedestrians in the improvement of the public right-of-way (Policy 3.3.6) and decrease conflicts between automobiles and pedestrians by minimizing new curb cuts and driveways (Policy 3.3.8), Alternatives 1 and 2 would be consistent with both of these policies because these alternatives will include sidewalks for pedestrians and no new curb cuts or driveways are proposed. Therefore, Alternatives 1 and 2 would be consistent with Policy 3.3.6 and Policy 3.3.8. The DNCP also has a goal and policy related to enhancing safety and quality of life and reestablishing an interconnected street grid comparable to Fresno’s original grid pattern. Both Alternative 1 and 2 would include sidewalks and curbs so vehicular and bicycle traffic is separated from pedestrian traffic. In addition, both alternatives include new streets along Fulton

Mall, Kern Mall, Mariposa Mall, and Merced Mall and would reestablish the original street grid. Therefore, both alternatives would be consistent with Goal 3.4 and Policy 3.4.3.

Draft Fulton Corridor Specific Plan

There are also various goals and policies of the draft FCSP that are relevant to the proposed project. The FCSP identifies the provision of a transportation, circulation, and parking system that improves the quality of life in Downtown in Goal 9-1. Both Alternatives 1 and 2 would provide streets within Fulton Mall and increase the number of shoppers within the Mall. The increase in shoppers will increase the number of "eyes" within the Mall and deter crime-related activities, and therefore, improve the quality of life in the Mall. Both alternatives would be consistent with Goal 9-1. The DNCP also includes the provision of pedestrian-oriented streetscapes (Policy 9-1-2), minimization of driveways and driveway crossing (Policy 9-1-4), and installation of on-street parking. Alternatives 1 and 2 are consistent with these policies because both alternatives provide streetscapes that include trees, benches, sculptures and other artwork within the sidewalk areas. In addition, both alternatives do not include any driveways or driveway crossings. Furthermore, both alternatives include on-street parking to allow shoppers to park near their retail store destination. The FCSP also includes a similar policy as the DNCP related to the reestablishment of an interconnected street grid (Policy 9-1-12). Both Alternatives 1 and 2 will be consistent with Policy 9-1-12). Finally, the FCSP includes a goal (Goal 9-4) to make parking more convenient and easy to find. The provision of on-street parking adjacent to the retail stores will make parking easier to find. Therefore, both alternatives would be consistent with Goal 9-4.

The No Build Alternative (Alternative 3) would retain the existing pedestrian mall in its current state. The retention of the pedestrian mall would not conflict with the goals and policies of the City's plans and programs. Alternative 3 would not be consistent with the transportation plans; however, this inconsistency would not result in substantial effects because this alternative would retain the existing pedestrian mall.

2.2.3 Avoidance, Minimization, and Mitigation Measures

Alternatives 1 and 2 would be consistent with the various transportation plans, as well as the goals and policies of the City of Fresno draft 2035 General Plan Update, the draft DNCP, and the draft FCSP. Alternatives 1 and 2 would not be consistent with elements of the 2025 General Plan and Central Area Community Plan. Narrative changes, as specified below, would be required mitigation measures.

2025 General Plan

Policy E-1-a: An amendment to the Circulation Element Map would be required to specify to reclassify the rights-of-way within Fulton Mall between Tuolumne Street and Inyo Street to a Collector street.

Policy E-1-f: Mitigation identified in the Supplemental Traffic Impact Report would be implemented to improve the intersections so that the project's contribution to the exceedance of LOS D at two intersections would be reduced.

Central Area Community Plan

Fulton Mall District Goal: An amendment to the Circulation Element Map of the 2025 General Plan would be required for Alternatives 1 and 2 to reclassify the Fulton Mall from a pedestrian-oriented facility to a collector street.

Fulton Mall District Policy 8: Narrative changes to the Plan would need to be provided to re-classify the Mall from a pedestrian-only environment to a collector street. The No Build Alternative (Alternative 3) would result in no adverse impacts to transportation and land use plans. No avoidance, minimization, or mitigation measures are required as part of the No Build Alternative.

2.3 Park and Recreation

2.3.1 Affected Environment

The City of Fresno currently has a mix of regional, community, neighborhood, pocket, and mini parks within the city limits. A limited number of parks are provided in the downtown area. There are two parks, Courthouse Park and Densmore Skate Park that are located within the 655-acre FCSP. No parks are located within the Project Study Area. There are two recreational areas for children within Fulton Mall. These areas are tot lots with playground equipment and sand areas. One of the tot lots is located within Fulton Mall immediately north of Kern Mall and encompasses 966 sf of active play equipment area. The second tot lot is also within Fulton Mall immediately south of Merced Mall and encompasses 806 sf of active play equipment area. Today most, though not all, of this equipment remains functional for the children to use.

2.3.2 Environmental Consequences

The implementation of the build alternatives for the proposed Fulton Mall Reconstruction project will result in direct effects to the existing tot lots that are used for public recreation. The two tot lots encompass approximately 1,772 square feet of active play

equipment area. Alternatives 1 and 2 would result in the relocation of the tot lots and they will be consolidated into one larger tot lot within the Project Study Area at the Fresno County Economic Opportunities Commission campus near the intersection of Mariposa and Congo Alley. During the construction period, the removal of this resource would create a temporary adverse effect. The provision of an equal square footage of active play space within the Project Study Area will reduce the long-term effect so that the effect is not adverse. The long-term restoration or replacement of the playground equipment will provide a beneficial recreational effect because all equipment will be functional for the children to use.

The No Build Alternative would retain the existing land uses including the tot lots and pedestrian mall. Therefore, this alternative would result in no effects on parks and recreation.

2.3.3 Avoidance, Minimization, and Mitigation Measures

Alternatives 1 and 2 will result in beneficial land use impacts associated with the proposed tot lot equipment and will not require measures.

The No Build Alternative (Alternative 3) would not affect parks and recreational facilities and no avoidance, minimization, or mitigation measures are required.

Chapter 3 Growth

3.1 Affected Environment

The Fulton Mall is limited to pedestrian traffic. This limitation has resulted in businesses within the Project Study Area grossly under-performing and storefronts having a high vacancy rate. There is a lack of convenient parking spaces in front of stores, and no visibility for drive-by vehicular traffic. Parking is located around the perimeter of the study area; however, due to the broken street grid, motorists find it confusing to navigate to a parking area and then navigate to the businesses and stores by foot. There is no clear view into the Mall area from its ends, and the landscape largely blocks views of the storefronts.

The underperformance of the Fulton Mall has occurred for many years. Starting around 1970, business in Downtown Fresno began to decline due to increasingly rapid growth in the northern parts of the City and the opening of the major suburban shopping mall, Fashion Fair. This caused department stores within the Project Study Area to leave Downtown Fresno. The opening of additional shopping malls within the City resulted in further declines in economic activity in Downtown.

The Project Study Area became an area of low levels of retail and other economic activity. In fact, urban decay data show that challenges in lease and vacancy rates are several times more severe on the Fulton Mall than in the rest of Downtown, compared with citywide and regional averages. The Project Study Area is devoid of any significant activity on weeknights after 5 pm when workers leave Downtown.

Numerous efforts are underway to address this problem. In 2010, property owners voted to create an assessment district, which is today managed by the Downtown Fresno Partnership. This district, which is centered on Fulton Mall, funds promotions, events, and advocacy on behalf of the area. The City is also undertaking a wholesale rewrite of its land use plans and zoning codes that govern the downtown, in order to encourage investment and development in Downtown and healthy, mixed-income neighborhoods in the surrounding 7,290 acres.

3.2 Environmental Consequences

Although the proposed project does not include additional land uses within the Project Study Area, the provision of streets will increase access to the area. This increase in access is anticipated to influence growth within the Project Study Area. This growth is

anticipated to occur through the reoccupation of the ground floors of existing vacant buildings as vehicle access and parking become available. This cause-and-effect relationship is bolstered by letters received from two Fulton Mall property owners and developers who recently acquired major historic buildings in support of a City application for funding related to the Fulton Mall Reconstruction Project. The owner of the JC Penney building, who is planning the creation of 66 housing units, wrote that "like any development project…access to and around the property is of utmost concern to me in making this kind of investment" (Maghame 2012). The owner of the Pacific Southwest and Helm Buildings, who is planning to develop a mix of housing, office, and entertainment space, wrote that "addressing the access and infrastructure issues surrounding my properties…is my main source of hesitation about investing in housing units there" (Khatchadourian, 2012).

This reoccupation is considered a beneficial impact on the existing land uses within the Project Study Area because additional tenants and customers are expected to increase the economic productivity of the Project Study Area. Following is a discussion of the proposed project's influence of growth under each alternative.

Alternative 1 - Based on the Economic Impact Analysis for the Fulton Mall Alternative Plans prepared in June 2011, the reopening of Fulton Street and adding on-street parking is anticipated to reduce the existing ground floor vacancies from 26 percent to nine percent, close to citywide levels. The reoccupation would represent leasing approximately 79,200 sf of the existing 122,700 sf of vacant ground floor space. Assuming sales only at the present-day rate in the Study Area of $78.88 per sf per year, the new occupancy would generate $6.25 million in annual sales. Nearly all of the sales tax which would be $513,840 per year would accrue to the City of Fresno.

Alternative 2 - Based on the Economic Impact Analysis prepared in June 2011, the reopening of Fulton Street and adding fewer on-street parking spaces compared to Alternative 1 is anticipated to reduce the existing ground floor vacancies from 26 percent to 15 percent. The reoccupation would represent leasing approximately 51,900 sf of retail space of the existing 122,700 sf of vacant ground floor space. Assuming sales only at the present-day rate in the Study Area of $78.88 per sf per year, the new occupancy would generate $4.09 million in annual sales. The annual sales tax generated from the annual sales would be $336,721 per year.

Alternative 3 - Based on the Economic Impact Analysis prepared in June 2011, the retention of the existing pedestrian mall is anticipated to increase existing ground floor

vacancies from 26 percent to 35 percent, which represents an increase of approximately 44,600 sf of vacancies. Assuming sales at the present-day rate in the Study Area of $78.88 per sf per year, this represents a loss of $3.52 million in annual sales and a reduction in annual sales tax revenue of $289,359 per year.

Interest in developing in Downtown Fresno overall has been on the rise for several years. The City's General Plan Update encourages even more infill development to account for an even greater portion of the city's overall growth in coming years. The Fulton Corridor Specific Plan attempts to respond to — and propel — this trend by implementing a new zoning code that is more appropriate to a developed urban area. The Fulton Mall Reconstruction Project fits with this effort, by making the most densely built part of the Downtown more accessible and therefore ripe for development of housing and other uses. Because the density along the Fulton Mall is so much greater than other areas, activity in the Study Area fuels itself, and the increases in economic productivity expected to occur as a result of implementing the build alternatives are therefore substantial.

Construction activities associated with the reoccupation of the vacant buildings is not expected to result in a substantial increase in noise. Furthermore, two of the three locations with existing noise sensitive land uses (i.e., the Masten Towers and Hotel Californian residential complexes) are not located directly adjacent to the portion of the malls proposed for construction of street improvements. A third location, the Pacific Southwest Building is located directly adjacent to the proposed street improvements; however, the existing residences that are located within this building are located in the upper floors (above the tenth floor) of the 16-story building. Therefore, construction activities would not result in adverse noise effects on these residences.

3.3 Avoidance, Minimization, and Mitigation Measures

The implementation of the build alternatives (Alternatives 1 and 2) will influence growth in the Project Study Area, in conjunction with other City plans and projects, and this growth is expected to result in a beneficial effect on the economic activity for the Project Study Area and would not result in adverse environmental effects. No mitigation measure will be required.

The No Build Alternative (Alternative 3) is anticipated to result in negative growth by increasing ground floor vacancies within the Project Study Area. No avoidance, minimization, or mitigation measures are assumed as part of the No Build Alternative.

Chapter 4 Community Character

4.1 Population and Housing

4.1.1 Affected Environment

Regional Population Characteristics/Community Character

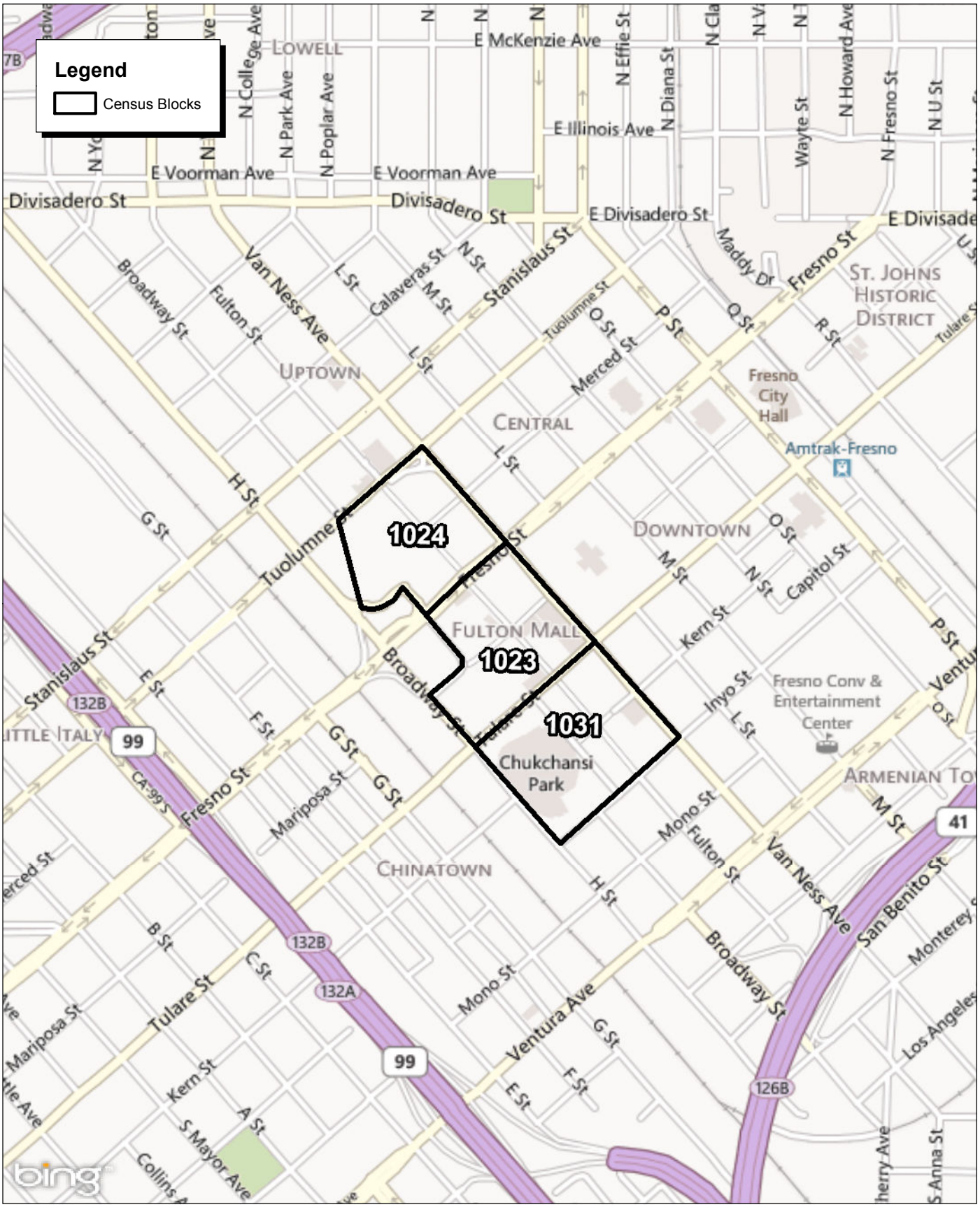
As of 2010, the City of Fresno had a population of 494,665 persons, as reported by the 2010 U.S. Census Bureau. Since 2000, the City of Fresno added 67,000 new residents, a 15.7 percent increase. Fresno County had a 2010 population of 930,450, growing approximately 16 percent since 2000.

The City's race characteristics are provided in Table 3 in Section 4.1.1.2 below. As shown, whites are the dominant race within the City while people with a Hispanic origin are the dominant ethnicity within the City.

The median household income in the City of Fresno was $43,440 (U.S. Census Bureau, May 2013) and within the County of Fresno was $46,903 (U.S. Census Bureau, July 2013). Per capita incomes are $19,978 (U.S. Census Bureau, May 2013) and $20,638 (U.S. Census Bureau, July 2013), respectively. These incomes are between 24 percent and 33 percent lower than the California median income of $61,632 (U.S. Census Bureau, July 2013) and the per capita income of $29,634 (U.S. Census Bureau, May 2013).

Neighborhoods/Communities/Community Character

The Project Study Area is made up of three census blocks (1023, 1024, and 1031) within Census Tract 1 (Figures 4-1 and 4-2). Tract 1 contains a total of 22 blocks. These three census blocks are primarily comprised of commercial and office uses, and there are three locations with residential uses within these three blocks. Due to lack of information at the census block level, there may be additional housing within the project area that is unknown at this time.



Source: ESRI Bing base map.

NORTH

1,000 500 0 1,000 Feet

Michael Brandman Associates

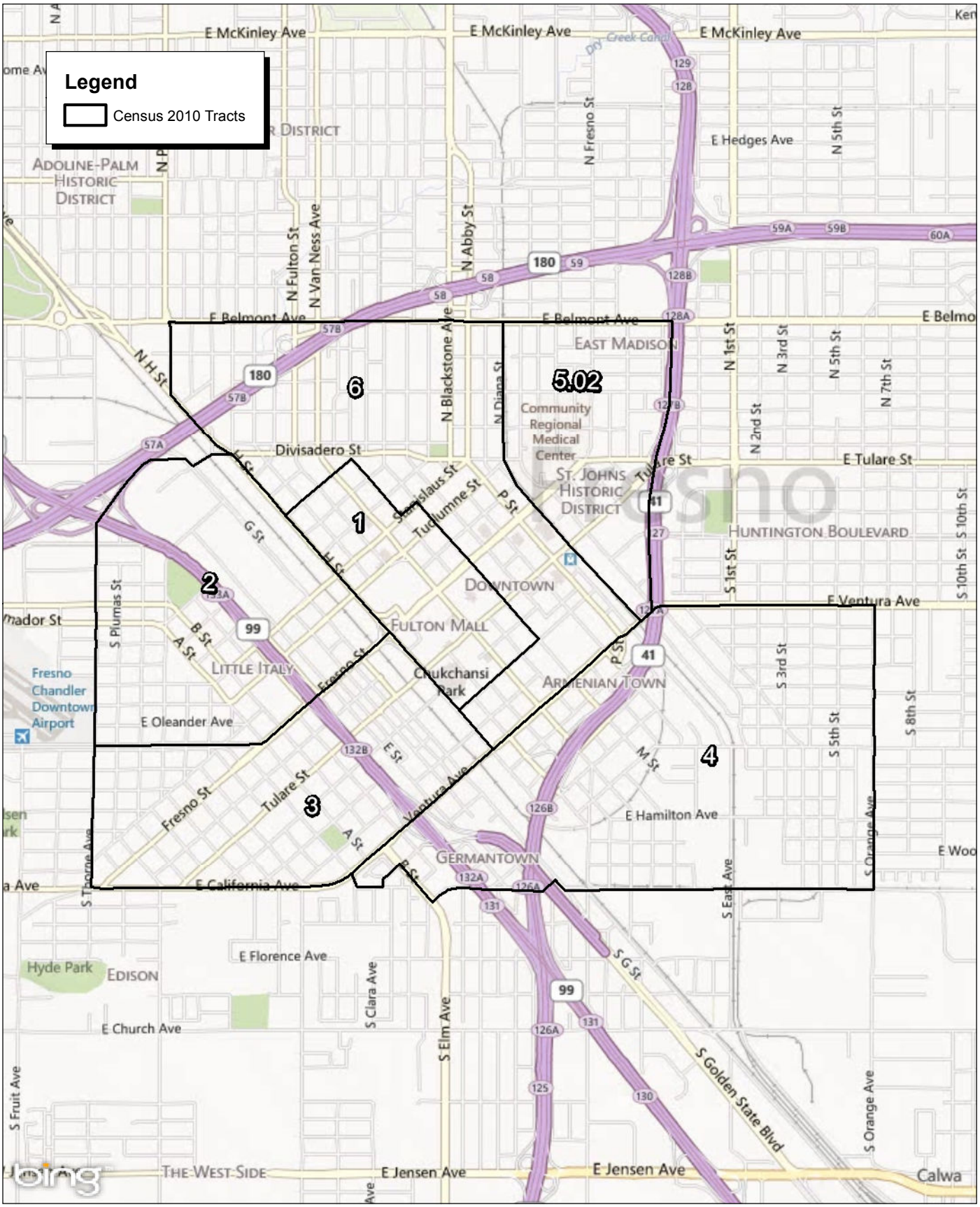
31680017 • 06/2013 | Fig_1-4_project_site_census_blocks.mxd

Figure 4-1
Project Study Area - Census Blocks

Population and ethnic census data was only available at the tract level for 2010. Table 3 compares the ethnicity within Tract 1 that encompasses the Project Study Area with five other tracts that surround it as well as with the City of Fresno. Figure 4-2 shows the location of the census tracts. The Hispanic/Non-Hispanic population is also compared. Tract 1 has a much higher percentage of White population at 73.4 percent than for other tracts in the area (26.6 to 44.9 percent) or the City of Fresno at 49.6 percent. This may represent an anomaly because of the smaller population size, or it may reflect the contributing factors of an "urban pioneer" demographic that is more heavily White, living in the northern part of the tract, combined with a population in the large apartment facilities within the Study Area comprised mostly of seniors which does not reflect the young Hispanic population boom seen in the region as a whole. Tract 1 has a higher percentage of Black population (16.6 percent) than three of the other tracts (Tracts 4, 5.02, and 6 that range from 6.3 to 7.4 percent) and the City of Fresno (8.3 percent). Tracts 2 and 3 have higher percentages of Black population (19.3 and 26.6 percent respectively). While Tract 1 had a similar Asian population to nearby census tracts, it was much lower than for the City of Fresno at 4.5 percent vs. 12.6 percent. For other races, percentages were similar.

Tract 1 has a higher (55.7 percent) percentage of Hispanic residents than the City as a whole (46.9 percent), but this was a lower percent than for the surrounding tracts (62.8 to 78.0 percent).

Table 4 shows the poverty status for the six census tracts and the City of Fresno. Information about non-family households was included because Tract 1 has a very low number of family households and information included can help give a clear picture of the area. Of the 420 households found in Tract 1, 403 are reported as non-family households. As discussed below, most people living in the project area reside in apartments that are for seniors or disabled persons. In this type of housing few, if any, families would be living in these apartments except for some couples. As shown on the table, non-family households have a median income of $11,243. Overall, there is a per capita income of just $8,368, less than half of that for the City. The Department of Health and Human Services poverty guidelines for 2010 was $10,830 for one person and $22,050 for a family of four. Both figures have been included here because the majority of the project area and Tract 1 appear to be made up of mostly single persons living alone as indicated on Table 4 and the information given by the apartment complexes. As indicated on the table, most of the tract, and thus the project area, is considered to be low-income. Tract 2 appears to have a worse rate of poverty than Tract 1.



Source: ESRI Bing base map.

NORTH

2,500 1,250 0 2,500 Feet

Michael Brandman Associates

31680017 • 06/2013 | Fig_4-2_project_vicinity_census_tracts.mxd

Figure 4-2
Project Vicinity - Census Tracts

Personal interviews with apartment managers provided an estimated population for the three census blocks where the project is located and some information about income. The apartment complexes are:

Pacific Southwest Building: 8 units with about 12 residents. None are low-income.

Hotel Californian: 217 units with about 250 residents who are very low to low-income senior citizens or disabled.

Masten Towers: 200 units with about 204 residents who are very low to low-income (qualify for Section 8 housing). 85 percent are seniors over age 62 and the rest are under 62 with mobility impairments.

The estimated population within the project area is 466. Of these, it is anticipated that 454 are very low to low-income. At Masten Towers, residents must qualify for Section 8 housing meaning that they must be low-income according to Fresno County. This may be a somewhat different standard than the Department of Health and Human Services poverty guidelines, but would still be similar. Many residents at the Hotel Californian rely on income from Social Security Supplemental Security Income (SSI) or military pensions.

A Fulton Mall Pedestrian Count Project was conducted in 2010. The number of pedestrians in the Mall were surveyed based on the number of pedestrians crossing Mariposa Plaza near the Clock Tower. The total number of pedestrians for each of the three days that were surveyed included 4,673 people on a Tuesday, 5,511 people on a Wednesday, and 5,071 people on a Saturday. The people that were counted each day were categorized as pedestrians, bicyclists, and other. There were various purposes for the trips for each person. These purposes included shopping/doing errands, work commute, recreation, personal business, exercising, and school, and other. It was also found that fewer Caucasians and Asians were present on the Mall as compared to the Fresno County population, and African Americans and Hispanics were present in greater numbers as compared to county population.

A substantial homeless or transient population is currently found on the Fulton Mall, particularly at night, when it can seem to be the only human presence.

Table 3: Population and Race

Tract or area	Total Population	Population and (Percentage of Total Population)							
		White	Black	Amer. Indian/ Alaska Native	Asian	Native Hawaiian/ Other Pac. Islander	Some Other Race	Hispanic [1]	Non-Hispanic
1	2,860	2,099 (73.4)	474 (16.6)	36 (1.3)	130 (4.5)	2 (0.1)	91 (3.2)	1,594 (55.7)	1,266 (44.3)
2	3,167	850 (26.8)	612 (19.3)	72 (2.3)	315 (9.9)	1 (0.0)	1,167 (36.8)	2,013 (63.6)	1,154 (36.4)
3	3,609	960 (26.6)	959 (26.6)	78 (2.2)	213 (5.9)	7 (0.2)	1,257 (34.8)	2,266 (62.8)	1,343 (37.2
4	6,343	2,848 (44.9)	425 (6.7)	175 (2.8)	355 (5.6)	4 (0.1)	2,255 (35.6)	4,948 (78.0)	1,395 (22.0)
5.02	3,606	1,440 (39.9)	227 (6.3)	116 (3.2)	261 (7.2)	3 (0.1)	1,390 (38.5)	2,577 (71.5)	1,029 (28.5)
6	6,161	2,610 (42.4)	455 (7.4)	111 (1.8)	279 (4.5)	12 (0.2)	2,361 (38.3)	4,360 (70.8)	1,801 (29.2)
City of Fresno	494,665	245,306 (49.6)	40,960 (8.3)	8,525 (1.7)	62,528 (12.6)	849 (0.2)	111,984 (22.6)	232,055 (46.9)	262,610 (53.1)

Source: 2010 Census

1. Hispanic may be of any race.

Table 4: Poverty Status (Income)

	Tract 1	Tract 2	Tract 3	Tract 4	Tract 5.02	Tract 6	City of Fresno
Total households	420	812	1,006	1,259	964	1,731	156,724
$14,999 or less	318 (75.7%)	438 (53.9%)	301 (29.9%)	224 (17.8%)	282 (29.2%)	705 (40.8%)	25,772 (16.4%)
$15,000 to $24,000	65 (15.5%)	183 (22.5%)	273 (27.1%)	264 (21.0%)	128 (13.3%)	417 (24.1%)	21,885 (14.0%)
$25,000 to $150,000	37 (8.8%)	191(23.5%)	423 (42.1%)	734 (58.2%)	509 (52.9%)	609 (35.2%)	99,709 (63.6%)
Median household income	$11,303	$13,596	$22,245	$31,494	$33,438	$20,148	$43,440
Family House-holds	17	581	756	1,001	613	840	108,221
$14,999 or less	8 (47.1%)	303 (52.1%)[1]	156 (20.6%)	170 (17.0%)	247 (40.3%)	265 (31.6%)	14,845 (13.7%)
$15,000 to $24,000	9 (52.9%)	151(26.0%)	238 (31.5%)	203 (20.3%)	118 (19.2%)	226 (26.9%)	13,805 (12.8%)
$25,000 to $150,000	0	127 (21.8%)	353 (46.6%)	608 (60.8%)	248 (40.5%)	344 (41.6%)	72,029 (66.6%)
Median Family Income	$22, 639	$14,452	$24,111	$32,470	$21,507	$21,044	$49,053
Non-Family Households2	403	231	250	258	351	891	48,503
Median Non-Family Household Income	$11,243	$8,661	$13,276	$21,848	$47,455	$14,702	$29,619
Per capita income	$8,368	$5,728	$9,790	$9,905	$14,012	$9,299	$19,978

Source: U.S. Census Bureau. May 2013. 2007-2011 American Community Survey 5-Year Estimate. Estimated Income DHHS poverty guidelines 2010: 1 person - $10,830 and Family of four - $22,050. Numbers for incomes over $150,000 were not included.

1-228 (39.5%) of these 303 family households had an income of under $10,000.

2- See Total Households for estimated income breakdown.

In addition to the population and income characteristics, community character is also identified by community cohesion according to the guidance from the Caltrans CIA Handbook (2011). Community cohesion is the degree to which residents have (1) a "sense of belonging" to their neighborhood, (2) a level of commitment of residents to the community, and (3) a strong attachment to neighbors, groups, and institutions, usually as a result of continued association over time. Cohesive communities have been regularly linked to certain social characteristics such as high ratios of owner-occupied single-family residences, frequent interpersonal contact, ethnic homogeneity, and shared goals. Neighborhoods with residential stability are also indicative of areas with high community cohesion. Given that the three residential areas within the Project Study Area contain apartments for non-family households that are senior or disabled persons, the residential units are not owner occupied, and the residential areas are separated by at least one city block, a high community cohesion is not present. Furthermore, the lack of proper lighting, dirty pavement, overgrown plants, and abandoned plantings suggest an uninviting and unsafe place that is not typical of a cohesive community.

4.1.1.1 Housing

Based on the 2008 City of Fresno Housing Element, there were 163,704 housing units within the city limits in 2006. By 2010, the housing units increased by 4.6 percent to 171,288 dwelling units according to the U.S. Census Bureau. In 2006, 63 percent of the housing units were single family and 37 percent were multiple family. Assuming a similar ratio of single-family to multiple-family in 2010 as in 2006, it is estimated that approximately 107,910 single family units and 63,378 multiple family units exist in the City.

The Project Study Area includes three locations with residential uses. These locations include the Masten Towers, Hotel California, and the Pacific Southwest Building.

Masten Towers located at the northeast corner of Fresno Street and Broadway Plaza includes 200 units with one bedroom and studio apartments. Ten percent of the apartments (20 units) accommodate persons with physical disabilities (Masten Towers 2013).

The Hotel California at the southwest corner of Kern Street and Van Ness Avenue has 217 rooms. Currently, the building provides housing for low-income seniors (Balch 2013a).

The Pacific Southwest Building located at the southeast corner of Mariposa Mall and Fulton Mall accommodates approximately 12 people in 8 units. Currently, the housing is provided to above moderate income persons (Balch 2013a).

4.1.2 Environmental Consequences

4.1.2.1 Regional Population Characteristics/Community Character

The proposed reconstruction of Fulton Mall is located within an area of approximately 7.6 acres which is the project area. The Project Study Area encompasses approximately 65.5 acres. Construction and operational activities would be confined to the project area and would not affect the regional population characteristics or the character of the City of Fresno under build alternatives 1 and 2 and the no build alternative 3.

4.1.2.2 Neighborhoods/Communities/ Community Character

The build alternatives 1 and 2 would not result in a change to the population, income, or housing characteristics within the Project Study Area. Although residents live within the Project Study Area, they are located within apartment complexes that are separated by at least one block. Therefore, these apartment complexes do not create a residential neighborhood. The development of the project would not directly affect any of the apartment complexes. Construction and operation activities of the project could result in indirect air quality, noise, and traffic impacts as discussed in Section 4.5.2 below.

These potential construction impacts could also affect the “day” users of Fulton Mall. Areas under construction may be a little more difficult to reach, but access to businesses and offices would be maintained. After the project is completed, access to businesses and offices would be improved and parking would be available closer than the existing parking lots and garages in the area. With better access and parking opportunities, more people may be encouraged to visit the area for shopping, business, and recreational activities

Under the build alternatives, the streetscapes along Fulton Mall would continue to feature wide pedestrian walkways, benches and, particularly in the case of Alternative 2, planters and fountains. Therefore, the Mall project is not expected to substantially alter the presence of this transient population. However, the presence of greater economic and human activity in the Study Area, at more times of the day and night, may have the effect of balancing out the perception of a transient presence.

4.1.2.3 Housing

The implementation of the build alternatives 1 and 2 as well as the No Build Alternative (Alternative 3) would not result in the direct effect on housing units. The existing

housing units within the Masten Towers and Hotel Californian are not located directly adjacent to the proposed improvement areas and will not be affected. Although the existing residents located at the Pacific Southwest Building are adjacent to the proposed improvements to Fulton Mall and Mariposa Mall, the residents are located above the tenth floor and will not be affected (Balch 2013b).

In addition to the existing residential units, potential residential units as described in Section 2.1.1 above, are planned to be constructed with tenant improvements within the JC Penney Building at 959 Fulton Mall. There are approximately 66 residential units proposed on the second through the fifth floors (Balch 2013b). According to the property owner, an investment into the proposed residential units cannot occur with Fulton Mall in its present configuration and condition (Maghame 2012). As a result, the proposed tenant improvements for residential units at the JC Penney Building are not expected to occur prior to the reconstruction of Fulton Mall. Therefore, these potential units will not be affected by construction activities with the development of Alternatives 1 or 2.

4.1.3 Avoidance, Minimization, and Mitigation Measures

No mitigation measures are required for the build alternatives 1 and 2. In addition, the no build alternative would not require mitigation measures.

4.2 Economic Conditions

4.2.1 Affected Environment

4.2.1.1 Regional Economy

Similar to the nation, the Fresno Metropolitan Area has been in a recession with high levels of unemployment. The number of people unemployed in the Fresno area peaked in February 2010 at 81,362 that representing an unemployment rate of approximately 18.6 percent. This unemployment rate was substantially higher than the national unemployment rate of 9.7 percent.

4.2.1.2 Employment and Income

The Project Study Area is currently in a state of urban decay due to economic disinvestment; evidenced by high vacancy rates, low lease rates, low retail sales, high crime rates, and deteriorating physical conditions. These economic conditions result in low levels of employment within the Project Study Area.

Based on the Urban Decay Study, the high vacancy rates result in fewer employment opportunities. Currently, there are 299,380 sf of vacant office space and 430,528 sf of vacant retail/restaurant space. As an example, based on a national average employment

density for office uses of 291 sf per employee, the vacancy of the office space within the Fulton Mall Project Study Area has resulted in approximately 1,028 fewer employment opportunities. Although average employment density for retail/restaurant use is not provided in the Urban Decay Study, the Notice of Preparation and Scoping Meeting for the Downtown Neighborhoods Community Plan, Fulton Corridor Specific Plan, and Downtown Development Code identified a retail employment rate of 400 sf per person. Using this employment rate, the vacancy of the retail space within the Fulton Mall Project Study Area has resulted in approximately 1,076 fewer employment opportunities. Therefore, the current office and retail vacancies have reduced potential employment opportunities within the Project Study Area by approximately 2,104 jobs.

4.2.1.3 Business Activity

Businesses within the Project Study Area, and specifically within Fulton Mall are limited to pedestrian-oriented access. Surface parking and parking structures are located in the perimeter of the Project Study Area; however, visitors and patrons are required to walk to their destination within Fulton Mall.

The Project Study Area suffers from a significantly high vacancy rate. The Project Study Area had a vacancy rate of 46 percent for office uses and 35 percent for large retail spaces in 2010 based land uses as designated in the County Assessor's parcel database. Some of the buildings could actually have mixed uses. For example, a building designated as an "office" use by the County Assessor could have retail uses on the ground floor.

The Project Study Area's vacancy rate is abnormally high compared to the surrounding Downtown and overall City. The Downtown area has an office vacancy rate of 12.7 percent and a retail vacancy rate of 11.2 percent. The City of Fresno has an office vacancy rate of 15.8 percent and a retail vacancy rate of 11 percent. According to the Urban Decay Study (2012), the Downtown area has the second lowest office vacancy rate in the Fresno region which indicates that the Project Study Area's high vacancy rate is not attributable to its location and is due to other conditions.

According to real estate brokers interviewed as part of the Urban Decay Study, the Project Study Area suffers from high vacancies in part due to the exclusively pedestrian-orientation of the Fulton Mall. The lack of through-traffic is undesirable for office and retail businesses that thrive on visibility, and a lack of on-street parking limits access for both tenants and visitors. Real estate brokers who were interviewed for the Urban Decay Study provided several reasons why many clients currently will not located in the Project

Study Area. These reasons include low visibility, building age, current earthquake and building standards as well as amenities such as customizable spaces, secured covered parking, card-access entry, and high quality infrastructure for high-speed internet. In addition, the property owners of the JC Penney Building and the Pacific Southwest Building have stated that investments in the addition of residential units cannot occur with Fulton Mall in its present configuration and condition.

Several buildings in the Project Study Area are in a state of disrepair, particularly those with long-term vacancies.

Office lease rates are low in the Project Study Area in order to compensate for the issues identified above. The average asking lease rate for Project Study Area office space available in November 2011 was $1.03 per sf per month. This is 27 percent lower than the average asking lease rate for Class B office buildings Downtown, which was $1.41 per sf per month in the third quarter of 2011 (Rosenow Spavacek Group, Inc. 2012).

Although a precise comparison of Fulton Mall retail lease rates with Downtown and citywide averages is not available, the Fulton Mall's retail sales per square foot of $79/year are 61 percent lower than the Downtown average of $203 and 71 percent lower than the citywide average of $274 (Rosenow Spavacek Group, Inc. 2012).

4.2.2 Environmental Consequences

4.2.2.1 Regional Economy

The build alternatives 1 and 2 would not result in any direct impact on the regional (City) economy; however, these alternatives could influence growth through the reoccupation of existing vacant buildings, which on a regional (City) level could reduce the environmental impacts that would otherwise be created by outward suburban growth. The reoccupation of existing building could result in substantial beneficial effect on the regional (City) economy by providing a catalyst for additional development in the downtown area in accordance with the DNCP and FCSP.

The implementation of Alternative 3 would retain the existing pedestrian mall and would not affect the regional economy.

4.2.2.2 Employment and Income

The implementation of the build alternatives 1 and 2 would result in an induced effect on employment and income by providing better access and visibility to existing businesses and additional businesses that could reoccupy existing vacant buildings. The reoccupation of existing vacant buildings would result in a beneficial impact on

employment opportunities in the Project Study Area because the greater amount of tenancy within the Fulton Mall Project Study Area would result in a greater amount of employment opportunities. The employment opportunities could increase by providing approximately 2,100 new jobs as discussed in Section 4.2.1.2.

4.2.2.3 Business Activity

The implementation of the build alternatives will result in temporary effects on business activities as construction occurs in the immediate vicinity of the businesses. As each road segment is constructed, the sidewalks adjacent to the road segment will remain open for pedestrians with a barrier located between the sidewalk and the street. Once the street segment is completed, the segment will be available for pedestrian access. Automobile traffic will not be permitted until the proposed project is constructed. After the street segment is constructed, the sidewalk segments will be constructed. The portion of the sidewalks immediately adjacent to the business entrances/exits will be completed during the evening while the businesses are not operating. This will minimize the effect on the businesses as construction occurs.

In the long-term, the build alternatives would provide the parking and vehicle access to the project area that may influence the reoccupation of the existing vacant buildings, contribute to an increase in people shopping and doing business in the Project Study Area, and thus maximize sustainable development and economic productivity. In addition, with a higher occupancy of the Study Area by businesses, and the presence of more people, crime may be potentially reduced and there may be a greater sense of safety. Following are the anticipated retail sales for each alternative as identified in the Economic Impact Analysis.

Alternative 1 - This alternative would result in annual gross revenues increasing from $32.1 million to $79.1 million. Average retail sales would increase from $92 per sf to $184 per sf.

Alternative 2 - This alternative would result in annual gross revenues increasing from $32.1 million to $55.4 million. Average retail sales would increase from $92 per sf to $103 per sf.

Alternative 3 - The pedestrian mall under this alternative would remain unchanged. This alternative would continue to result in annual gross revenues of $32.1 million and average retail sales would remain at $92 per sf.

The indirect increase in retail sales shown above from the implementation of the build alternatives will result in an induced beneficial effect on the businesses within Fulton Mall.

Under the No Build Alternative, business activity within the Project Study Area is anticipated to remain unchanged and eventually result in a further increase in vacancies due to a decrease in business activity within the Project Study Area.

4.2.3 Avoidance, Minimization, and Mitigation Measures

No mitigation measures are required for the build alternatives 1 and 2. In addition, the no build alternative would not require mitigation measures.

4.3 Community Facilities and Services

4.3.1 Affected Environment

4.3.1.1 Community Facilities

There are federal and local community facilities that are located within the Project Study Area. These facilities currently provide a variety of services. Following is a listing of these facilities (Balch 2013a).

- U.S. Customs and Immigration Services - 1177 Fulton Mall and moving soon to 1255 Fulton Mall)
- U.S. Army Recruiting - 1171 Fulton Mall
- U.S. Social Security Administration - 865 Fulton Mall
- Internal Revenue Service - 1325 Broadway Plaza
- Fresno Council of Governments - 2035 Tulare Street
- Fresno Housing Authority - 1331 Fulton Mall
- Fresno County Department of Public Health - 1221 Fulton Mall
- Fresno County Office of Education - 1111 Van Ness Avenue
- Court Appointed Special Advocates (CASA) - 1252 Fulton Mall
- Chukchansi Park - 1800 Tulare Street
- Parking Lots and Garages - Lot 3 (Fulton and Mariposa Malls), Garage 4 (1919 Tulare Street), Lot 6 (Inyo Street and Fulton Mall), Garage 7 (801 Van Ness Avenue), Garage 8 (1077 Van Ness Avenue), and Garage 9 (2020 Merced Street).
- Mariposa Plaza - There are approximately 93 event days per year.

The hours of operations for the federal and local offices range between 7:30 am and 8 pm Monday through Friday. Chukchansi Park has baseball and soccer events that are

primarily in the evening; however, there are some events in the afternoon (Fresno Grizzlies 2013 and Fresno Fuego Futbol Club 2013).

The hours of operation of the City parking lots and garages are 6 am to 6 pm and Garages 4, 7, and 8 are open until 10 pm during events (Balch 2013a).

The 93 event days associated with Mariposa Plaza includes 73 days associated with the annual Ice Rink and 20 additional official event days. During the 73 days associated with the Ice Rink, there are approximately 31,000 skaters and 30,000 onlookers and guests at the various events related to the rink such as FLYP happy hour, Christmas Tree event, birthday parties, etc. During the 20 days of other events, there are approximately 143,550 attendees. Some of the larger special events include the Fiestas Patrias, or Mexican Independence Day celebration; Cinco de Mayo; and the Catacomb Party music and art festival, each of which draws thousands of visitors (Balch 2013a).

4.3.1.2 Emergency Services

The emergency services that are provided in the Fulton Mall vicinity include police, fire, ambulance service, and hospital. Following is a brief discussion of each.

The City of Fresno Police Department operates five police stations within the City. The nearest station to Fulton Mall is located at 2323 Mariposa Mall, which is within the Project Study Area.

The City Fire Department has 19 fire stations throughout the City and serves approximately 336 square miles. The nearest fire station (Station #3) to Fulton Mall is located at the southeast corner of Fresno Street and E Street, which is approximately 0.4 mile from Fulton Mall.

Ambulance service is provided by numerous companies within the City of Fresno. The nearest ambulance company to the Fulton Mall is American Ambulance, which is located approximately 1.2 miles from Fulton Mall.

The hospital that serves the Downtown area as well as the Fresno County region is the Community Regional Medical Center located north of the Fresno Street and Divisadero Street intersection. This hospital is located approximately 0.4 mile from Fulton Mall.

4.3.1.3 Utilities

The utilities in the Fulton Mall vicinity include water, sewer, drainage, natural gas, electricity, and telecommunication systems (i.e., cable and telephone). The water, sewer, and drainage facilities are owned by the City of Fresno while the natural gas and

electricity is owned by Pacific, Gas & Electric, and telecommunication systems in the Fulton Mall Project Study Area are not known.

Water distribution facilities are currently located within Federal Alley east of Fulton Mall and within Home Run Alley and Congo Alley west of Fulton Mall, respectively, between Inyo Street and Tuolumne Street. These facilities range from 6-inch to 15-inches in diameter. Additional water distribution lines also ranging in diameter from 6-inch to 15-inches are located within Inyo Street, Kern Mall and Street, Tulare Street, Mariposa Mall, Fresno Street, and Tuolumne Street. Each of the existing water distribution facilities identified above are currently adequate to serve the existing uses. No water transmission lines or pump stations are located in the Fulton Mall vicinity (Sherwood Design Engineers 2012).

Public and private sewer distribution facilities are located within the Fulton Mall vicinity. Public sewer facilities include up to 30-inch lines within Merced Mall between Van Ness Avenue and H Street, Kern Mall and Street from Van Ness Avenue to Home Run Alley, and Home Run Alley between Kern Mall and Inyo Street. Private sewer lines are located within Federal Alley, Home Run Alley, and Congo Alley except for the portion of Home Run Alley south of Kern Mall. Each of the existing sewer facilities identified above are currently adequate to serve the existing uses. No sewer pump stations are located in the Fulton Mall vicinity (Sherwood Design Engineers 2012). The sewer facilities, while adequately sized to serve existing uses, are of very advanced age and in poor condition. The City of Fresno Department of Public Utilities has plans to rebuild these facilities with local funds. This project is anticipated to occur simultaneous with the implementation of the Fulton Mall Reconstruction Project.

Storm drain facilities are located within the Fulton Mall vicinity. A storm drain is located under Fulton Mall between Inyo Street and Tuolumne Street. Addition storm drains are located within Merced Mall between Van Ness Boulevard and H Street, Fresno Street between Van Ness Boulevard and H Street, Mariposa Mall between the Federal Alley and H Street, Tulare Street between Home Run Alley and H Street, Kern Mall between Home Run Alley and Federal Alley, and along Home Run Alley between Kern Mall and Tulare Street. Each of the existing drainage distribution facilities identified above are currently adequate to serve the existing uses (Sherwood Design Engineers 2012).

Natural gas, electricity, and telecommunication systems are located in the Fulton Mall vicinity. The specific location of these facilities are not known at this time; however, it is known that some of these facilities are located within Fulton Mall.

4.3.2 Environmental Consequences

4.3.2.1 Community Facilities

Construction activities associated with the build alternatives could impede access during construction activities to the community facilities that are located along Fulton Mall. However, the Fulton Mall Reconstruction would occur in segments along Fulton Mall. As each road segment is constructed, the sidewalks adjacent to the road segment will remain open for pedestrians with a barrier located between the sidewalk and the street. The public will be able to access the federal and local community facilities that are located on the Mall. Once the street segment is completed, the segment will be available for pedestrian access. Automobile traffic will not be permitted until the proposed project is constructed. After the street segment is constructed, the sidewalk segments will be constructed. The portion of the sidewalks immediately adjacent to the entrances/exits of the community facilities will be completed during the evening while the community facilities are closed. This will minimize the effect on the public accessing the community facilities that are located along the Mall. Access to the community facilities that are not located along the Mall will not be directly affected by construction activities.

Construction activities are not expected to affect the public parking at Garages 4, 7 and 8 for events at Chukchansi Park because each of these garages includes accesses from current public streets that will not be affected with project construction.

Separate from the Fulton Mall Reconstruction Project, the City of Fresno and various community partners have been awarded funds from the National Endowment for the Arts (NEA) and other, nonfederal sources for the Mariposa Plaza Activation Project. The purpose of this Plaza project is to make it easier to create community events at Mariposa Plaza, and more pleasant to attend them, as well as encouraging daily use of the space. The Plaza project will involve redesigning the Mariposa Plaza area, particularly the parcel adjacent to the Fulton Mall right-of-way that is currently the site of the oval stage structure and a stand of several trees. Construction to implement this design is also anticipated, but is beyond the scope of the NEA-funded project and has not yet been funded. The NEA-funded Plaza project scope also includes the commission of a new work of interactive public sculpture, which is envisioned to complement the redesign and use of the Plaza. This is anticipated to occur in the stage parcel described above.

During construction of Alternatives 1 or 2, if special events cannot be accommodated in their normal locations on the Mall or at Mariposa Plaza, alternate locations will be arranged by the City and Downtown Fresno Partnership. These could include the use of Courthouse Park or parking lots in and around the Study Area. Upon completion of

construction, these events will be welcomed back to the Project Area and Mariposa Plaza. The reintroduced streets will deliberately be designed to be closed for such occasions.

4.3.2.2 Emergency Services

Federal Alley and Home Run Alley/Congo Alley currently parallel Fulton Mall that could provide access to police and fire personnel in case of an emergency. The placement of streets along Fulton Mall would provide long-term improvement to police and fire personnel access to the structures along Fulton Mall. This long-term access for police and fire personnel would result in a beneficial impact on these services.

According to Captain Greg Garner, the police captain in charge of the Southwest Policing District which includes the Project Study Area, most criminal acts are committed around the Fulton Mall are crimes of opportunity. While criminal offences range from severe (such as armed robbery) to minor (such as loitering), the most common offences include petty theft, vandalism, and illegal panhandling. Captain Garner believes that opening the Mall to traffic has the potential to have a beneficial impact on reducing crime (Urban Decay Study 2012).

Similar to police and fire services, the build alternatives could impede emergency service during construction activities; however, the build alternatives would occur in segments and thus limiting the area under construction at one time. In addition, Federal Alley and Home Run Alley/Congo Alley currently parallel Fulton Mall that could provide access to emergency personnel. Once constructed, the streets along Fulton Mall would improve access in the Project Study Area. The long-term for emergency personnel would result in a beneficial impact on these services.

Alternative 3, No Build Alternative, would retain the pedestrian mall and would not alter the current police, fire, and emergency services.

4.3.2.3 Utilities

Construction activities are anticipated to encounter a number of existing utilities located within the construction area of Fulton Mall. During the development of the design plans, these existing utilities will be identified. During construction, they will be located so that the services provided by the utility are not adversely affected. In the event that utility service is required to be disrupted such as water or electricity due to construction activities, temporary impacts to businesses that rely on the services could occur for a short duration.

4.3.3 Avoidance, Minimization, and Mitigation Measures

Alternatives 1 and 2 will not require mitigation measures. Alternative 3, No Build Alternative, would retain the pedestrian mall and would not affect utility service.

4.4 Relocations

4.4.1 Affected Environment

Currently there are mobile cart vendors that have business license to operate within the Fulton Mall. Based on information provided by Kate Borders, CEO of the Downtown Fresno Partnership, mobile cart vendors operate daily on Fulton Mall at the corners of Merced Mall, Mariposa Mall, Tulare Street, and Kern Mall (Balch 2013a).

4.4.2 Environmental Consequences

Construction activities associated with Alternatives 1 and 2 will not require the relocation of the businesses within the Study Area. Construction activities would occur in increments so that access to the businesses could be retained as discussed in Section 4.2.2.3, Business Activity.

Since construction activities will occur in increments, construction activities will require the mobile cart vendors to relocate to a portion Fulton Mall that has not been constructed or a portion of Fulton Mall that has been reconstructed with a street. The street within Fulton Mall will not be open for vehicular traffic until the reconstruction of Fulton Mall is completed.

In the long-term under Alternatives 1 and 2, the mobile vendor carts may require a new location for their mobile cart because their current location could be in an area that would be converted into a street. However, during the design phase, locations appropriate for cart vendors will be identified. Long-term impacts to the mobile cart operators are anticipated to be potentially beneficial as business vitality in the area increases.

Alternative 3, No Build Alternative, would retain the pedestrian mall and would not affect the existing vendor cart businesses.

4.4.3 Avoidance, Minimization, and Mitigation Measures

Alternatives 1 and 2 will not require mitigation measures. Alternative 3, No Build Alternative, would retain the pedestrian mall and would not affect the existing vendor cart businesses.

4.5 Environmental Justice

Due to the presence of low-income and minority populations in the vicinity of Fulton Mall, there is a potential for environmental justice impacts. Environmental justice deals with the inequitable environmental burden borne by groups such as low-income and minority populations.

All projects involving a federal action such as funding, permit, or land must comply with Executive Order (EO) 12898, "Federal Action to Address Environmental Justice in Minority Populations and Low-Income Populations," signed by President Clinton on February 11, 1994. EO 12898 requires that each federal agency, to the greatest extent practical and permitted by law, shall "make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high, and adverse human health or environmental effects of its programs, policies, and activities, on minority possessions…" Thus, Order 12898 is designed to focus attention on environmental and human health conditions in areas of high minority and low-income communities and to prevent discrimination in programs and projects substantially affecting human health and the environment (Federal Register, 1994). The Order requires that the U.S. EPA and all other federal agencies (as well as state agencies receiving federal funds) to develop strategies to address this issue. The agencies are required to identify and address any disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and/or low-income populations.

4.5.1 Affected Environment

As discussed in Section 4.1.1.2, Neighborhoods/Communities/Community Character, the Project Study Area is made up of three census blocks (1023, 1024, and 1031) within Census Tract 1. That tract contains a total of 22 blocks. These three census blocks are primarily commercial development, mostly retail stores and offices, but there are three complexes with residential uses within these three blocks. The three complexes contain approximately 425 units with approximately 466 residents. Tract 1 contains approximately 2,860 persons, and therefore, the Project Study Area contains approximately nine percent of the residential population within Tract 1.

As stated previously, due to lack of information at the census block level, the population and ethnic census data presented in Table 3 in Section 4.1.1.2 was only available at the tract level for 2010. Table 3 shows the persons in Tract 1 has the highest percentage of the white race (73.4 percent) compared to each of the five remaining tracts within the downtown area (area between Highway 99, Highway 41, and Highway 180) as well as

compared to the City of Fresno (49.6 percent). Because ethnicity is different then race and Hispanic persons could be of any race, a review of the persons that are of Hispanic origin compared to non-Hispanic was conducted. According to Table 3, the percentage of Hispanic persons within Tract 1 (55.7 percent) is less than the other tracts within the downtown area; however, Tract 1 has a greater percentage compared to the City of Fresno (46.9 percent). Although the Project Study Area is a small fraction of persons within Tract 1, there is a possibility that the Project Study Area could have a disproportionate number of minority populations when compared citywide, although this cannot be determined from the available information.

Also presented in Section 4.1.1.2, Table 4 shows the poverty status for Tract 1, the remaining five census tracts within the downtown area and the City of Fresno. As shown in Table 4, there are 420 households within Tract 1 and the majority of these households are made up of mostly single persons living alone. The per capita income for persons living within Tract 1 is $8,368, which is lower than the poverty levels of $10,830 for one person. Within the five remaining tracts of downtown, there is one tract (Tract 2) that has a lower per capita income and the three remaining tracts have a higher per capita income. Comparing Tract 1 with the City of Fresno, the per capita income for all persons living in the City of Fresno is approximately 239 percent higher than Tract 1.

Within the Project Study Area, the estimated residential population is 466. Of these, it is anticipated that the residents at the Masten Towers and Hotel California (about 450 persons) are characterized as very low to low-income persons. At Masten Towers, residents must qualify for Section 8 housing meaning that they must be low-income according to Fresno County. This may be a somewhat different standard than the Department of Health and Human Services poverty guidelines, but would still be similar. Many residents at the Hotel Californian rely on income from Social Security Supplemental Security Income or military pensions. The remaining 12 persons residing at the Pacific Southwest Building are not characterized as low-income persons. Based on the above information, the Project Study Area very likely has a disproportionate number of low-income populations.

Based on the types of businesses currently located on the Fulton Mall, many may be minority owned. Several retail businesses appear to serve the Hispanic community. Restaurants are mainly Hispanic or other ethnic foods.

4.5.2 Environmental Consequences

Masten Towers is located approximately 225 feet west of the nearest area proposed for reconstruction. The Hotel Californian located at the southwest corner of Kern Street and Van Ness Avenue is located within a few feet of the nearest area of Kern Street proposed for reconstruction. The Pacific Southwest Building located at the southeast corner of Mariposa Mall and Fulton Mall has residents living in the upper floors (above the tenth floor) of the 16-story building.

All businesses, including minority owned businesses, would benefit from increased access and parking provided by Alternative 1 or 2. No businesses would be directly impacted or relocated. Construction activities could result in temporary effects, such as temporary air, noise or visual impacts. During construction, access to the business would be provided.

Construction activities associated with Alternatives 1 and 2 would not result in direct impacts to the residents at the three complexes because the project does not include impacts to the buildings within the Study Area. The construction activities could result in temporary effects on the residents and current Mall "day" users as discussed in Section 4.1.2.2. These temporary impacts could include increases in air emissions, noise levels, and construction traffic. These increases could occur during demolition, grading of the right-of-way, construction of the curbs and gutters, placement of the rock and asphalt for the roadbed, and construction of the sidewalk. Following is a discussion of potential impacts to the residences within the Project Study Area and the Mall "day" users.

The nearest residences to the construction activities include those within the Pacific Southwest Building and the Hotel California. Construction activities will occur within street segments that will encompass less than one acre.

Air Quality - Construction activities will increase emissions of criteria pollutants including reactive organic gases (ROG), oxides of nitrogen (NOx), carbon monoxide (CO), and particulate matter (PM10 and PM2.5). During grading activities, dust and particulates have a potential to be generated; however, the contractor will be required to comply with the San Joaquin Valley Air Pollution Control District's (SJVAPCD) Regulation VIII, which controls fugitive dust. According to the SJVAPCD Guide for Assessing and Mitigating Air Quality Impacts (GAMAQI), the air emissions thresholds within the San Joaquin Air Basin are 10 tons of ROG and NOx per year, and there are no thresholds for CO. The emissions associated with the project will occur over an approximately seven-week period within each construction segment. The segments will

overlap; however, the construction activity such as grading will only occur within one segment at a time. The emissions associated with the project are expected to result in substantially less ROG and NOx emissions than 10 tons per year.

Long-term air emissions associated with traffic volumes under Alternatives 1 and 2 are not expected to directly increase because these alternatives do not result in the addition of land uses. The current traffic volumes would be redistributed onto the proposed new roadways and air emissions would remain the same.

Noise - Construction activities will increase noise levels. These noise levels could range from 95 dB with jackhammers to 82 dB with tractors. Noise levels at the residential complexes will reduce as the construction activity move further away from the complexes. According to the Fresno Municipal Code, construction activities occurring during the daytime hours of 7:00 a.m. to 10:00 p.m., excluding Sundays, are exempt from the City's noise ordinance standards. Although exempt, a review of currently adopted thresholds to determine if noise levels could result in harm to individuals was conducted. The Occupational Safety and Health Administration (OSHA) noise limits were reviewed. OSHA standards were established for noise exposure of workers; however, they could also be applied to residents. OPSHA standards allow a noise exposure level of 90 dB over an eight-hour exposure period, 92 dB over a six-hour exposure period, 95 dB for four hours of exposure, 97 dB for a three-hour period, and 105 dB for one hour of exposure. Typical operation of construction equipment includes cycles that may involve 1 to 2 minutes of full power operation followed by 3 to 4 minutes at lower power settings. As a result, the OSHA noise exposure levels would not be exceeded during the construction activities associated with Alternatives 1 and 2.

Long-term noise levels associated with traffic volumes under Alternatives 1 and 2 will increase along Fulton Street, Kern Street, Mariposa Street, and Merced Street due to the redistribution of existing traffic volumes. The increase in traffic volumes will not exceed the volumes along current streets within the Project Study Area such as Tuolumne Street, Fresno Street, Tulare Street, Inyo Street, and Van Ness Avenue. These streets have residences located directly adjacent to these streets such as Fresno Street and Van Ness Avenue. As a result, noise levels along the new streets will not be substantially different from current noise levels.

Traffic - Construction traffic volumes will increase with the hauling of demolition material and export soil as well as delivery of rock, asphalt, concrete, and other materials. Increases in construction traffic could result in potential safety effects as the construction

vehicles enter or exit the construction areas. A traffic safety control plan will be required during construction activities.

Long-term traffic volumes under Alternatives 1 and 2 will increase will increase along Fulton Street, Kern Street, Mariposa Street, and Merced Street due to the redistribution of existing traffic volumes. The increase in traffic volumes will not exceed the volumes along current streets within the Project Study Area such as Tuolumne Street, Fresno Street, Tulare Street, Inyo Street, and Van Ness Avenue. An evaluation of the increases in traffic volumes on the existing street network was conducted. The increase in average daily traffic with Alternatives 1 and 2 would result in an increase of a maximum of 72 trips per day. This increase in daily traffic volumes on the existing street network is considered nominal.

Economic Effects - As discussed in Chapter 3, Growth, Alternatives 1 and 2 are expected to influence growth in the Project Study Area resulting in decreases of vacancies. In addition as discussed in Section 4.2.2.2, Employment and Income, Alternatives 1 and 2 will result in increases in gross revenues and average retail sales. These changes that would result from the implementation of Alternatives 1 and 2 is expected to improve property values as well as investment in the maintenance of the structures within the Project Study Area. This investment would prevent further deterioration of the Project Study Area and therefore, the low income and minority residents that live in the Project Study Area will experience an improvement in visual quality and increase in safety within Fulton Mall.

Implementation of Alternative 3 would retain the pedestrian mall and would not result in environmental justice impacts associated with air quality, noise, traffic, and the economy.

4.5.3 Avoidance, Minimization, and Mitigation Measures

Based on the above discussion and analysis, the build alternative 1 and 2 would not cause disproportionately high and adverse effects on any minority or low-income populations as per Executive Order 12898 regarding environmental justice.

Chapter 5 Traffic and Transportation/ Pedestrian and Bicycle Facilities

5.1 Affected Environment

5.1.1 Access, Circulation, and Parking

The existing superblock that contains the Project Study Area is bound by Tuolumne Street on the north, Van Ness Avenue to the east, Inyo Street to the south, and H Street/Broadway Street on the west. Due to the presence of the Fulton Mall, traffic circulation patterns are disrupted due to access restrictions. No vehicular traffic is permitted on Fulton Mall. West of Van Ness Avenue, Kern Street and Merced Street dead end into Fulton Mall. Vehicles using these two streets require use of Federal Alley that parallels Fulton Mall on the east. Federal Alley is a one-way (southbound) street. Federal Alley can also be accessed along Tuolumne Street, Fresno Street, and Tulare Street. Home Run Alley is parallel and west of Fulton Mall between Tulare Street and Inyo Street. Congo Alley is parallel and west of Fulton Mall between Tulare Street and Tuolumne Street. Home Run Alley and Congo Alley are also primarily one-way (southbound) street with the exception of the portion of Congo Alley immediately north of Fresno Street adjacent to the Masten Towers.

Parking is currently provided on the outer parts of the Project Study Area. This parking includes surface parking and structure parking. There are currently approximately 2,255 surface and structure parking spaces, and there are an additional 14 metered parking spaces located along Kern Street and Merced Street west of Van Ness Avenue.

Bicycles are permitted within Fulton Mall; however, Fulton Mall is not a designated bike route by the City of Fresno. Designated bicycle routes are provided along Tuolumne Street, Fresno Street, Tulare Street, and Inyo Street.

Pedestrians currently have access along sidewalks outside of the mall areas and within the Project Study Area. The Fulton Mall is restricted to pedestrian access.

At the eastern edge of the Project Study Area, the pedestrian crossing of Van Ness Avenue along the Mariposa alignment, to and from Courthouse Park, is currently accommodated only by use of an underground tunnel.

5.1.2 Public Transportation

The public transportation provided in the City of Fresno is the Fresno Area Express (FAX). FAX provides many routes and bus stops throughout the City. The downtown transit center is located on the east side of Van Ness Avenue between Fresno Street and Tulare Street (Fresno Area Express 2013). Bus stops and bus routes are located along Van Ness Avenue, Inyo Street, H Street, Tuolumne Street, Fresno Street, and Tulare Street. There are no bus stops or bus routes within Fulton Mall (Fresno Area Express 2013 and Google Earth 2013).

5.2 Environmental Consequences

5.2.1 Access, Circulation, and Parking

The provision of a street along Fulton Mall will largely restore the circulation grid pattern in the Project Study Area, which will provide vehicle circulation in a currently restricted area under Alternatives 1 and 2. Federal Alley, Home Run Alley, and Congo Alley would remain one-way. The implementation of Alternatives 1 and 2 would provide a beneficial effect on circulation and access within the Project Study Area. Alternative 3 would retain the pedestrian Mall and therefore, circulation patterns within the Project Study Area would continue to be disrupted due to access restrictions.

The implementation of the street network within Fulton Mall under the build alternatives 1 and 2 will not directly increase traffic volumes because no new land uses are proposed. The existing traffic volumes within the Project Study Area would be redistributed as the street network is provided. Since traffic volumes will be redistributed, there will be locations within the Project Study Area that will experience increases in traffic volumes (such as areas that do not currently experience traffic volumes) and locations that will experience decreases in traffic volumes. The locations that will increase traffic volumes as a direct result of implementing the build alternatives 1 or 2 would result in a maximum increase of 210 average daily trips compared to existing volumes (Fehr & Peers 2013).

The existing surface and structure parking will not be affected under Alternatives 1 and 2 because no structures are proposed to be added or removed as part of the project. As stated above, 14 metered parking spaces are currently provided on Kern Street and Merced Street south of Van Ness Avenue. Under Alternative 1, Fulton Street between Tuolumne Street and Inyo Street would include 252 on-street parking spaces and Kern, Mariposa, and Merced streets would include 117 on-street parking spaces. Under Alternative 2, Fulton Street between Tuolumne Street and Inyo Street would include 127 on-street parking spaces and Kern, Mariposa, and Merced streets would include 117 on-street parking spaces. The provision of parking spaces along Fulton, Kern, Mariposa, and

Merced streets under Alternatives 1 and 2 will include parking meters that will provide convenience for shoppers and visitors. The provision of parking along the streets within the Project Study Area would improve access to local businesses on Fulton Street, increase economic productivity of the retail stores, and provide a catalyst for additional sustainable development within the Project Study Area. The provision of parking would result in a beneficial effect. Alternative 3 would continue to prohibit vehicular traffic within the Mall as well as parking.

The implementation of the build alternatives 1 and 2 would add bicycle routes within the Project Study Area. The additional routes would provide beneficial impacts on alternative transportation. Alternative 3 would continue to allow bicycles within Fulton Mall.

With the implementation of Alternatives 1 and 2, pedestrian access throughout Fulton Mall will be restricted to sidewalks adjacent to the proposed streets as well as crosswalk areas that connect one side of the street to the other side. Although pedestrian access is partially affected under Alternatives 1 and 2, this potential effect is not considered adverse because pedestrian access will be retained.

Under Alternative 3, pedestrian access will remain unchanged and therefore, this alternative would result in no affect on pedestrian access.

Separate from the Fulton Mall Reconstruction Project, the City has been awarded funds from the Federal Transit Administration (FTA) Bus Livability Program to improve the Van Ness/Mariposa intersection and surrounding area. These improvements will include an at-grade signalized pedestrian crossing of Van Ness at Mariposa, as well as aesthetic and functional improvements to the underground tunnel.

5.2.2 Public Transportation

Alternatives 1, 2, and 3 would not alter the existing public transportation that is currently provided by the Fresno Area Express because the bus stops and bus routes would not be altered. Therefore, the implementation of these alternatives would result in no affect on public transportation.

Separate from the Fulton Mall Reconstruction Project, the City has been awarded funds from the Federal Transit Administration (FTA) Very Small Starts Program to construct a 13.8-mile Bus Rapid Transit (BRT) system along major corridors in the city. The central stop for the BRT system will be at the corner of Van Ness and Mariposa. The FTA has also awarded Bus Livability Program funding, described above, to improve pedestrian

use and access to and around this station in the vicinity of the Van Ness/Mariposa intersection. This includes integrating the BRT station platforms in the middle of the Van Ness Avenue alignment with the signal-controlled pedestrian crossing of Van Ness Avenue at Mariposa.

5.3 Avoidance, Minimization, and Mitigation Measures

No mitigation measures are required for the build alternatives 1 and 2. In addition, the no build alternative would not require mitigation measures.

Appendix A References Used and Contacts

Balch, Elliott. 2013a. City of Fresno Downtown Revitalization Manager. E-mail correspondences dated May 21, 2013, June 14, 2013, July 16, and July 22, 2013.

Balch, Elliott. 2013b. City of Fresno Downtown Revitalization Manager. Telephone conversation July 16, 2013.

Delcore, Henry, D, Ph.D., Mullooly, James, Ph.D., and Visser, Anne. 2010. Fulton Mall Pedestrian County Project, Downtown Association of Fresno/Institute of Public Anthropology.

Dyett & Bhatia. 2011. Fresno General Plan and Development Code Update, Working Paper 1: Economic Development.

Fehr & Peers. 2013. Draft Transportation Impact Report, Fulton Mall Reconstruction Project.

Fresno Area Express. 2013. Website: http://www.fresno.gov/NR/rdonlyres/E1B45744-443D-4575-BD2F-286945C54C04/0/FAXSYSMAP.pdf. Accessed June 20, 2013.

Fresno Area Express. 2013. Website: http://www.fresno.gov/NR/rdonlyres/12A20CD6-D15B-45BC-A532-9493F1A01FA2/0/TRANSITMALLMAP08_11.pdf. Accessed June 19, 2013.

Fresno Fuego Futbol Club. 2013. Website: http://www.fresnofuego.com/. Accessed July 16, 2013.

Fresno Grizzlies. 2013. Website: http://www.milb.com/content/page.jsp?sid=t259&ymd=20081119&content_id=481726&vkey=team1. Accessed July 16, 2013.

Gibbs Planning Group, Inc. 2011. Fulton Mall Alternatives Plans, Economic Impact Analysis.

Google Maps. August 26, 2012. Accessed June 19, 2013.

Impact Sciences. 2012. Notice of Preparation and Scoping Meeting for the Downtown Neighborhoods Community Plan, Fulton Corridor Specific Plan, and Downtown Development Code.

Khatchadourian, Sevak, 2012. Letter to Kristine Cai, Fresno Council of Governments.

Maghame, Shay. 2012. Letter to Kristine Cai, Fresno Council of Governments.

Masten Towers. Website: http://mastentowers.org/amenities.htm. Accessed June 2013.

Moule & Polyzoides. 2011. Downtown Neighborhoods Community Plan.

Moule & Polyzoides. 2011. Fulton Corridor Specific Plan.

Rosenow Spevacek Group, Inc. 2012. Fulton Mall Urban Decay Study, Fulton Corridor Specific Plan.

Sherwood Design Engineers. 2012. Fulton corridor Specific Plan and Community Plan EIR Technical Report.

U.S. Census Bureau. May 2013. 2007-2011 American Community Survey 5-Year Estimate.

U.S. Census Bureau. June 2013. State and County QuickFacts. Website: http://quickfacts.census.gov/qfd/states/06/06019.html. Accessed July 26, 2013.

U.S. Department of Labor, Bureau of Labor Statistics, Databases, Table & Calculators by Subject. 2010. Website: http://data.bls.gov/timeseries/LAUMT06234203?data_tool=XGtable. Accessed June 27, 2013.

U.S. Department of Labor, Bureau of Labor Statistics, New Release. February 2010. Website: http://www.bls.gov/news.release/archives/empsit_03052010.pdf. Accessed June 27, 2013.

Appendix B List of Preparers

This document was prepared by the following:

Michael Houlihan, Environmental Planner. B.S., City and Regional Planning, California State University, San Luis Obispo; 28 years environmental planning experience. Contribution: Wrote Community Impact Assessment for the project.

Appendix I: Noise Study

Fulton Mall Reconstruction Project

Noise Study

Fulton Mall, City of Fresno
Fresno County, California

Federal Project # TCSPL-5060(263)

Prepared By: Michael E. Houlihan, AICP
FirstCarbon Solutions | Michael Brandman Associates

Date: September 5, 2013

Prepared For: California Department of Transportation

September 2013

Noise Study

Prepared For: Wilma Quan
City of Fresno

Prepared by: FirstCarbon Solutions | Michael Brandman Associates

Date: September 5, 2013

The purpose of this memorandum is to review and evaluate the potential short- and long-term noise and vibration impacts that may result from construction and implementation of the proposed Fulton Mall Project.

Proposed Project

The purpose of the proposed project is to improve parking and vehicle access to local businesses on Fulton Street in order to maximize sustainable development and economic productivity in conjunction with other downtown redevelopment projects. The proposed project is also intended to lower crime and improve safety for people walking between parking areas and businesses located on the Fulton Mall and for people who live in, work in, and visit the project area.

The City of Fresno proposes to reconstruct Fulton Mall as a complete street by reintroducing vehicle traffic lanes to the existing pedestrian mall. The Mall consists of 6 linear blocks that were open to traffic prior to 1964 but now do not allow public vehicle access. The Mall is bounded by Tuolumne Street to the north and Inyo Street to the south, and includes portions of three cross streets. The total length of the new roadways would be 0.74 mile.

The “Mall” refers specifically to the pedestrian areas between adjoining buildings located on the former City streets of Fulton, Mariposa, Merced, and Kern, which function as an integrated pedestrian Mall. Fresno Street and Tulare Street, which do allow vehicle traffic, run through the Mall and divide it into three roughly equal sections. Mall landscaping elements include fountains, planters, benches, sculptures, electrical systems, irrigation systems, and two “tot lots.” The Mall does not include the adjoining buildings or their façades.

Each Build Alternative proposes to reconstruct the Mall using “complete streets” design concepts. Complete streets are those designed to function as shared public space, or as “living streets”—for pedestrians, cyclists, outdoor businesses, and slow-moving, cautiously driven vehicles. Complete streets may include narrow roadways, corner bulb-outs, winding streets, and other traffic calming measures to lower driving speeds; street trees and other landscape elements; wide pedestrian sidewalks and crosswalks; and bicycle accommodations such as dedicated bicycle lanes or wide shoulders. The purpose of incorporating these design concepts into the proposed project is to retain portions of the historic fabric and character of the Mall, and maintain the key elements, feeling, and unique experience of a pedestrian mall in downtown Fresno.

The proposed project has three Alternatives, including two Build Alternatives and a No Build Alternative.

Alternative 1 consists of reopening the Mall with two-way streets, with one lane of vehicular traffic in each direction alongside bicycle, pedestrian, and potentially other travel modes. On-street vehicle parking spaces would be reintroduced along the length of the Mall (including cross streets), and construction of streetscape improvements would optimize the streets for the new blend of travel modes. One 11-foot vehicle travel lane would run in each direction, with a parallel parking lane of 9 feet included on both sides of the streets. A 20-foot sidewalk included on both sides of the streets would allow for walking and pedestrian-only seating, landscaping, lighting, and public art.

The existing 20 works of sculpture present on the Mall today would all remain, although some may be moved so as to be incorporated in sidewalk areas of the new streetscape. Only the 3 fountains found along the Kern Mall, west of Fulton, would remain. All of the planter beds and raised seating areas found along the Mall today would be removed in favor of wide sidewalks that incorporate artwork and seating areas. The two tot lots present, one located near the corner of Merced and Fulton, and the other located near the corner of Kern and Fulton, would be relocated and potentially combined into one larger tot lot on Kern Mall between Fulton Street and Home Run Alley, or near the corner of Mariposa and Fulton. Impacts to native earth during project construction are not anticipated.

Alternative 2 consists of reconnecting the street grid as in Alternative 1, but would include rebuilding distinctive elements of the Mall in five to six specific locations, known as “vignettes.” The vignettes would include many of the existing elements (sculptures, fountains, pavement pattern, trees, etc.). One 11-foot vehicle travel lane would run in each direction and would curve through the vignettes to avoid existing landscape features. Outside the vignette areas, the street would be straight, and the landscape would include a 9-foot parallel parking lane and pedestrian-only walking, seating, vegetation, and public art areas 20 feet wide on one or both sides of the street. Within the vignettes, the existing Mall landscape elements would be kept maximally intact. The remaining space on each side of the street would be dedicated to pedestrian travel, seating, vegetation, and artwork.

A total of 12 fountains—9 in vignettes and 3 on Kern Mall west of Fulton—would remain in place. The 12 fountains would be fully rebuilt or restored to working order. Fourteen of the 20 sculptures would remain in their current locations. The other 6 (along with the various tile mosaics benches on the Mall today) would be configured differently within the current right-of-way to accommodate the new streetscape. Street lighting outside the vignettes would be contemporary and pedestrian-oriented, but the original Mall fixtures would be rehabilitated within each vignette. The 2 tot lots present, 1 located near the corner of Merced and Fulton, and the other located near the corner of Kern and Fulton, would be relocated and potentially combined into one larger tot lot on Kern Mall between Fulton Street and Home Run Alley, or near the corner of Mariposa and Fulton. Impacts to native earth during project construction are not anticipated.

The third Alternative is the no-build Alternative. New streets would not be constructed and the Mall would remain as it now exists.

Environmental Setting

Noise is defined as unwanted sound. Sound becomes unwanted when it interferes with normal activities, when it causes actual physical harm or when it has adverse effects on health. Sound is produced by the vibration of sound pressure waves in the air. Sound pressure levels are used to measure the intensity of sound and are described in terms of decibels. The decibel (dB) is a logarithmic unit, which expresses the ratio of the sound pressure level being measured to a standard reference level. A-weighted decibels (dBA) approximate the subjective response of the human ear to a broad frequency noise source by

discriminating against very low and very high frequencies of the audible spectrum. They are adjusted to reflect only those frequencies that are audible to the human ear.

Noise equivalent sound levels are not measured directly, but are calculated from sound pressure levels typically measured in dBA. The equivalent sound level (L_{eq}) represents a steady state sound level containing the same total energy as a time varying signal over a given sample period. The peak traffic hour L_{eq} is the noise metric used by California Department of Transportation (Caltrans) for all traffic noise impact analyses.

The Day-Night Average Sound Level (L_{dn}) is the weighted average of the intensity of a sound, with corrections for time of day, and averaged over 24 hours. The time of day corrections require the addition of ten decibels to sound levels at night between 10 p.m. and 7 a.m. While the Community Noise Equivalent Level (CNEL) is similar to the L_{dn}, except that it has another addition of 4.77 dB to sound levels during the evening hours between 7 p.m. and 10 p.m. These additions are made to the sound levels at these times because during the evening and nighttime hours, when compared to daytime hours, there is a decrease in the ambient noise levels, which creates an increased sensitivity to sounds. For this reason the sound is perceived to be louder in the evening and nighttime hours and is weighted accordingly. Many cities rely on the CNEL noise standard to assess transportation-related impacts on noise sensitive land uses.

Noise measurements were taken to represent existing ambient noise levels at land uses that may be affected by the conversion of the existing pedestrian only streets into complete streets, thereby allowing vehicle access.

As shown in Figure 5-1 (see appendix), Noise Measurement 1 (NM1) was taken at the intersection of two streets that currently allow vehicle access (Broadway Street and Fresno Street). Further, the intersection of Highway 99 and Fresno Street is approximately 2,375 feet to the west of this location. There is also bus service along Fresno Street. Noise Measurements 2 and 5 were taken internal to the project site where vehicle access is currently not allowed. Noise Measurement 3 was taken near Van Ness Avenue near Kern Street that currently does not allow vehicle access. Measurement 4 was taken at the western corner of the intersection of Tuolumne Street and Fulton Street, where Fulton Street dead ends into the mall and becomes “Fulton Mall.” Table 1 summarizes the results of the short-term noise monitoring conducted in the study area.

Table 1, Summary of Short-Term Measurements

Position	Land Uses	Start Time	Duration (minutes)	Measured L_{eq}
NM-1	Residential (Masten Towers)	6:24 p.m.	15	70.7
NM-2	Residential (Pacific Southwest Building) and Retail	4:30 p.m.	30	59.9
NM-3	Residential (Californian Hotel)	5:58 p.m.	15	65.7
NM-4	Office/Commercial	6:51 p.m.	15	62.5
NM-5	Office Commercial	5:09 p.m.	30	59.9

Regulatory Setting

Federal Regulations

The adverse impact of noise was officially recognized by the federal government in the Noise Control Act of 1972, which serves the three purposes listed below:

- Promulgating noise emission standards for interstate commerce.
- Assisting state and local abatement efforts.
- Promoting noise education and research.

The Federal Office of Noise Abatement and Control was initially tasked with implementing the Noise Control Act. However, the ONAC has since been eliminated, leaving the development of federal noise policies and programs to other federal agencies and interagency committees. For example, the Occupational Safety and Health Administration (OSHA) agency limits noise exposure of workers to 90 dB L_{eq} or less for 8 continuous hours or 105 dB L_{eq} or less for 1 continuous hour.

The Department of Transportation (DOT) assumed a significant role in noise control through its various operating agencies. The Federal Aviation Administration (FAA) regulates noise of aircraft and airports. Surface transportation system noise is regulated by a host of agencies, including the Federal Transit Administration (FTA). Transit noise is regulated by the federal Urban Mass Transit Administration, while freeways that are part of the interstate highway system are regulated FHWA. Finally, the federal government actively advocates that local jurisdictions use their land use regulatory authority to arrange new development in such a way that “noise sensitive” uses are either prohibited from being sited adjacent to a highway or, alternately that the developments are planned and constructed in such a manner that potential noise impacts are minimized.

Since the federal government has preempted the setting of standards for noise levels that can be emitted by the transportation sources, the City of Fresno is restricted to regulating the noise generated by the transportation system through nuisance abatement ordinances and land use planning.

State Regulations

Established in 1973, the California Department of Health Services Office of Noise Control was instrumental in developing regularity tools to control and abate noise for use by local agencies. One significant model is the “Land Use Compatibility for Community Noise Environments Matrix,” which allows the local jurisdiction to delineate compatibility of sensitive uses with various incremental levels of noise (California Department of Health, Office of Noise Control 1976).

Title 24, Chapter 1, Article 4 of the California Administrative Code (California Noise Insulation Standards) requires noise insulation in new hotels, motels, apartment houses, and dwellings (other than single-family detached housing) that provides an annual average noise level of no more than 45 dBA CNEL. When such structures are located within a 60-dBA CNEL (or greater) exterior noise contour, an acoustical analysis is required to ensure that interior levels do not exceed the 45-dBA CNEL annual threshold. In addition, Title 21, Chapter 6, Article 1 of the California Administrative Code requires that all habitable rooms, hospitals, convalescent homes, and places of worship shall have an interior CNEL of 45 dB or less due to aircraft noise.

Government Code Section 65302 mandates that the legislative body of each county and city in California adopt a noise element as part of its comprehensive general plan. The local noise element must recognize the land use compatibility guidelines published by the State Department of Health Services. The guidelines rank noise/land use compatibility in terms of normally acceptable, conditionally acceptable, normally unacceptable, and clearly unacceptable. The City of Fresno utilizes a version of these guidelines to evaluate potential noise/land use impacts.

Local Regulations

The City of Fresno is currently in the process of updating their General Plan. Draft versions of the Noise and Safety Element are available for viewing; however, they have not been adopted yet. Therefore, the 2002 General Plan standards still apply. However, the City proposes to raise the maximum noise level standards, and states the following within the General Plan Update draft-version of the Noise and Safety Element:

> Major cities in California commonly consider maximum noise levels of 65 dB to be considered "normally acceptable" for unshielded residential development including outdoor space in an urban environment; suburban communities, by contrast, prefer a 60 dB threshold. Noise levels from 65 dB to 70 dB fall within the "conditionally unacceptable" range, and those in the 70 to 75 dB range are considered "normally unacceptable."
>
> The General Plan is consistent with noise control practice in urban areas, employing 65 dB as the beginning of the "normally acceptable" range. This policy supports the development of infill residential projects, as well as nonresidential infill projects by setting a realistic, achievable threshold of impact for new development.
>
> Section 10-101 of City's Municipal Code contains the City's noise ordinance, which establishes exterior and interior noise level standards. Standards are set for ambient noise based on district type (residential, commercial, and industrial) and time of day.
>
> The ambient noise levels in the Noise Ordinance will be updated to be consistent with the General Plan after adoption. This update will need to increase the threshold in residential districts to 65 decibels and also provide standards for mixed-use districts, civic and institutional uses, and parks and open space. It should also specify maximum hourly noise levels of outdoor activity areas and indoor spaces for specified land use types; measurement standards; required noise mitigation standards for new residential development in noise-impacted environments; uniform guidelines for acoustical studies based on current professional standards; and enforcement procedures.

The City of Fresno General Plan Noise Element (2002) contains goals and policies that address noise. The following General Plan goals and policies are applicable to the proposed project:

Goal 1. Enhance the quality of life for the citizens of Fresno and plan for the projected population within the moderately expanded Fresno urban boundary in a manner which will respect physical, environmental, fiscal, economic, and social issues.

Goal 14. Protect and improve public health and safety.

H-1-a. Policy. Noise-sensitive land uses impacted by existing or projected future transportation noise sources shall include mitigation measures so that resulting noise levels do not exceed the standards shown in Table 8 (Table 4.8-6 of this section) below:

Table 2, Maximum Allowable Noise Exposure for Noise Sensitive Land Uses (Table 8 of the City of Fresno General Plan Noise Element)

Land Use[4]	Outdoor Activity Areas[1] L_{dn} dB	Interior Spaces	
		L_{dn} dB	L_{eq} dB[2]
Residential	60[3]	45	---
Transient Lodging	60[3]	45	---
Hospitals, Nursing Homes	60[3]	45	---
Theaters, Auditoriums, Music Halls	---	---	35
Churches, Meeting Halls	60[3]	---	45
Office Buildings	---	---	45
Schools, Libraries, Museums	---	---	45

Notes:
[1] Where the location of the outdoor activity area is unknown or is not applicable, the exterior noise level standard shall be applied to the property line of the receiving land use.
[2] As determined for a typical worst-case hour during periods of use.
[3] Noise levels up to 65 dB L_{dn} adjacent to the Burlington Northern Santa Fe and Union Pacific mainline tracks may be allowed by the project approving authority when it is determined that it is not possible to achieve 60 dB L_{dn} in outdoor activity areas using a practical application of the best-available noise reduction technology, and when all feasible exterior noise reduction measures have been proposed.
[4] The Planning and Development Director, on a case-by-case basis, may designate land uses other than those shown in this table to be noise-sensitive, and may require appropriate noise mitigation measures.
Source: City of Fresno General Plan Noise Element, February 2002: 163.

H-1-b. Policy. For purposes of city analyses of noise impacts, and for determining appropriate noise mitigation, a significant increase in ambient noise levels is assumed if the project causes ambient noise levels to exceed the following:

- The ambient noise level is less than 60 dB L_{dn} and the project increase noise levels by 5 dB or more.
- The ambient noise level is 60-65 dB L_{dn} and the project increases noise levels by 3 dB or more
- The ambient noise level is greater than 65 dB L_{dn} and the project increases noise levels by 1.5 dB or more.

H-1-c. Policy. The city shall review new public and private development proposals to determine conformance with the policies of this Noise Element.

H-1-d. Policy. The city shall require an acoustical analysis in those cases where a project potentially threatens to expose existing or proposed noise-sensitive land uses to excessive noise levels. The presumption of potentially excessive noise levels shall be based on the location of new noise-sensitive uses to known noise sources of staff's professional judgment that a potential for adverse noise impacts exists. Acoustical analyses shall be required early in the review process so that noise mitigation may be included in the project design. For development not subject to environmental review, the requirements for an acoustical analysis shall be implemented prior to the issuance of building permits. The requirements for the content of an acoustical analysis are established by the Planning and Development Department in conjunction with environmental health agencies.

H-1-e. Policy. The city shall develop and employ procedures to ensure that noise mitigation measures required pursuant to an acoustical analysis are implemented in the development review and building permit processes.

H-1-f. Policy. The city shall develop and employ procedures to monitor compliance with the policies of the Noise Element after completion of projects where noise mitigation measures have been required.

H-1-g. Policy. The city shall enforce the State Noise Insulation Standards (California Code of Regulations, Title 24) and Chapter 35 of the Unicom Building Code (UBC) concerning interior noise exposure for multi-family housing, hotels and motels.

H-1-h. Policy. The city shall request the California Highway Patrol, the Sheriffs, and Police Department to actively enforce the California Vehicle Code sections relating to adequate vehicle mufflers and modified exhaust systems, and sound systems in vehicles.

H-1-i. Policy. The city shall review and update the Noise Element and the Noise Ordinance to ensure that noise exposure information and specific policies and ordinances are consistent with changing conditions with the city and with noise control regulations or policies enacted after the adoption of this element.

H-1-j Policy. Noise created by new transportation noise sources, including roadway improvement projects, shall be mitigated so that resulting noise levels do not exceed the adopted standards at noise-sensitive land uses.

H-1-k. Policy. Noise-sensitive land uses impacted by stationary noise sources shall include mitigation measures so that resulting noise levels do not exceed the standards shown in Table 9 (Table 4.8-7 of this section) as follows:

Table 3: Maximum Allowable Noise Exposure-Stationary Noise Sources[1]
(Table 9 of the City of Fresno General Plan Noise Element)

Noise Descriptor	Daytime (7 a.m. to 10 p.m.)	Nighttime (10 p.m. to 7 a.m.)
Hourly Equivalent Sound Level (L_{eq}), dB	50	45
Maximum Sound Level (L_{max}), dB	70	65

Notes:
[1] As determined at the outdoor activity areas. Where the location of outdoor activity areas is unknown or not applicable, the noise exposure standard shall be applied at the property line of the receiving land use. When ambient noise levels exceed or equal the levels in this table, mitigation shall only be required to limit noise to the ambient plus five (5) dB.
Source: City of Fresno General Plan Noise Element, February 2002

H-1-l. Policy. Noise created by new proposed stationary noise sources or existing stationary noise sources which undergo modifications that may increase noise levels shall be mitigated so as not to exceed the noise level standards of Table 9 (Table 4.8-7 of this section) at noise-sensitive land uses.

H-1-m Policy. As a guideline, noise barrier (wall, earth berms, or berm/wall combinations) shall not exceed 15 feet in height as measured from the elevation of the nearest building pad. The Planning Department Director, on a case-by-case basis, may allow noise barrier heights differing from this guideline. However, resulting noise levels must satisfy the maximum allowable noise exposure standards.

City of Fresno Municipal Code

Chapter 10, Regulations Regarding Public Nuisances and Real Property Conduct and Use, Article 1, Noise Regulations, of the Fresno Municipal Code establishes excessive noise guidelines and exemptions. The following portions of the Municipal Code are applicable to the proposed project:

SEC. 10-102. - Definitions.

(b) Ambient Noise. "Ambient noise" is the all-encompassing noise associated with a given environment, being usually a composite of sounds from many sources near and far. For the purpose of this ordinance, ambient noise level is the level obtained when the noise level is averaged over a period of fifteen minutes, without inclusion of the offending noise, at the location and time of day at which a comparison with the offending noise is to be made. Where the ambient noise level is less than that designated in this section, however, the noise level specified herein shall be deemed to be the ambient noise level for that location.

Table 4, SEC. 10-102 of the Noise Ordinance of the City of Fresno

DISTRICT	TIME	SOUND LEVEL DECIBELS
Residential	10 pm to 7 am	50
Residential	7 pm to 10 pm	55
Residential	7 am to 7 pm	60
Commercial	10 pm to 7 am	60
Commercial	7 am to 10 pm	65
Industrial	anytime	70

SEC. 10-105. Excessive Noise Prohibited. No person shall make, cause, or suffer or permit to be made or caused upon any premises or upon any public street, alley, or place within the city, any sound or noise which causes discomfort or annoyance to any reasonable person of normal sensitiveness residing or working in the area, unless such noise or sound is specifically authorized by or in accordance with this article. The provisions of this section shall apply to, but shall be limited to, the control, use, and operation of the following noise sources:

(a) Radios, musical instruments, phonographs, television sets, or other machines or devices used for the amplification, production, or reproduction of sound or the human voice.

(b) Animals or fowl creating, generating, or emitting any cry or behavioral sound.

(c) Machinery or equipment, such as fans, pumps, air conditioning units, engines, turbines, compressors, generators, motors or similar devices, equipment, or apparatus.

(d) Construction equipment or work, including the operation, use or employment of pile drivers, hammers, saws, drills, derricks, hoists, or similar construction equipment or tools. This subsection shall not apply to construction equipment or work within the area bounded by the Union Pacific tracks, from Ventura to Tulare; Tulare Street, from Union Pacific tracks to Fulton Mall; Fulton Mall/Street, from Tulare to Ventura; and Ventura Street, from Fulton Street to

Union Pacific tracks. This exception shall become null and void on June 1, 2003. (Orig. Ord. 1076; Rep. and Added Ord. 72-163, 1972; Am. Ord. 2001-41, § 1, 5-20-01).

SEC. 10-107 School, Hospitals, and Churches. No person shall create any noise on any street, sidewalk, or public place adjacent to any school, institution of learning, or church while the same is in use, or adjacent to any hospital, which noise unreasonably interferes with the workings of such institution or which disturbs or unduly annoys patients in the hospital, provided conspicuous signs are displayed in such street, sidewalk, or public place indicating the presence of a school, church, or hospital. (Orig. Ord. 3667; Rep. and Added Ord. 72-163, 1972).

SEC. 10-109 Exceptions. The provisions of this article shall not apply to:

(a) Construction, repair or remodeling work accomplished pursuant to a building, electrical, plumbing, mechanical, or other construction permit issued by the city or other governmental agency, or to site preparation and grading, provided such work takes place between the hours of 7:00 a.m. and 10:00 p.m. on any day except Sunday.

(b) Emergency work.

(c) Any act or acts which are prohibited by any law of the State of California or the United States. (Added Ord. 72-163, 1972; Am. Ord. 80-171, § 74, eff. 12-26-80).

Thresholds of Significance

According to the City of Fresno, to determine whether impacts to noise are significant environmental effects, the following questions are analyzed and evaluated. Would the project result in:

a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

b) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

c) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

d) Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels?

Potential Project Impacts

Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Construction

Construction noise varies depending on the construction process, type of equipment involved, location of the construction site with respect to sensitive receptors, the schedule proposed to carry out each task (e.g., hours and days of the week) and the duration of the construction work.

Table 5 summarizes noise levels produced by construction equipment that is commonly used on roadway construction projects. Construction equipment is expected to generate noise levels ranging from 70 to 90 dB at a distance of 50 feet, and noise produced by construction equipment would be reduced over distance at a rate of about 6 dB per doubling of distance.

Table 5, Construction Equipment Noise

Equipment	Maximum Noise Level (dBA at 50 feet)
Scrapers	89
Bulldozers	85
Heavy Trucks	88
Backhoe	80
Pneumatic Tools	85
Concrete Pump	82
Source: Federal Transit Administration 1995.	

Construction equipment used on the site may be mobile or stationary. Mobile equipment (e.g., loaders, graders, dozers) moves around a construction site performing tasks in a recurring manner. Stationary equipment (e.g., air compressor, generator, concrete saw) operates in a given location for an extended period of time to perform continuous or periodic operations. Operational characteristics of heavy construction equipment are additionally typified by short periods of full power operation followed by extended periods of operation at lower power, idling, or powered-off conditions.

Site preparation involves demolition, grading, compacting, and excavating. Equipment and vehicles that may be used during site preparation would include backhoes, bulldozers, loaders, excavation equipment (e.g., graders and scrapers), pile drivers and compaction equipment. Finishing activities may include the use of pneumatic hand tools, scrapers, concrete trucks, vibrators, and haul trucks.

During construction of the project, noise from construction activities may intermittently dominate the noise environment in the immediate area of construction. As the project will be subject to Caltrans requirements and review, construction noise will also regulated by Caltrans 2010 Standard Specification Section (14-8.02 Noise Control) which states that noise levels generated during construction shall comply with applicable local, state, and federal regulations, and that all equipment shall be fitted with adequate mufflers according to the manufacturers' specifications.

No adverse noise impacts from construction are anticipated because construction would be conducted in accordance with Caltrans 2010 Standard Specification Section (14-8.02 Noise Control) and applicable local noise standards. Construction noise would be short-term and intermittent. Further, construction activities would only occur between the hours of 7:00 a.m. and 10:00 p.m. Monday through Saturdays and therefore, be exempt from the City of Fresno Noise Ordinance standards. However, to ensure construction noise impacts are minimized, mitigation measures MM NOI-1 through 4 (given below under the heading Mitigation Measures) will be incorporated.

Operation

Potential noise impacts associated with the operations of the proposed project are a result of project-generated vehicular traffic on the project vicinity roadways and from stationary noise sources associated with the proposed project.

According to the traffic study prepared for the proposed project (Fehr & Peers 2013), neither build alternative would result in an increase greater than 0.03 percent over baseline on any road segment with the exception of Fulton Street. Considering that a doubling of the existing traffic volumes would be required to achieve a 3 dB increase in ambient noise levels, implementation of the proposed project would not result in substantial increases in ambient noise levels along study area road segments, therefore, impacts to these road segments are not discussed further in this analysis. Impact analysis will be focused on the pedestrian only road segments that are proposed to be converted to "complete streets"

The proposed project would result in 210 ADT on Fulton Street between Tuolumne Street and Inyo Street at project completion and up to 2,310 ADT under cumulative plus project conditions. None of the other road segments that will be converted from pedestrian use are through streets and would only service the immediate area. Therefore, traffic volumes along these segments would be less than those projected for Fulton Street. Considering this, traffic noise modeling was only conducted for Fulton Street, as it represents the worst-case scenario.

At buildout, vehicle traffic noise along Fulton Street under Build Alternative 1 would reach up to 52.9 dBA L_{eq} (h) and 53.1 dBA CNEL respectively. Buildout noise levels under Alternative 2 would be 50.1 dBA L_{eq} (h) and 51.1 dBA CNEL respectively. Existing ambient noise levels are substantially louder than the projected existing plus project ambient noise levels (59.9-70.7 dBA L_{eq}). The greatest increase in ambient noise levels under cumulative plus project conditions would be 1 dB at the quietest location.

Modeling results (as shown in the Appendix [Table B-1 and Table C-1]) indicate that project generated traffic under both Build Alternatives would result in negligible increases in ambient noise levels and would not cause ambient noise to exceed 60 dBA at sensitive receptor locations.

Parking Lot Areas

Sources of noise from parking lots are primarily from engine and tire noise, slamming of doors, and pedestrians. A parking lot is not considered to be a serene environment and the traffic noise from the adjacent streets will provide a masking effect over the short-term, single event noise occurrences common to parking lots.

Rooftop Mechanical Equipment

As details were not available pertaining to rooftop forced air units, a reference noise level for a rooftop unit was used. Noise impacts from rooftop mechanical equipment are anticipated to be at a level of 59.5 dBA L_{eq} at a distance of 10 feet. As there are no sensitive receptors within 20 feet of the proposed buildings, impacts from noise generated by rooftop forced air units are considered to be less than significant.

Tot Lot Area

The Fulton Mall includes two tot lots — one near the corner of Fulton and Merced, the other near Fulton and Kern — that were part of the Mall's original design. In 2008, the City of Fresno used funding from State Proposition 40 and the Federal Land and Water Conservation Fund (LWCF) to improve these tot lots. The City removed the original play structures, which were in extreme disrepair, and installed new, brightly colored play equipment and a soft-fall surface in a portion of each tot lot area.

The proposed Fulton Mall Reconstruction Project involves the reintroduction of a roadway in the right-of-way on Fulton and its cross-malls, and it will not be possible to retain the Mall's tot lots in their present locations. The tot lot would be relocated to an area adjacent to Congo Alley and approximately 72 feet from the right-of-way (ROW) of Mariposa Mall (Street). The traffic noise impact to the relocated tot lot is expected to be less than 60 dBA. Mariposa Street would have less traffic volume than Fulton Street, and Fulton Street was shown to have a maximum noise level of 53.1 dBA CNEL at the building facade adjacent to the roadway. The relocated tot lot will be an additional 72 feet back from the road ROW, which would reduce noise levels further. Traffic noise impacts to the relocated tot lot would be less than significant.

A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

As previously described in above, increases in noise levels related to the proposed project would not substantially increase the existing noise environment. Similarly, noise from project-related traffic along local roadways would not significantly increase noise levels in the project area and would likewise not result in a significant impact. Therefore, impacts associated with a substantial permanent increase in ambient noise levels in the project vicinity would be less than significant.

A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

As stated above, the City's Municipal Code Section 10-109 exempts construction noise from noise standards provided that " Construction, repair or remodeling work accomplished pursuant to a building, electrical, plumbing, mechanical, or other construction permit issued by the city or other governmental agency, or to site preparation and grading, provided such work takes place between the hours of 7:00 a.m. and 10:00 p.m. on any day except Sunday. (Added Ord. 72-163, 1972; Am. Ord. 80-171, § 74, eff. 12-26-80)." However to reduce construction-related noise impacts, mitigation measures MM NOI-1 through shall be implemented. Impacts are considered to be less than significant.

Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels? Construction

The Federal Transit Administration Report[1] outlines guidelines for assessing the impact of vibration from construction activities on nearby buildings. The guidelines determine impact threshold levels that should be considered based on the age and/or condition of the structures and the level of vibration that could potentially cause damage to the structural integrity of those structures. Based on the age and/or condition of the buildings, the recommended damage thresholds range from 0.2 inches/second peak particle velocity at non-engineered timber and masonry structures to 0.5 inches/second peak particle velocity for reinforced-concrete, steel, or timber structures containing no plaster. Thus, for the purposes of this analysis, the following significance thresholds are applied to analyze the potential vibration impacts from Project construction:

- Project construction activities would cause a ground-borne vibration level to exceed 0.2 inches/second peak particle velocity at non-engineered timber and masonry structures;
- Project construction activities would cause a ground-borne vibration level to exceed 0.3 inches/second peak particle velocity at engineered concrete and masonry (no plaster) buildings;
- Project construction activities would cause a ground-borne vibration level to exceed 0.12 inches/second peak particle velocity at buildings extremely susceptible to vibration damage, such as historic buildings; or

[1] U.S. Department of Transportation, Federal Transit Administration, "Transit Noise and Vibration Impact Assessment," May 2006.

- Project construction activities would cause a ground-borne vibration level to exceed 0.5 inches/second peak particle velocity at reinforced-concrete, steel, or timber (no plaster) structures.

While long-term project operation would not include uses or activities that typically generate excessive groundborne vibration or groundborne noise levels, short-term project construction could introduce groundborne vibration to the project site and the surrounding area.

Offsite sources that may produce perceptible vibrations are usually caused by construction equipment, steel-wheeled trains, and traffic on rough roads, while smooth roads rarely produce perceptible groundborne noise or vibration (Table 7).

Table 6: Vibration Levels Generated by Construction Equipment

Equipment	**Peak Particle Velocity (inches/second) at 25 feet**	**Approximate Vibration Level (L_V) at 25 feet**
Pile driver (impact)	1.518 (upper range) 0.644 (typical)	112 104
Pile driver (sonic)	0.734 upper range 0.170 typical	105 93
Clam shovel drop (slurry wall)	0.202	94
Hydromill (slurry wall)	0.008 in soil 0.017 in rock	66 75
Vibratory Roller	0.210	94
Hoe Ram	0.089	87
Large bulldozer	0.089	87
Caisson drill	0.089	87
Loaded trucks	0.076	86
Jackhammer	0.035	79
Small bulldozer	0.003	58
Source: Transit Noise and Vibration Impact Assessment, Federal Transit Administration, May 2006.		

The primary source of vibration during project construction would likely be from a bulldozer (tractor), which would generate 0.089 inch per second PPV at 25 feet with an approximate vibration level of 87 VdB. Vibration from the bulldozer would be intermittent and not a source of continual vibration. At less than 0.1 inch/second, the bulldozer would not create vibration that would affect even the most fragile of structures. Therefore, impacts from construction vibration are considered to be less than significant.

Operation

The proposed project consists of the reconstruction of Fulton Mall as a complete street by reintroducing vehicle traffic lanes to the existing pedestrian mall. The project does not include any sources of operational vibration; no impacts are anticipated.

Mitigation Measures

The following measures would further minimize noise associated with project construction.

MM NOI 1. The construction contractor shall locate equipment staging in areas that will create the greatest distance between construction-related noise sources and noise sensitive receptors nearest the project site during all project construction.

MM NOI 2. The construction contractor shall place all stationary construction equipment so that emitted noise is directed away from the noise sensitive receptors nearest the project site, to the degree possible.

MM NOI 3. The project proponent shall mandate that the construction contractor prohibit the use of personal or commercial music or sound amplification on the project site during construction.

MM NOI 4. The construction contractor shall limit haul truck deliveries to the same hours specified for construction equipment. To the extent feasible, haul routes shall not pass sensitive land uses or residential dwellings.

References

City of Fresno General Plan 2002.

City of Fresno Municipal Code

Appendices

Appendix A Noise Measurement Data

Appendix B Tables, Tables B-1 and C-1 from NSR for Fulton Mall

Appendix C New Parcel Map

Noise Measurement Data

Noise Measurement 1	**Noise Measurement 4**
Date Time=07/10/13 18:24:00	Date Time=07/10/13 18:51:00
Duration: 15 minutes	Duration: 15 minutes
Sampling Time=1	Sampling Time=1
Record Num= 900	Record Num= 900
Leq Value=70.7	**Leq Value=62.5**
SEL Value=100.3	SEL Value=92.0
MAX Value=78.5	MAX Value=82.7
MIN Value=69.0	MIN Value=50.8
Freq Weighting=A Time Weighting=Slow	Freq Weighting=A Time Weighting=Slow
	Noise Measurement 5
Noise Measurement 2	Date Time=07/10/13 16:30:00
Date Time=07/10/13 16:30:00	Duration: 30 minutes
Duration: 30 minutes	Sampling Time=1
Sampling Time=1	Record Num= 1800
Record Num= 1800	Leq Value=59.9
Leq Value=59.9	SEL Value=92.5
SEL Value=92.5	MAX Value=74.4
MAX Value=74.4	MIN Value=54.8
MIN Value=54.8	Freq Weighting=A Time Weighting=Slow
Freq Weighting=A Time Weighting=Slow	
Noise Measurement 3	
Date Time=07/10/13 17:58:00	
Sampling Time=1	
Duration: 15 minutes	
Record Num= 900	
Leq Value=65.7	
SEL Value=95.2	
MAX Value=81.0	
MIN Value=60.1	
Freq Weighting=A Time Weighting=Slow	

Fulton Mall noise measuring location 2; L_{eq} 59.9.

Fulton Mall noise metering location 5; L_{eq} 61.3. Meter ran for 31.5 minutes; major noise source from adjacent baseball field which was active and had amplified music playing.

Appendix B Tables

Daily Roadway Segment Traffic Volumes - Baseline Plus Project Conditions

Roadway Segment	Average Daily Traffic Volumes (ADT)			Percent Increase Over Baseline	Cumulate Project Plus Project Mall Open to Traffic (ADT)
	Baseline Conditions[1]	Baseline + Project: Mall Open to Traffic	Net Change		
1. Broadway: North of Stanislaus St.	2,588	2,580	-8	0.00	13,810
2. Fulton Street: North of Stanislaus St.	2,731	2,800	69	0.03	6,360
3. Van Ness Avenue: North of Stanislaus St.	6,339	6,270	-69	-0.01	11,710
4. Fulton Street: Tuolumne St. to Inyo St.[2]	N/A	210	210	N/A	2,310
5. Van Ness Avenue: Fresno St. to Tulare St.	9,991	10,020	29	0.00	13,950
6. Van Ness Avenue: Tulare St. to Inyo St.	9,728	9,740	12	0.00	13,950
7. Van Ness Avenue: Inyo St. to Ventura Ave.	7,586	7,580	-6	0.00	13,640
8. Stanislaus Street: M Street to Van Ness Ave.	4,360	4,340	-20	0.00	14,030
9. Stanislaus Street: Broadway to E Street	6,996	7,010	14	0.00	22,010
10. Tuolumne Street: E Street to Broadway	5,586	5,600	14	0.00	5,990
11. Tuolumne Street: Van Ness Ave. to M Street	4,299	4,290	-9	0.00	5,210
12. Fresno Street: Broadway to Van Ness Ave.	14,444	14,380	-64	0.00	18,480
13. Fresno Street: Van Ness Ave. to M Street	12,150	12,080	-70	-0.01	20,050
14. Tulare Street: H Street to Van Ness Ave.	9,304	9,280	-24	0.00	18,980
15. Inyo Street: H Street to Van Ness Ave.	3,301	3,300	-1	0.00	6,120
16. Ventura Avenue: Van Ness Ave. to M Street	11,838	11,910	72	0.01	24,570

Source: Fehr & Peers, 2013.

Notes: [1]Baseline Plus Project: Pedestrian Mall alternative would have the same traffic volumes as Baseline Conditions.
[2]Fulton Street is a pedestrian mall between Tuolumne St. and Inyo St. under Baseline Conditions and Baseline Plus Project: Pedestrian Mall alternative.

Predicted Future Noise and Barrier Analysis

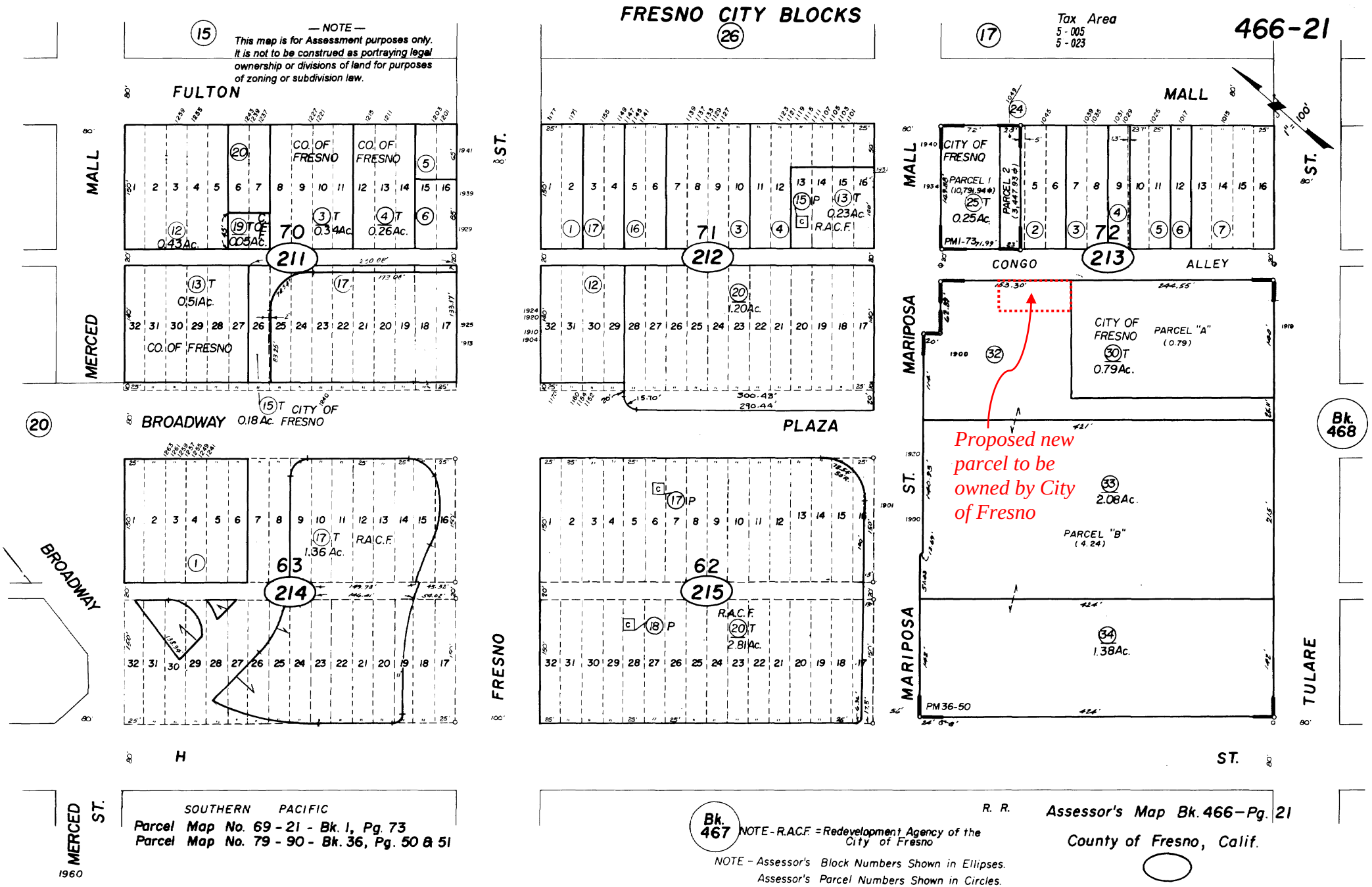
Land Use Category (See Figure 5-1)	Representative Ambient Noise Measurement Location (see Figure 5-1)	Location of Sensitive Receptors (See Figure 5-1)	Baseline Noise Level (L_{eq}(h), dBA) (Measured) See Table 6-1	Baseline Plus Project Noise Level L_{eq}(h), dBA (Modeled)	Cumulative Plus Project L_{eq}(h), dBA (Modeled)	Activity Category (NAC)	Impact Type	Noise Prediction with Barrier, Barrier Insertion Loss (I.L.), and Number of Benefited Receivers (NBR)[3]																	
								6 Feet			8 Feet			10 Feet			12 Feet			14 Feet			16 Feet		
								L_{eq} (h)	I.L.	NBR	L_{eq} (h)	I.L.	NBR	L_{eq} (h)	I.L.	NBR	L_{eq} (h)	I.L.	NBR	L_{eq} (h)	I.L.	NBR	L_{eq} (h)	I.L.	NBR
Build Alternative 1																									
B	NM1	High Density Residential at the N. corner of the intersection of Fresno Street and Broadway Pl.	70.7	n/m[4]	n/m	67 Exterior	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B	NM2	High Density Residential E. Corner of Fulton Mall and Mariposa Mall	59.9	42.5	52.9	67 Exterior	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B	NM3	S. corner of Tulare St and Fresno Mall	65.7	n/m	n/m	67 Exterior	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C	NM1	Church Approx. 300 North of NM1	70.7	42.5	52.9	67 Exterior	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B	NM3	S. corner of the intersection of Kern Street and Van Ness Avenue	65.7	n/m	n/m	67 Exterior	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C	NM2	Barber School Approx. 350' of NM1	59.9	42.5	52.9	67 Exterior	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C	NM1	Stadium	70.7	n/m	n/m	67 Exterior	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C	NM2	Outdoor Eating Area	59.9	42.5	52.9	67 Exterior	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D	NM1	Church Approx. 300 North of NM1	70.1	n/m	n/m	52 Interior[1]	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Land Use Category (See Figure 5-1)	Representative Ambient Noise Measurement Location (see Figure 5-1)	Location of Sensitive Receptors (See Figure 5-1)	Baseline Noise Level (L_{eq}(h), dBA) (Measured) See Table 6-1	Baseline Plus Project Noise Level L_{eq}(h), dBA (Modeled)	Cumulative Plus Project L_{eq}(h), dBA (Modeled)	Activity Category (NAC)	Impact Type	Noise Prediction with Barrier, Barrier Insertion Loss (I.L.), and Number of Benefited Receivers (NBR)[3]																	
								6 Feet			8 Feet			10 Feet			12 Feet			14 Feet			16 Feet		
								L_{eq} (h)	I.L.	NBR	L_{eq} (h)	I.L.	NBR	L_{eq} (h)	I.L.	NBR	L_{eq} (h)	I.L.	NBR	L_{eq} (h)	I.L.	NBR	L_{eq} (h)	I.L.	NBR
D	NM2	Barber School Approx. 350' of NM1	59.9	42.5	52.9	52 Interior[1]	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E	NM1	Varies	70.7	n/m	n/m	72 Exterior	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E	NM2	Varies	59.9	42.5	52.9	72 Exterior	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E	NM3	Varies	65.7	n/m	n/m	72 Exterior	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E	NM4	Varies	62.5	42.5	52.9	72 Exterior	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E	NM5	Varies	59.9	42.5	52.9	72 Exterior	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Build Alternative 2																									
B	NM1	High Density Residential at the N. corner of the intersection of Fresno Street and Broadway Pl.	70.7	n/m[4]	n/m	67 Exterior	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B	NM2	High Density Residential E. Corner of Fulton Mall and Mariposa Mall	59.9	40.5	50.9	67 Exterior	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B	NM3	S. corner of Tulare St and Fresno Mall	65.7	n/m	n/m	67 Exterior	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C	NM1	Church Approx. 300 North of NM1	70.7	40.5	50.9	67 Exterior	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Land Use Category (See Figure 5-1)	Representative Ambient Noise Measurement Location (see Figure 5-1)	Location of Sensitive Receptors (See Figure 5-1)	Baseline Noise Level (L_{eq}(h), dBA) (Measured) See Table 6-1	Baseline Plus Project Noise Level L_{eq}(h), dBA (Modeled)	Cumulative Plus Project L_{eq}(h), dBA (Modeled)	Activity Category (NAC)	Impact Type	Noise Prediction with Barrier, Barrier Insertion Loss (I.L.), and Number of Benefited Receivers (NBR)[3]																	
								6 Feet			8 Feet			10 Feet			12 Feet			14 Feet			16 Feet		
								L_{eq} (h)	I.L.	NBR	L_{eq} (h)	I.L.	NBR	L_{eq} (h)	I.L.	NBR	L_{eq} (h)	I.L.	NBR	L_{eq} (h)	I.L.	NBR	L_{eq} (h)	I.L.	NBR
B	NM3	S. corner of the intersection of Kern Street and Van Ness Avenue	65.7	n/m	n/m	67 Exterior	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C	NM2	Barber School Approx. 350' of NM1	59.9	40.5	50.9	67 Exterior	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C	NM1	Stadium	70.7	n/m	n/m	67 Exterior	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C	NM2	Outdoor Eating Area	59.9	40.5	50.9	67 Exterior	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D	NM1	Church Approx. 300 North of NM1	70.1	n/m	n/m	52 Interior[1]	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D	NM2	Barber School Approx. 350' of NM1	59.9	40.5	50.9	52 Interior[1]	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E	NM1	Varies	70.7	n/m	n/m	72 Exterior	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E	NM2	Varies	59.9	40.5	50.9	72 Exterior	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E	NM3	Varies	65.7	n/m	n/m	72 Exterior	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E	NM4	Varies	62.5	40.5	50.9	72 Exterior	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E	NM5	Varies	59.9	40.5	50.9	72 Exterior	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

1 Typical construction provides at least 15 dB of exterior to interior noise reduction with window open.
2 Please note that baseline plus project and Cumulative Plus Project Scenarios will not exceed the NAC therefore, no barriers are required.
3 n/m = Not Modeled. The project would not add an acoustically significant number of vehicle trips on Van Ness Avenue, Fresno Street or Broadway Place.

Appendix C Parcel Map


FRESNO CITY BLOCKS
466-21
Tax Area
5 - 005
5 - 023
— NOTE —
This map is for Assessment purposes only. It is not to be construed as portraying legal ownership or divisions of land for purposes of zoning or subdivision law.
FULTON
MALL
MERCED
BROADWAY
PLAZA
CONGO
ALLEY
MARIPOSA
TULARE
FRESNO
ST.
CO. OF FRESNO
CITY OF FRESNO
70
71
72
62
63
211
212
213
214
215
0.43Ac.
0.05Ac.
0.34Ac.
0.26Ac.
0.51Ac.
0.18Ac.
1.20Ac.
0.25Ac.
0.23Ac.
R.A.C.F.
1.36Ac.
2.81Ac.
PARCEL 1 (10,791.94#)
PARCEL 2 (3,447.93#)
PM1-73
PARCEL "A" (0.79)
0.79Ac.
2.08Ac.
PARCEL "B" (4.24)
1.38Ac.
PM36-50
Proposed new parcel to be owned by City of Fresno
Bk. 468
Bk. 467
SOUTHERN PACIFIC
Parcel Map No. 69 - 21 - Bk. 1, Pg. 73
Parcel Map No. 79 - 90 - Bk. 36, Pg. 50 & 51
NOTE - R.A.C.F. = Redevelopment Agency of the City of Fresno
NOTE - Assessor's Block Numbers Shown in Ellipses.
Assessor's Parcel Numbers Shown in Circles.
R. R.
Assessor's Map Bk. 466 - Pg. 21
County of Fresno, Calif.

Appendix J: Traffic

J.1 - Traffic Study

Final Transportation Impact Report

FULTON MALL RECONSTRUCTION PROJECT

Prepared for:

Prepared by:

FEHR PEERS

2990 Lava Ridge Court
Suite 200
Roseville, CA 95661

July 12, 2013

TABLE OF CONTENTS

EXECUTIVE SUMMARY **ES-1**
Project Description ES-1
Baseline Conditions ES-1
Baseline Plus Project Conditions ES-2
Cumulative Conditions ES-4
Cumulative Impacts ES-5

CHAPTER 1. INTRODUCTION **1**
Purpose 1
Study Area 1
Project Purpose 4
Regulatory Setting 4
California Department of Transportation (Caltrans) *4*
Fresno Council of Governments (Fresno COG) *4*
Fresno Area Express (FAX) *6*
City of Fresno *7*
Significance Criteria 9
Analysis Methodology 10
Travel Demand Forecasting *10*
Traffic Operations *10*
Analysis Assumptions and Methodology Limitations *12*

CHAPTER 2. Baseline Conditions **13**
Roadway Network 13
Traffic Volumes and Roadway Operations 14
Intersection Operations *16*
Roadway Volumes *18*
Bicycle Facilities 18
Pedestrian Facilities 19
Transit Service 21

CHAPTER 3. Baseline Plus Project **23**
Project Description 23
Project Traffic Forecasts 23
Trip Generation *23*
Traffic Distribution *24*
Project Effects on Caltrans Facilities *24*
Trip Assignment – Open to Traffic Alternatives *24*
Traffic Forecasts and Roadway Operations 25
Intersection Operations *27*
Roadway Volumes *30*

CHAPTER 4. Cumulative Conditions 31
Background 31
Project's Cumulative Effects 31
Cumulative Year Inputs 31
Cumulative Transportation Network Changes 31
Cumulative Land Use Growth 34
Cumulative No Project Conditions 35
Cumulative No Project Forecasting 35
Intersection Operations 37
Roadway Volumes 40
Cumulative Plus Project Conditions 40
Cumulative Project Traffic Forecasts 41
Intersection Operations 43
Roadway Volumes 46

CHAPTER 5. Impacts and Mitigation Measures 47
Project-Specific Impacts and Mitigation Measures 47
Cumulative Impacts 49

APPENDICES

Appendix A: References

Appendix B: Traffic Count Data

Appendix C: Technical Calculations – Baseline Conditions

Appendix D: Technical Calculations – Baseline Plus Project Conditions – Mall Open to Traffic Alternatives

Appendix E: Technical Calculations – Cumulative Conditions

Appendix F: Technical Calculations – Cumulative Plus Project Conditions – Mall Open to Traffic Alternatives

LIST OF FIGURES

Figure 1 Study Area 3

Figure 2 Peak Hour Traffic Volumes & Lane Configurations – Baseline Conditions 15

Figure 3 Intersection LOS – Baseline Conditions 17

Figure 4 Existing and Recommended Bicycle Facilities 20

Figure 5 Existing Transit Service 22

Figure 6 Peak Hour Traffic Volumes & Lane Configurations – Baseline Plus Project Conditions – Mall Open to Traffic 26

Figure 7 Intersection LOS – Baseline Plus Project Condition – Mall Open to Traffic 29

Figure 8 Peak Hour Traffic Volumes & Lane Configurations – Cumulative No Project Conditions 36

Figure 9 Intersection LOS – Cumulative No Project Conditions 39

Figure 10 Peak Hour Traffic Volumes & Lane Configurations – Cumulative Plus Project Conditions – Mall Open to Traffic 42

Figure 11 Intersection LOS – Cumulative Plus Project Condition – Mall Open to Traffic 45

LIST OF TABLES

Table 1: Level of Service Criteria – Signalized Intersections 11

Table 2: Level of Service Criteria – Unsignalized Intersections 11

Table 3: Peak Hour Intersection Operations – Baseline Conditions 16

Table 4: Daily Roadway Segment Traffic Volumes – Baseline Conditions 18

Table 5: Peak Hour Intersection Operations – Baseline Plus Project Conditions 28

Table 6: Daily Roadway Segment Traffic Volumes – Baseline Plus Project Conditions 30

Table 7: High Speed Rail Local Roadway Circulation Changes 33

Table 8: Peak Hour Intersection Operations – Cumulative No Project Conditions 38

Table 9: Daily Roadway Segment Traffic Volumes – Cumulative No Project Conditions 40

Table 10: Peak Hour Intersection Operations – Cumulative Plus Project Conditions 44

Table 11: Daily Roadway Segment Traffic Volumes – Cumulative Plus Project Conditions 46

EXECUTIVE SUMMARY

This study analyzes the transportation impacts related to the proposed Fulton Mall Reconstruction project.

PROJECT DESCRIPTION

The proposed project consists of reconstructing the existing Fulton Mall according to one of three design alternatives:

- Alternative 1: Reconnect the Grid on Traditional Streets – completely remove the existing pedestrian mall and introduce a narrow, two-lane, two-way enhanced street with oversized sidewalks, stately trees, and on-street parking throughout the Fulton Mall and its cross streets.
- Alternative 2: Reconnect the Grid with Vignettes – introduce a two-way street throughout the Fulton Mall, keeping selected features in their original Mall contexts ("vignettes"), in a manner that provides improved retail visibility and some on-street parking. Transform Kern, Mariposa, and Merced Malls into enhanced streets with narrow traffic ways, ample sidewalks, stately trees, and on-street parking.
- Alternative 3: Restoration and Completion – Keep Fulton Street, Merced Street, Mariposa Street, and Kern Street Malls pedestrian-only. Renovate and repair the pedestrian malls in their entirety, including their landscape and hardscape, and restore the artwork.

From a vehicle transportation perspective, Alternatives 1 and 2 generate similar traffic conditions by opening Fulton Mall to vehicular traffic with a narrow two-lane, two-way local serving roadway. Alternative 3 would differ from Alternatives 1 and 2 by maintaining the pedestrian-only mall. For the purposes of this study, Alternatives 1 and 2 are referred to as the "Open to Traffic" alternatives and Alternative 3 is referred to as the "Pedestrian Mall" alternative.

BASELINE CONDITIONS

AM and PM peak hour traffic counts were collected at the study intersections on weekdays between November 2009 and January 2012. While these counts were taken over the course of a little more than a two-year period, the traffic counts demonstrate that traffic volumes have roughly remained the same or slightly decreased during this time period. A review of traffic counts collected in 2009 and 2011 on the Fresno Street and Tulare Street corridors in Downtown Fresno show that traffic volumes have either stayed roughly the same or decreased by up to 20 percent, with an average decrease of about 10 percent. Therefore, using the slightly older counts from November 2009 represents similar or slightly more congested traffic conditions as those observed in 2011 and 2012.

Daily roadway traffic count data was obtained from the City of Fresno and the High Speed Rail EIR. These traffic counts were collected between March and November 2009. The baseline conditions roadway operations analysis uses roadway geometrics and traffic control as observed in Fall 2011.

Under baseline conditions, all study intersections operate at LOS D or better.

BASELINE PLUS PROJECT CONDITIONS

The proposed project would result in the following transportation impacts:

Impact B-1: The proposed project could cause potentially significant impacts to traffic operations at study intersections.

Significance: Less Than Significant

The proposed project would not significantly change traffic volumes. For the Baseline Plus Project Conditions – Pedestrian Mall alternative, traffic volumes and intersection operations would remain the same as Baseline Conditions.

For the Baseline Plus Project Conditions – Mall Open to Traffic alternatives, minor shifts in traffic patterns are expected to occur as the result of opening Fulton Mall and its cross steers to vehicular traffic. However, the proposed streets under these alternatives would primarily carry local trips to access adjacent businesses and would not greatly affect traffic volumes or traffic operations.

Table 5 shows that all study intersections would operate at LOS D or better with the proposed project.

Therefore, this impact is **less than significant**.

Impact B-2: The proposed project could cause potentially significant impacts to traffic operations and bicycle and pedestrian circulation during construction.

Significance: Potentially Significant

Construction may include disruptions to the transportation network near the site, including the possibility of temporary closures. Heavy vehicles would access the site and may need to be staged for construction. These activities could result in degraded roadway operating conditions as well as cause impacts to bicycle and pedestrian facilities along the existing Fulton Mall.

Therefore, this impact is considered **potentially significant**.

Mitigation B-2:

Prior to the beginning of construction, a construction traffic management plan shall be prepared to address potential impacts to transportation facilities. The plan shall ensure that acceptable operating conditions are maintained on local roadways as well as detours or facilities for bicyclists, pedestrians, and transit users. Implementation of this mitigation measure would reduce the above impact to **less than significant**.

Residual Significance: Less Than Significant

Impact B-3: The proposed project could cause potentially significant impacts to transit service.

Significance: Less Than Significant

The proposed project would not adversely affect existing or planned transit facilities. The proposed project would not conflict with adopted plans, policies, or programs regarding transit facilities. Therefore, this impact is considered **less than significant**.

Impact B-4: The proposed project could cause potentially significant impacts to bicycle and pedestrian facilities.

Significance: Less Than Significant

The Fulton Mall Reconstruction Project proposes either restoring the existing pedestrian mall or replacing the pedestrian mall with a new roadway. For the Pedestrian Mall alternative, the mall's existing use as a pedestrian and bicycle facility would remain. Therefore, there would be no impact to bicycle and pedestrian facilities except during construction activity (see Impact B-2).

For the Mall Open to Traffic alternatives, the Fulton Mall Reconstruction Project proposes wide pedestrian areas and a local-serving roadway carrying vehicle traffic at relatively low speeds. This would maintain the Mall as a bicycle and pedestrian friendly facility.

Since the proposed project would not adversely affect existing or planned bicycle or pedestrian networks this impact is considered **less than significant**.

Impact B-5: The proposed project could result in increased hazards due to design features.

Significance: Potentially Significant

For the Pedestrian Mall alternative, the mall would be improved to enhance accessibility and reduce hazards to pedestrians. Therefore, this impact would be less than significant under this alternative.

For the Mall Open to Traffic alternatives, vehicle traffic would be reintroduced into the corridor. Depending on the design of the roadway and the alternative selected, there is the potential for increased hazards from the interaction between travel modes (i.e., vehicles and pedestrians, vehicles and bicyclists, etc.) and the visibility (or lack thereof) of each at interaction points.

Therefore, this impact is considered **potentially significant**.

Mitigation B-5:

If one of the Mall Open to Traffic alternatives is selected, the project design shall consider issues such as design speed, sight distance, and bicycle and pedestrian treatments to enhance traveler safety. Specifically, if Alternative B (Reconnect the Grid with Vignettes) is selected, the placement of art pieces in the project design shall consider drivers' ability to see pedestrians and cyclists at likely interaction points, such as intersections and mid-block crossings.

Implementation of this mitigation measure would reduce the above impact to **less than significant**.

Residual Significance: Less Than Significant

CUMULATIVE CONDITIONS

The Cumulative Conditions analysis identifies the proposed project's incremental contribution to traffic congestion when viewed in connection with the effects of reasonably foreseeable future projects. For purposes of this study, the proposed project's incremental contribution to cumulative traffic congestion is measured by comparing the traffic analysis results of Cumulative No Project Conditions to Cumulative Plus Project Conditions.

This study uses local and regional planning and funding documents to identify the reasonably foreseeable changes to the transportation system and development patterns in the Fresno region for the cumulative conditions analysis. This study uses the Fresno Council of Governments (Fresno COG) 2035 population and employment forecasts as land use inputs for future development in the region.

This study uses the financially constrained list of transportation projects from the Fresno COG *2011 Regional Transportation Plan* (RTP) to identify future transportation improvements in the area. This study also incorporates the proposed circulation changes associated with the proposed High Speed Rail trackway project expected to begin construction in 2013.

Under Cumulative No Project Conditions, the following five intersections would operate at LOS E or F during the AM and/or PM peak hour:

- Stanislaus Street / Broadway
- Tuolumne Street / Broadway
- Fresno Street / H Street
- Fresno Street / Van Ness Avenue
- Ventura Avenue / H Street

All of these intersections are located within the Core Area, defined as the area bounded by State Routes 99, 41, and 180 in Fulton Corridor Specific Plan policy 9-3-1. Per the City of Fresno's General Plan policy MT-1-m, LOS E and F operations are acceptable at City of Fresno intersections within the Downtown Neighborhoods Community Plan area and the Fulton Corridor Specific Plan area. Therefore, all intersections are considered to operate at an acceptable level of service.

CUMULATIVE IMPACTS

Under Cumulative Plus Project Conditions, the proposed project would have the following cumulatively considerable transportation impacts:

Impact C-1: The proposed project could contribute to traffic conditions that result in significant impacts to traffic operations at study intersections.

Significance: Less Than Significant

The proposed project is anticipated to potentially stimulate and support future development in the Project Area. However, the proposed project is not expected to greatly change traffic patterns in the Study Area.

For the Pedestrian Mall alternative, traffic volumes and intersection operations would remain the same as Cumulative No Project Conditions.

For the Mall Open to Traffic alternatives, minor shifts in traffic patterns are expected to occur as the result of opening Fulton Mall to vehicular traffic. However, the proposed streets under these alternatives would primarily carry local trips to access adjacent businesses and would not greatly affect traffic volumes or traffic operations.

Table 9 shows that the following four study intersections would operate at LOS E or F during the AM and/or PM peak hour under Cumulative Plus Project Conditions with the Mall Open to Traffic alternatives:

- Stanislaus Street / Broadway
- Tuolumne Street / Broadway
- Fresno Street / H Street
- Ventura Avenue / H Street

All of these intersections are located within the Core Area, defined as the area bounded by State Routes 99, 41, and 180 in Fulton Corridor Specific Plan policy 9-3-1. Per the City of Fresno's General Plan policy MT-1-m, LOS E and F operations are acceptable at City of Fresno intersections within the Downtown Neighborhoods Community Plan area and the Fulton Corridor Specific Plan area. Therefore, all intersections are considered to operate at an acceptable level of service.

Since these intersections all operate acceptably, this impact is **less than significant**.

CHAPTER 1. INTRODUCTION

This study analyzes the transportation impacts related to the proposed Fulton Mall Reconstruction project ("proposed project"). This includes the proposed project's anticipated effects on vehicular, transit, bicycle, and pedestrian travel. The study identifies mitigation measures to address project impacts where appropriate.

PURPOSE

The analysis contained in this report provides information for the transportation section of the environmental documents being prepared for the proposed project. For the California Environmental Quality Act (CEQA), the information from this study is incorporated into the project's environmental impact report (EIR). For the National Environmental Policy Act (NEPA), the information from this study is incorporated into the project's environmental assessment (EA). The methodologies used in this study comply with applicable CEQA and NEPA guidelines and requirements.

This study analyzes the following scenarios to determine the effect of the proposed project:

- Baseline Conditions Analysis – The baseline and baseline plus project analyses are used to identify the effects directly related to the proposed project. Baseline roadway operations were analyzed using roadway geometrics as observed in Fall 2011 and traffic volumes obtained from November 2009 through January 2012.

- Cumulative Conditions Analysis – The Cumulative Conditions scenario analyzes the proposed project's incremental effects to traffic congestion when viewed in connection with the effects of reasonably foreseeable future projects. This analysis uses local land use plans and regional population and employment forecasts as land use inputs for future development in the region. The analysis also includes reasonably foreseeable roadway network changes including funded roadway improvement projects identified in the Fresno COG *2011 Regional Transportation Plan* and applicable local and regional impact fee programs.

STUDY AREA

Figure 1 shows the selected Study Area, including the proposed project location and existing transportation network.

The selected Study Area was determined through consultation with City of Fresno and Caltrans District 6 staff, the *City of Fresno Traffic Impact Study Report Guidelines* (City of Fresno, 2009), and the transportation impact analysis conducted for the Downtown Neighborhoods Community Plan (DNCP) and Fulton Corridor Specific Plan (FCSP).

Fulton Mall is located at the center of Fresno's Central Business District, and consists of six blocks bounded by Van Ness Avenue to the east, Inyo Street to the south, Broadway to the west, and Tuolumne Street to the north. The Fulton Mall project area includes a 2,670-foot long north-south pedestrian-only

mall along Fulton Street, with three shorter east-west pedestrian malls on Merced Street, Mariposa Street, and Kern Street where they cross the Fulton Mall. Together, the total linear length of the pedestrian mall complex is 4,620 feet. Fresno Street and Tulare Street carry east-west traffic through the project area with traffic signals where they cross Fulton Mall.

The following 18 study intersections and 16 roadway segments are evaluated for this analysis:

Intersections

1. Stanislaus Street / Van Ness Avenue
2. Stanislaus Street / Fulton Street
3. Stanislaus Street / Broadway
4. Tuolumne Street / Broadway
5. Tuolumne Street / Fulton Street
6. Tuolumne Street / Van Ness Avenue
7. Fresno Street / H Street
8. Fresno Street / Fulton Street
9. Fresno Street / Van Ness Avenue
10. Tulare Street / H Street
11. Tulare Street / Fulton Street
12. Tulare Street / Van Ness Avenue
13. Inyo Street / H Street
14. Inyo Street / Fulton Street
15. Inyo Street / Van Ness Avenue
16. Ventura Avenue / H Street
17. Ventura Avenue / Broadway
18. Ventura Avenue / Van Ness Avenue

Fresno Street currently travels under H Street via a grade-separated underpass. The City of Fresno intends to make this an at-grade intersection in the future. The Fresno Street / Fulton Street and Tulare Street / Fulton Street intersections are currently locations where Fulton Mall crosses these east-west streets with traffic signals to allow pedestrians to cross.

Roadway Segments

1. Broadway: North of Stanislaus St.
2. Fulton Street: North of Stanislaus St.
3. Van Ness Avenue: North of Stanislaus St.
4. Fulton Street: Tuolumne St. to Inyo St.
5. Van Ness Avenue: Fresno St. to Tulare St.
6. Van Ness Avenue: Tulare St. to Inyo St.
7. Van Ness Avenue: Inyo St. to Ventura St.
8. Stanislaus Street: M St. to Van Ness Ave.
9. Stanislaus Street: Broadway to E St.
10. Tuolumne Street: E St. to Broadway
11. Tuolumne Street: Van Ness Ave. to M St.
12. Fresno Street: Van Ness Ave. to Broadway
13. Fresno Street: H St. to Van Ness Ave.
14. Tulare Street: H St. to Van Ness Ave.
15. Inyo Street: H St. to Van Ness Ave.
16. Ventura Avenue: Van Ness Ave. to M St.

FEHR PEERS

\\Fpse03\fpse2\Data2\2010Projects\RS_Projects\RS10_2774.02\Graphics\GIS\MXD\fig01_StudyArea_mod.mxd

STUDY AREA

FIGURE 1

PROJECT PURPOSE

Per Section 1.3 of the Fulton Mall Reconstruction Draft EA, the purpose of the Fulton Mall Reconstruction project is to:

- Maximize the economic productivity of the Project Area
- Maximize mobility, circulation, and access in and around the Project Area for people using many different modes of travel
- Lower crime and improve the quality of life for living in, working in, and visiting the Project Area
- Encourage sustainable development by promoting the concentration of buildings and people in Downtown Fresno, consistent with the objectives of the draft City of Fresno 2035 General Plan

REGULATORY SETTING

This section summarizes the transportation policies, laws, and regulations that apply to the proposed project. This information provides context for the impact discussion related to the project's consistency with applicable regulatory conditions. Further, this study identifies impacts to traffic operations by comparing roadway LOS analysis results against LOS policies set forth by the City of Fresno.

California Department of Transportation (Caltrans)

The California Department of Transportation (Caltrans) is responsible for operating and maintaining the state highway system. The proposed project is located approximately ½-mile from State Routes 41 and 99, and less than one-mile from State Route 180. These state highways along with their on- and off-ramps and the intersections at ramp terminals are under Caltrans jurisdiction.

The proposed project's transportation and traffic effects would be localized to the project area and are not expected to affect Caltrans facilities.

Caltrans is the lead agency for the NEPA EA.

<u>Guide for the Preparation of Traffic Impact Studies</u>

Caltrans' *Guide for the Preparation of Traffic Impact Studies* (Caltrans, 2002) provides general guidance regarding the preparation of traffic impacts studies for projects that may have an impact on the State Highway System. The guidance includes when a traffic study should be prepared and the methodology to use when evaluating operating conditions on the State highway system.

Fresno Council of Governments (Fresno COG)

The Fresno Council of Governments (Fresno COG) is an association of local governments in Fresno County. Fresno COG provides transportation planning and funding for the region, and serves as a forum for the study and resolution of regional issues. In addition to preparing the region's long-range

transportation plan, Fresno COG assists in planning for transit, bicycle networks, clean air, and airport land uses.

2011 Fresno COG Regional Transportation Plan (RTP)

The 2011 Fresno COG *Regional Transportation Plan* (RTP) (Fresno COG, 2010) is a federally mandated long-range fiscally constrained transportation plan for Fresno County. The area is designated a federal non-attainment area for ozone, indicating that the transportation system is required to meet stringent air quality emissions targets to reduce pollutant levels that contribute to ozone formation. To receive federal funding, transportation projects nominated by cities, counties, and agencies must be consistent with the RTP.

The 2011 Fresno COG RTP also includes the following relevant goals and policies:

- Develop a regional streets and highways system that has a balanced mix of high-speed and local corridors which are functional and flexible for intermodal use.
- Integrate transportation modes through a coordinated transportation systems management process.
- Decisions on improvements to the transportation system shall take into account the effective use of all modes and facilities.
- Encourage jurisdictions to ensure that the needs of pedestrians, bicyclists, and individuals with disabilities are given special attention in the project review process.
- Encourage local jurisdictions to provide incentives to encourage transit, ridesharing, walking and bicycling.
- Manage the transportation system in a manner designed to increase operational efficiency, conserve energy and space, reduce air pollution and noise, and provide for effective goods movement, safety, personal mobility, and accessibility.
- Work closely with local land use agencies to ensure that land use planning is coordinated with transportation planning to fully mitigate the traffic impacts of new development to the greatest degree possible.
- Existing and future land use plans of the communities within the region shall be recognized in the formulation of transportation decisions.
- Encourage and support mixed land use developments that encourage a jobs/housing balance and that make alternative modes more effective.
- Monitor levels of service on the streets and highways network within Fresno County to ensure safe and efficient movement of people and goods.

- Consider development of a multimodal transportation terminal facility in, or in close proximity to, the Central Business District.
- Support the planning and construction of a High Speed Rail System in the San Joaquin Valley which directly connects the major population centers within the Valley.
- Encourage projects proposing pedestrian or transit oriented designs at suitable locations.

Fresno Bus Rapid Transit (BRT) Master Plan

The Fresno COG Bus Rapid Transit (BRT) Master Plan studies the possibility of BRT service in the Fresno-Clovis Metropolitan Area. The study recommends BRT service in the Ventura Avenue/Kings Canyon Road corridor and the Blackstone Avenue/Abby Street corridor with service routed through Downtown to connect the two corridors. In addition, the Master Plan cites previous transit studies, including the Transit Master Plan (1994), the Transit Long Range Master Plan (2001), and the Downtown Transportation and Infrastructure Study (2007).

City of Fresno Downtown Transportation and Infrastructure Study

The City of Fresno Downtown Transportation and Infrastructure Study builds upon prior planning efforts to integrate and coordinate these plans and outline a strategy to implement transportation improvements. The recommendations from this study include:

- Increasing the importance of public transit as an access mode to Downtown
- Transitioning away from pulse operations at the current Courthouse Transit Center to a more urban street corridor service with bus stops on both curb faces of Van Ness Avenue
- Implement a Downtown Circulator linking parking, outlying employment and destination sites, and the Downtown Core
- Supporting transit priority treatments, improved pedestrian facilities, and improved wayfinding in Downtown Fresno

Fresno Area Express (FAX)

The Fresno Area Express (FAX) provides public transit service within the project area. FAX operates 16 bus routes covering City of Fresno.

FAX's *Short-Range Transit Plan* (2011) is the short-term plan for transit service and transit capital improvements over the next five years. The *Short-Range Transit Plan* (SRTP) places significant emphasis on improved transit service throughout the region through a combination of infrastructure investments and service modifications. This includes the implementation of BRT service in the Blackstone Avenue/Abby Street and Ventura Avenue/Kings Canyon Road corridors, purchase of new articulated buses, transit signal prioritization, a Downtown Circulator (electric bus), and enhanced passenger amenities in Downtown.

The *Long-Range Transit Plan* (2002) identifies transit system improvements over a 20 year period. The *Long-Range Transit Plan* (LRTP) recommends increases in transit service (decreased headways) on highly utilized routes, BRT service on Blackstone Avenue, Ventura Avenue/Kings Canyon Road, and Shaw Avenue, and relocating the existing Downtown Transfer Center at Courthouse Park.

City of Fresno

The City of Fresno provides for the mobility of people and goods within the City. All of the study intersections and roadway segments for this study are within the City of Fresno's jurisdiction.

City of Fresno General Plan

The City of Fresno intends to consider the adoption of an update of the *2025 Fresno General Plan* in 2014. The Fresno General Plan Update would serve as the community's guide for the continued development, enhancement, and revitalization of the City of Fresno.

The General Plan Update includes the following policies related to transportation and circulation that are relevant to this analysis:

- **Policy MT-1-l**: Utilize to the extent feasible, a tiered system of flexible, multi-modal Level of Service standards for streets designated by the General Plan Circulation Diagram (Figure MT-1). Generally the City will strive to accommodate a peak hour vehicle LOS of "D" or better on street segments and at intersections except as further elaborated by following polices.

- **Policy MT-1-m**:Within the Downtown Neighborhoods Community Plan area and the Fulton Corridor Specific Plan area, accept motor vehicle LOS "F" conditions during peak hours on street segments and intersections in the vicinity of these areas as specified by the applicable policies of these plans.

- **Policy MT-2-a**: Provide incentives for more intense development along streets and roadways where through-traffic has been diverted to freeways and there is additional capacity.

- **Policy MT-2-c**: Provide incentives for infill development that would provide jobs and services closer to housing, and vice versa, in order to reduce citywide vehicle miles travelled (VMT).

- **Policy MT-2-d**: Along streets with excess roadway capacity where adjacent land use is not expected to change in the foreseeable future, evaluate opportunities to reduce right of way and/or re-design streets to support non-automobile travel modes.

- **Policy MT-2-f**: Optimize roadway operations by continuing to expand the use of techniques such as the City's intelligent transportation system (ITS) to manage traffic signal timing coordination in order to improve traffic operations and increase traffic carrying capacity while reducing unnecessary congestion and decreasing air pollution emissions.

- **Policy MT-4-a**: Continue to implement and periodically update a Bicycle, Pedestrian, and Trails Master Plan, which was adopted on October 28, 2010, and may be subsequently amended to meet

requirements of the California Streets and Highways Code Section 891.4, including standards and recommended improvements and funding proposals as determined appropriate and feasible.

- **Policy MT-5-d**: Minimize vehicular and pedestrian conflicts on both major and non-major streets through implementation of traffic access design and control standards addressing street intersections, median island openings and access driveways to facilitate accessibility while reducing congestion and increasing safety.
- **Policy MT-5-f**: Continue to evaluate and consider modifications to street standards to achieve overall objectives of providing good access and travel opportunities while calming traffic, promoting pedestrian and other transportation options and reducing the amount of land devoted to streets.
- **Policy MT-8-f**: Support the development of a multimodal transportation terminal facility as identified by the Downtown Neighborhoods Community Plan.

City of Fresno Traffic Impact Study Report Guidelines

The City of Fresno's *Traffic Impact Study Report Guidelines* establish general procedures and requirements for the preparation of traffic impact studies associated with development within the City of Fresno. The guidelines are intended to be a checklist to ensure regular study items are not missed, but are not intended to be prescriptive to the point of eliminating professional judgment.

The guidelines include the preferred traffic analysis methodologies, significance criteria, and documentation requirements. This study is conducted using the preferred analysis methodologies and significance criteria as outlined in the City's guidelines.

City of Fresno Bicycle, Pedestrian, & Trails Master Plan

The *City of Fresno Bicycle, Pedestrian, & Trails Master Plan* (2010) guides and influences bikeway policies, programs, and development standards to encourage bicycling in the City of Fresno. As an infrastructure plan, the contents of the *Bicycle, Pedestrian, & Trails Master Plan* are intended to be incorporated into the City's regulatory plans.

The Plan includes a variety of resources for bicycle transportation including:

- Identification of existing and planned bicycle facilities
- Goals, objectives, and policies that expand upon objectives and policies in the *2025 Fresno General Plan* and inform objectives and policies for the Fresno General Plan Update
- Encouragement, education, and enforcement programs designed to increase bicycling in Fresno
- Implementation steps for the planned bicycle network

The *Bicycle, Pedestrian, & Trails Master Plan* also includes a chapter focused on bicycle travel to and around Downtown Fresno. This chapter identifies the existing and proposed bicycle network in Downtown

Fresno, potential incentives, support facilities, and multi-modal connections to encourage cycling, and phasing for implementing bicycle facilities in Downtown.

SIGNIFICANCE CRITERIA

Based on the local and state policies and regulations listed above, the purpose and need statements in chapter 1 of the Fulton Mall Reconstruction Draft EA, and the regulatory requirements in CEQA, this study uses the following criteria to determine if the project causes a significant impact.

The proposed project may have a significant impact related to transportation and traffic if the project causes one of the following:

a. Conflict with an applicable plan, ordinance, or policy that establishes a performance standard for the circulation system, including but not limited to vehicular traffic operations at intersections, streets, highways, and freeways, pedestrian and bicycle facilities, and mass transit service.

b. Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

c. Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections)

Additional detail on significance criteria used to identify impacts caused by the proposed project related to items (a) and (b) listed above are discussed below. These criteria are based on the policies and regulations of the City of Fresno identified in the regulatory setting section.

<u>Traffic Operations</u>

Based on the policies in the City of Fresno General Plan, the City of Fresno *Traffic Impact Study Report Guidelines*, and consultation with City of Fresno Public Works staff, the proposed project would cause a significant impact to the roadway system if it would:

- Cause a City of Fresno intersection operating at an acceptable LOS to operate at an unacceptable LOS

- Increase the average delay for a City of Fresno study intersection that is already operating at an unacceptable LOS by more than five seconds

Per Policy MT-1-m in the Fresno General Plan, LOS F motor vehicle operations are acceptable for City of Fresno intersections located within the Downtown Neighborhoods Community Plan area and the Fulton Corridor Specific Plan area as specified by applicable policies of these plans. Fulton Corridor Specific Plan Policy 9-3-1 states that LOS F is allowed in the Core Area, defined as the area bounded by SR 99, 41, and 180.

The proposed project study area is within this Core Area. Therefore, LOS F vehicle traffic operations are considered acceptable for this study.

Transit, Bicycle, and Pedestrian Facilities

The City of Fresno General Plan and *Traffic Impact Study Report Guidelines* do not establish specific thresholds for impacts on transit, bicycle, and pedestrian facilities.

Based on item (b) in the significance criteria listed above, the project would cause a significant impact to the transit system, bicycle network, and/or pedestrian facilities if it would:

- Disrupt or interfere with existing or planned public transit services or facilities
- Create an inconsistency with policies concerning transit systems set forth in the *2025 Fresno General Plan* and the proposed General Plan Update or other applicable adopted policy document
- Disrupt or interfere with existing or planned bicycle/pedestrian facilities
- Result in unsafe conditions for pedestrians, including unsafe pedestrian/bicycle or pedestrian/vehicle conflicts
- Result in unsafe conditions for bicycles, including unsafe bicycle/pedestrian or bicycle/vehicle conflicts
- Create an inconsistency with policies related to bicycle or pedestrian systems set forth in the Fresno General Plan or other applicable regulatory plans

ANALYSIS METHODOLOGY

Travel Demand Forecasting

This study uses the most recently adopted Fresno COG regional travel demand forecasting (TDF) model released in 2010 to forecast plus project and cumulative traffic volumes. The base year version of the model was modified and calibrated within the study area to more accurately reflect baseline conditions. Static validation tests consistent with Caltrans' *Travel Forecasting Guidelines* (Caltrans, 1992) and FHWA's *Model Validation and Reasonableness Checking Manual* (FHWA, 1997) were completed to validate the TDF model for the study area.

Traffic Operations

This study analyzes traffic operations using level of service (LOS) as the primary measure of performance. Roadway LOS is a qualitative description of traffic flow from the perspective of motorists. The *Highway Capacity Manual* (HCM) (Transportation Research Board, 2000) defines six levels of service from LOS A representing the least congested traffic conditions to LOS F representing the most congested traffic conditions. The City of Fresno *Traffic Impact Study Report Guidelines* (2009) and Caltrans' *Guide for the Preparation of Traffic Impact Studies* (2002) recommend using the HCM methodology. Given the recent release of the 2010 HCM and current limitations in the software and application of the 2010 HCM, City of Fresno and Caltrans District 6 staff agreed on the use of the 2000 HCM methodology for this study.

Intersections

Intersection LOS is based on the control delay experienced by motorists traveling through the intersection. At signalized intersections, the LOS is determined by the average control delay per vehicle, as described in Chapter 16 of the 2000 HCM. Unsignalized intersections are evaluated using the methodology contained in Chapter 17 of the 2000 HCM. The 2000 HCM does not define an overall intersection LOS for side-street stop-controlled intersections; therefore, at side-street stop-controlled intersections, this study reports the control delay and LOS for the movement with the greatest control delay.

Tables 1 and 2 present the control delay thresholds for each LOS level for signalized and unsignalized intersections, respectively. The analysis calculates control delay and LOS at each intersection using the Synchro 7 analysis software, which is based on the 2000 HCM procedures.

TABLE 1:
LEVEL OF SERVICE CRITERIA – SIGNALIZED INTERSECTIONS

Level of Service	Average Vehicle Delay (seconds/vehicle)	Description
A	≤ 10.0	Uncongested operations; all queues clear in single cycle.
B	10.1 – 20.0	Very light congestion; an occasional phase is fully utilized.
C	20.1 – 35.0	Light congestion; occasional queues on approaches.
D	35.1 – 55.0	Significant congestion on critical approaches, but intersection is functional. Cars required to wait through more than one cycle during short peaks. No long-standing queues formed.
E	55.1 – 80.0	Severe congestion with some long-standing queues on critical approaches.
F	> 80	Total breakdown, stop-and-go conditions.

Source: *Highway Capacity Manual*, Transportation Research Board (2000).

TABLE 2:
LEVEL OF SERVICE CRITERIA – UNSIGNALIZED INTERSECTIONS

Level of Service	Average Vehicle Delay (seconds/vehicle)	Description
A	≤ 10.0	Minimal control delay.
B	10.1 – 15.0	Insignificant traffic delays.
C	15.1 – 25.0	Increased traffic delays; queues may build.
D	25.1 – 35.0	Longer traffic delays; increased queuing.
E	35.1 – 50.0	Very long traffic delays.
F	> 50	Total breakdown, stop-and-go conditions.

Source: *Highway Capacity Manual*, Transportation Research Board (2000).

Analysis Assumptions and Methodology Limitations

Key assumptions made in the process of this study include:

- Baseline traffic counts collected in the field between March 2009 and January 2012 are representative of baseline conditions.

Travel Demand Forecasting Limitations

As noted earlier, this study uses the most recently adopted Fresno COG TDF model released in 2010, and calibrated and validated the model for the project study subarea. While this makes the TDF model the most valid and capable tool for forecasting future traffic volumes, the TDF model has some limitations in its application for this study. For example, the model was designed to model traffic for regional air quality conformity, and typically only includes the regional roadway network. Additional local roadways were added to the model within the project study area to be able to generate future travel forecasts.

While the model was calibrated and is able to closely replicate baseline roadway segment volumes, the model is more limited in its ability to forecast specific turning movement volumes, particularly in a more compact grid network, such as Downtown Fresno. Drivers may choose from multiple routes in a grid system based on signal progression, congestion, and individual preferences, and may use different routes for the same trip. While the model accounts for segment level congestion, it is more limited in its ability to directly account for changes in routes due to signal operations or driver preferences. To account for some of these limitations, this study uses a process known as the "difference method" to develop turning movement forecasts. This approach adjusts raw model volume forecasts by adding the forecasted incremental growth from the TDF model to the baseline traffic counts.

Traffic Operations Limitations

This study uses analysis methodologies that are consistent with the City of Fresno's *Traffic Impact Study Report Guidelines* (2009) and Caltrans' *Guide for the Preparation of Traffic Impact Studies* (2002). However, these methodologies and the software tools consistent with these methodologies have certain limitations. For example, the 2000 HCM results from the Synchro 7 software package do not take into account additional delay or queuing that may occur due to a queue spilling out of or blocking a turn pocket at an intersection. Also, the 2000 HCM methodology does not account for any additional delay incurred by queues spilling back from adjacent intersections.

CHAPTER 2. BASELINE CONDITIONS

This chapter describes the baseline condition of the roadway, transit, bicycle, and pedestrian systems in the study area. This study uses the baseline conditions as the baseline to measure the potential impacts of proposed project.

ROADWAY NETWORK

The following describes key roadway facilities within the study area:

Fulton Street is the focal point of the proposed project. The corridor is a pedestrian mall that is closed to vehicle traffic between Tuolumne Street and Inyo Street. North of Tuolumne Street and south of Inyo Street, it is a two-lane, two-way north-south roadway. North of Divisadero Street, Fulton Street is a two-lane, one-way southbound roadway with a partial interchange with SR 180 that carries traffic into Downtown Fresno.

Van Ness Avenue is a north-south roadway that originates on the south at Railroad Avenue and travels north through the Tower District. In the project area, it is generally a two- to four-lane, two-way street. North of Divisadero Street, it transitions to a one-lane, one-way northbound roadway, connecting the project area with SR 180, the Tower District, and Fresno City College. South of the project area, it has a partial interchange with SR 41.

Stanislaus Street is a two- to three-lane one-way westbound roadway from Divisadero Street on the east to B Street on the west. It has a two-lane, westbound grade separation over the UPRR tracks and a partial interchange with SR 99.

Tuolumne Street is a two- to three-lane one-way eastbound roadway beginning at A Street on the west and terminating at Divisadero Street on the east. It has a two-lane, eastbound grade separation over the UPRR tracks.

Fresno Street is a four-lane roadway that travels along a northeast-southwest orientation in the study area. Near Fulton Mall, it is generally a four-lane divided roadway, narrowing to two lanes as it travels under a grade separated undercrossing of the UPRR tracks west of the Mall. It also has a diamond interchange with SR 99 west of the study area.

Tulare Street is an east-west roadway. In the study area, it is a four-lane, divided roadway. West of the study area, it narrows to a two-lane facility as it crosses the UPRR tracks. Tulare Street also has an interchange with SR 41 (with Divisadero Street) east of the project area.

Ventura Avenue is a four-lane, east-west arterial south of the existing Fulton Mall. It becomes West California Avenue on the southwest of the project area and Kings Canyon Road east of the project area. It also has an interchange with SR 99.

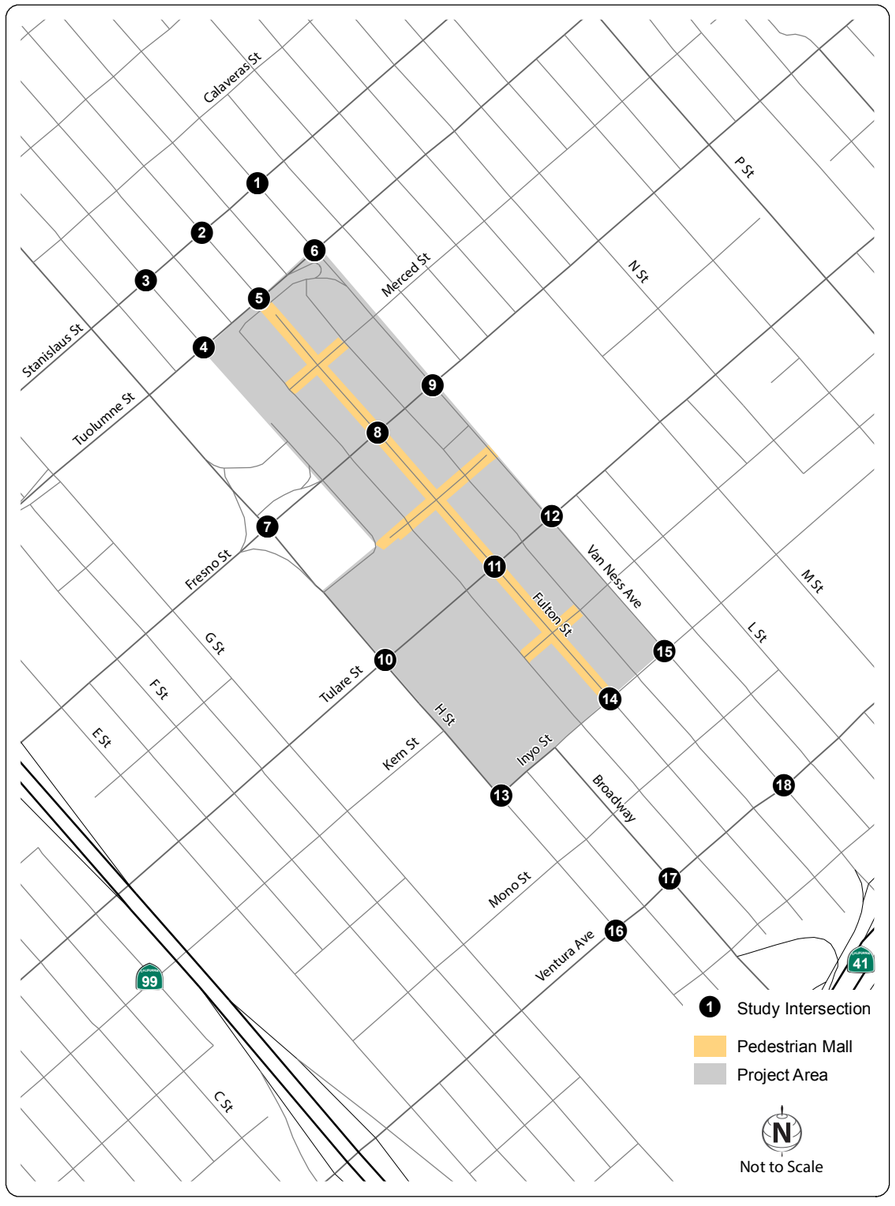
TRAFFIC VOLUMES AND ROADWAY OPERATIONS

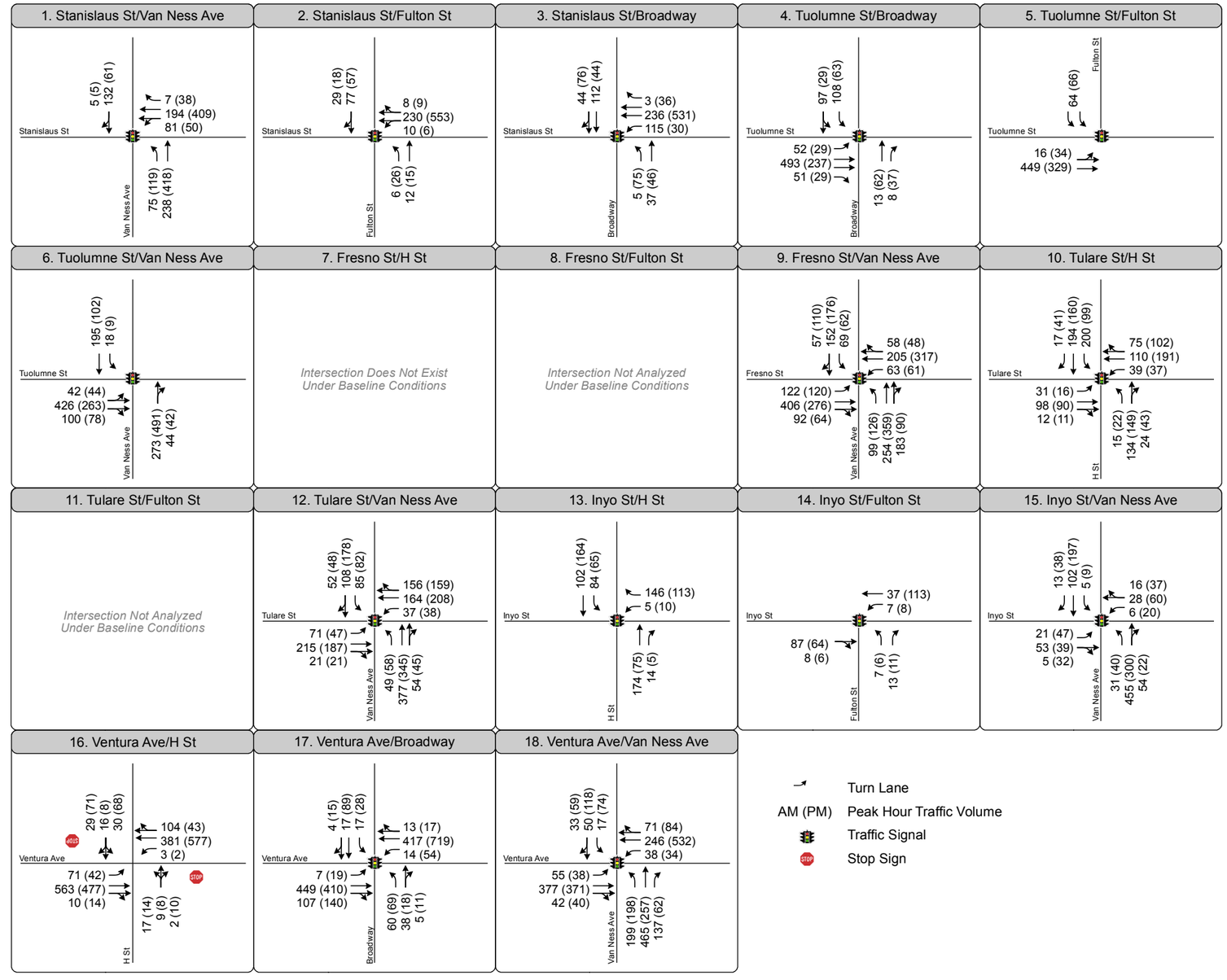
Traffic counts were collected at the study intersections on weekdays between November 2009 and January 2012 (refer to Appendix B for traffic count data). These turning movement counts at study intersections were taken during both the morning (7:00 – 9:00 am) and evening (4:00 – 6:00 pm) peak periods. While these counts were taken over the course of a little more than a two-year period, the traffic counts demonstrate that traffic volumes have roughly remained the same or slightly decreased during this time period. A review of traffic counts collected in 2009 and 2011 on the Fresno Street and Tulare Street corridors in Downtown Fresno show that traffic volumes have either stayed roughly the same or decreased by up to 20 percent, with an average decrease of about 10 percent. Therefore, using the slightly older counts from November 2009 along with the more recent traffic counts in 2011 and 2012 represent similar traffic conditions.

Daily roadway traffic count data was obtained from the City of Fresno and the High Speed Rail EIR. These traffic counts were collected between March and November 2009 (refer to Appendix B for traffic count data).

The baseline conditions roadway operations analysis uses roadway geometrics and traffic control as observed in Fall 2011.

Figure 2 provides the peak hour traffic volumes, lane configurations, and traffic control used in the baseline conditions analysis.





FEHR PEERS

Path: \\Fpse03\fpse2\Data2\2010Projects\RS_Projects\RS10_2774.02\Graphics\GIS\MXD\fig02_phtv_baseline.mxd

PEAK HOUR TRAFFIC VOLUMES AND LANE CONFIGURATIONS - BASELINE CONDITIONS

FIGURE 2

Intersection Operations

Table 3 summarizes the AM and PM peak hour level of service (LOS) at each study intersection under baseline conditions (refer to Appendix C for calculations). **Figure 3** also shows the peak hour intersection LOS. Based on the results in Table 3, all study intersections operate at LOS D or better under baseline conditions.

TABLE 3:
PEAK HOUR INTERSECTION OPERATIONS – BASELINE CONDITIONS

Intersection	Traffic Control	AM Peak Hour		PM Peak Hour	
		Delay[1]	LOS[2]	Delay[1]	LOS[2]
1. Stanislaus Street / Van Ness Avenue	Signal	11	B	13	B
2. Stanislaus Street / Fulton Street	Signal	11	B	11	B
3. Stanislaus Street / Broadway	Signal	10	A	10	B
4. Tuolumne Street / Broadway	Signal	18	B	17	B
5. Tuolumne Street / Fulton Street	Signal	12	B	11	B
6. Tuolumne Street / Van Ness Avenue	Signal	12	B	13	B
7. Fresno Street / H Street[3]	N/A				
8. Fresno Street / Fulton Street[4]	Pedestrian Signal				
9. Fresno Street / Van Ness Avenue	Signal	35	C	35	C
10. Tulare Street / H Street	Signal	12	B	11	B
11. Tulare Street / Fulton Street[4]	Pedestrian Signal				
12. Tulare Street / Van Ness Avenue	Signal	23	C	21	C
13. Inyo Street / H Street	Signal	13	B	12	B
14. Inyo Street / Fulton Street	Signal	10	A	10	B
15. Inyo Street / Van Ness Avenue	Signal	13	B	11	B
16. Ventura Avenue / H Street	Side Street Stop-Controlled	34	D	18	C
17. Ventura Avenue / Broadway	Signal	20	C	25	C
18. Ventura Avenue / Van Ness Avenue	Signal	25	C	21	C

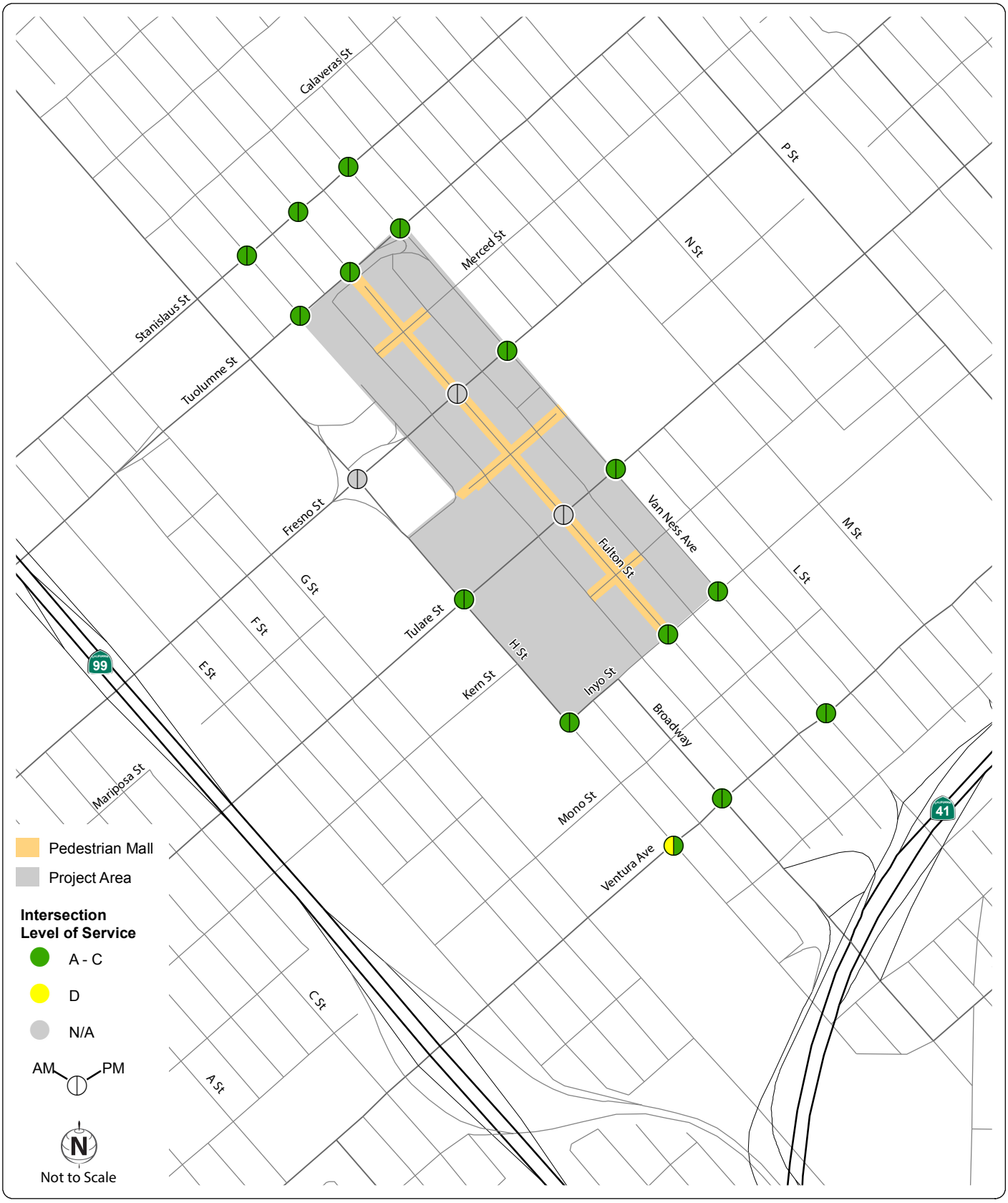
Notes: [1]For signalized intersections, the overall average intersection control delay is reported in seconds per vehicle. For side-street stop controlled intersections, the average control delay for the movement with the greatest delay is reported in seconds per vehicle.

[2]Level of Service based on *Highway Capacity Manual* (Transportation Research Board, 2000).

[3]Intersection does not exist under Baseline Conditions.

[4]Intersection currently exists as a pedestrian signal; not analyzed under Baseline Conditions.

Source: Fehr & Peers, 2013.



FEHR PEERS

INTERSECTION LEVEL OF SERVICE - BASELINE CONDITIONS

\\Fpse03\fpse2\Data2\2010Projects\RS_Projects\RS10_2774.02\Graphics\GIS\MXD\fig03_los_Baseline.mxd

FIGURE 3

Roadway Volumes

Table 4 presents the average daily traffic volumes for each study roadway segment. This study conducts a daily traffic evaluation that looks at the change in daily traffic volumes and does not conduct a detailed roadway segment LOS analysis.

TABLE 4:
DAILY ROADWAY SEGMENT TRAFFIC VOLUMES – BASELINE CONDITIONS

Roadway Segment	Facility Description	Baseline Conditions ADT[1]
1. Broadway: North of Stanislaus St.	3-lane Collector with TWLTL	2,588
2. Fulton Street: North of Stanislaus St.	2-lane Local with TWLTL	2,731
3. Van Ness Avenue: North of Stanislaus St.	2-lane Divided Collector	6,339
4. Fulton Mall: Tuolumne St. to Inyo St.[2]	Pedestrian Mall	N/A
5. Van Ness Avenue: Fresno St. to Tulare St.	3-lane Collector with TWLTL	9,991
6. Van Ness Avenue: Tulare St. to Inyo St.	3-lane Collector with TWLTL	9,728
7. Van Ness Avenue: Inyo St. to Ventura Ave.	2-lane Collector with TWLTL	7,586
8. Stanislaus Street: M Street to Van Ness Ave.	2-lane One-Way Collector	4,360
9. Stanislaus Street: Broadway to E Street	2-lane One-Way Collector	6,996
10. Tuolumne Street: E Street to Broadway	2-lane One-Way Collector	5,586
11. Tuolumne Street: Van Ness Ave. to M Street	2-lane One-Way Collector	4,299
12. Fresno Street: Broadway to Van Ness Ave.	4-lane Divided Collector	14,444
13. Fresno Street: Van Ness Ave. to M Street	4-lane Divided Collector	12,150
14. Tulare Street: H Street to Van Ness Ave.	4-lane Divided Collector	9,304
15. Inyo Street: H Street to Van Ness Ave.	2-lane Collector with TWLTL	3,301
16. Ventura Avenue: Van Ness Ave. to M Street	4-lane Divided Collector	11,838

Notes: [1]ADT = average daily traffic volumes
[2]Fulton Mall exists as a pedestrian mall that is closed to vehicular traffic.
TWLTL = two-way left-turn lane

Source: City of Fresno and High Speed Rail Authority, 2009.

BICYCLE FACILITIES

Bicycle facilities are relatively limited within the project area. Bicycle facilities can be classified into one of the following three categories:

- Class I Bike Path – Off-street bike paths within exclusive right-of-way
- Class II Bike Lane – Striped on-road bike lanes adjacent to the outside travel lane on preferred corridors for biking
- Class III Bike Route – Shared on-road facility, usually delineated by signage

According to the *City of Fresno Bicycle, Pedestrian, and Trails Master Plan* (2010) and field observations, the following Class II bike lanes are present within the study area:

- Stanislaus Street: Divisadero Street to Broadway
- Tuolumne Street: Broadway to Divisadero Street

In addition, the Fulton Mall and Mariposa Mall allow bicyclists to use the pedestrian mall as a bicycle facility.

In the vicinity of the study area, there are also Class II bike lanes located on:

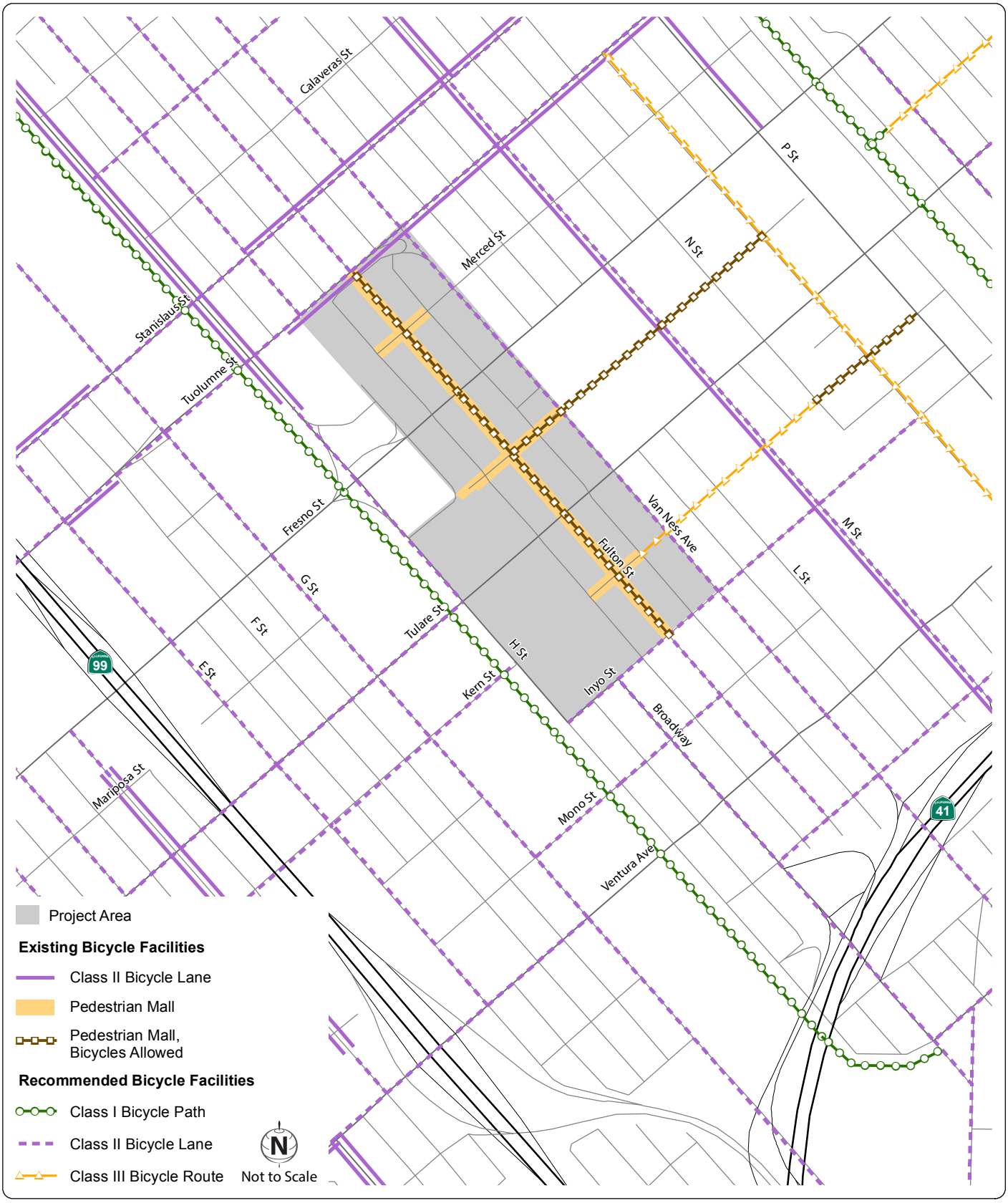
- H Street: Tuolumne Street to Divisadero Street
- M Street: Divisadero Street to San Benito Street
- P Street: Fresno Street to Divisadero Street

In addition to the existing bicycle facilities listed above, the *City of Fresno Bicycle, Pedestrian, & Trails Master Plan* (2010) identifies a recommended network of bike paths, bike lanes, and bike routes that may be implemented in the future. As noted in the regulatory setting section, the *Bicycle, Pedestrian, & Trails Master Plan* was adopted by the Fresno City Council as an infrastructure plan whose contents are intended to be incorporated into the City's regulatory plans. **Figure 4** shows the location of existing and recommended bicycle facilities in the study area as identified in the *Bicycle, Pedestrian, & Trails Master Plan*.

PEDESTRIAN FACILITIES

Within the Study Area, sidewalks are located on most streets. Southwest of the study area across the UPRR tracks, sidewalks are more intermittent.

The existing Fulton Mall along with Kern Mall, Mariposa Mall, and Merced Mall are also current pedestrian facilities within the project study area.



FEHR PEERS

\\Fpse03\fpse2\Data2\2010Projects\RS_Projects\RS10_2774.02\Graphics\GIS\MXD\fig04_bike_fac.mxd

EXISTING AND RECOMMENDED BICYCLE FACILITIES

FIGURE 4

TRANSIT SERVICE

Fresno Area Express (FAX) operates most of the bus service within the City of Fresno and Fresno-Clovis Metropolitan Area. In addition, the Fresno County Rural Transit Agency (FCRTA) provides intercity bus service connecting Downtown Fresno with outlying cities, towns, and rural areas within Fresno County.

The Downtown Transit Mall located at Courthouse Park is directly adjacent to the project area, and is a major transfer location between FAX Routes 20, 22, 26, 28, 30, 32, 34, and 38 as well as FCRTA intercity bus routes.

The following 13 fixed-route bus lines currently stop at the Downtown Transit Mall:

FAX Routes

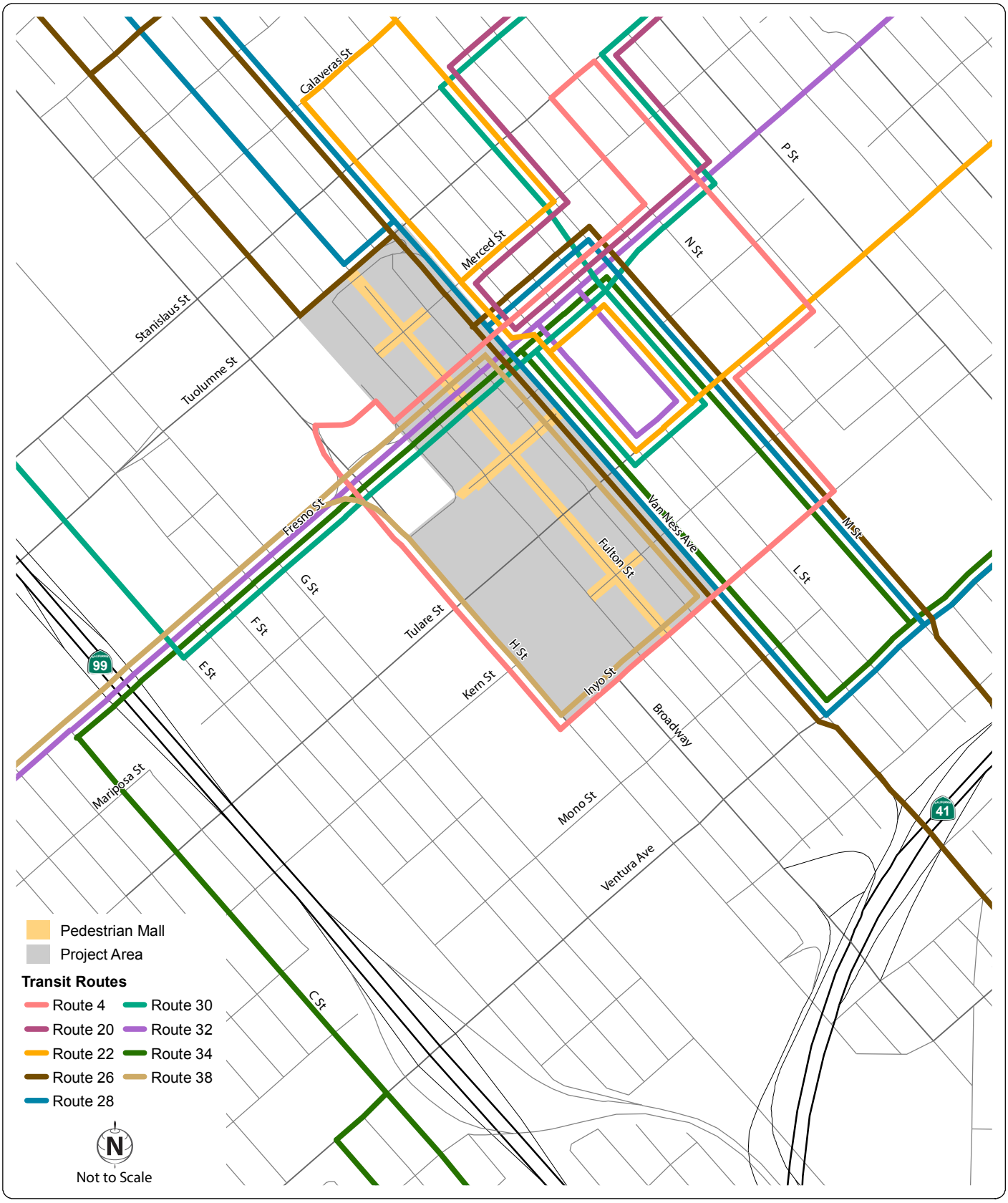
- Route 20 – Hughes Ave / Marks Ave
- Route 22 – West Ave / Tulare St
- Route 26 – Palm Ave / Butler Ave / Peach Ave
- Route 28 – CSUF / Manchester / W. Fresno
- Route 30 – Pinedale / Blackstone / W. Fresno
- Route 32 – Fresno St / Manchester / SW Fresno
- Route 33 – Belmont Ave Crosstown
- Route 34 – NE Fresno / First / SW Fresno
- Route 38 – Chukchansi Park / River Park / SW Fresno

FCRTA Routes

- Coalinga Transit – intercity fixed route service with stops in Coalinga, Huron, Five Points, Lanare, Riverdale, Caruthers, Raisin City, and Easton
- Westside Transit – intercity fixed route service with stops in Firebaugh, Mendota, and Kerman
- Southeast Transit – intercity fixed route service with stops in Fowler, Selma, and Kingsburg
- Orange Cove Transit – intercity fixed route service with stops in Sanger, Parlier, Reedley, and Orange Cove

The current configuration of the Downtown Transit Mall features three primary bus shelters: two that front Van Ness Avenue and one on Fresno Street. The bus shelters are spaced relatively far apart compared to typical transit centers that offer transfers between multiple routes.

Figure 5 presents the existing transit service in the study area.



FEHR PEERS

\\Fpse03\fpse2\Data2\2010Projects\RS_Projects\RS10_2774.02\Graphics\GIS\MXD\fig05_transit.mxd

EXISTING TRANSIT SERVICE

FIGURE 5

CHAPTER 3. BASELINE PLUS PROJECT

This chapter presents the transportation analysis for baseline plus project conditions. This scenario analyzes the impacts of the proposed project on baseline conditions.

PROJECT DESCRIPTION

The proposed project consists of reconstructing the existing Fulton Mall according to one of three design alternatives:

- Alternative 1: Reconnect the Grid on Traditional Streets – completely remove the existing pedestrian mall and introduce a narrow, two-lane, two-way enhanced street with oversized sidewalks, stately trees, and on-street parking throughout the Fulton Mall and its cross streets.
- Alternative 2: Reconnect the Grid with Vignettes – introduce a two-way street throughout the Fulton Mall, keeping selected features in their original Mall contexts ("vignettes"), in a manner that provides improved retail visibility and some on-street parking. Transform Kern, Mariposa, and Merced Malls into enhanced streets with narrow traffic ways, ample sidewalks, stately trees, and on-street parking.
- Alternative 3: Restoration and Completion – Keep Fulton Street, Merced Street, Mariposa Street, and Kern Street Malls pedestrian-only. Renovate and repair the pedestrian malls in their entirety, including their landscape and hardscape, and restore the artwork.

This study analyzes the potential transportation impacts of these three alternatives. From a vehicle transportation perspective, Alternatives 1 and 2 generate similar traffic conditions by opening Fulton Mall to vehicular traffic with a narrow two-lane, two-way local serving roadway. Alternative 3 would differ from Alternatives 1 and 2 by maintaining the pedestrian-only mall. For the purposes of this study, Alternatives 1 and 2 are referred to as the "Open to Traffic" alternatives and Alternative 3 is referred to as the "Pedestrian Mall" alternative.

PROJECT TRAFFIC FORECASTS

Trip Generation

The proposed project does not propose any additional traffic generating land uses. The Pedestrian Mall alternative is not expected to affect traffic volumes.

Since the Open to Traffic alternatives propose narrow, two-way vehicular streets, it is anticipated that the reintroduced roadways associated with these alternatives would serve existing traffic by providing access to existing businesses along the pedestrian malls, but would not induce additional travel upon opening.

Traffic Distribution

Open to Traffic Alternatives

The Open to Traffic alternatives may cause some shifts in local traffic patterns by opening the existing Fulton Mall and its cross streets to vehicle traffic. However, since these alternatives would create narrow, two-way vehicular streets, these new roadways would primarily carry local trips to access adjacent businesses. Therefore, these changes in traffic patterns would be localized to roadways in the project study area.

To evaluate this shift in traffic patterns, a locally validated version of the 2010 Fresno COG TDF model was used to estimate the re-distribution of traffic in the study area. The Fresno COG TDF model confirmed that opening Fulton Mall to vehicular traffic would not affect traffic volumes outside the study area. The model also confirmed that opening the mall to vehicular traffic resulted in minor changes to traffic patterns, primarily on Fulton Street and parallel facilities, such as Van Ness Avenue.

Pedestrian Mall Alternative

The Pedestrian Mall alternative is not expected to change traffic patterns in the project area as the transportation infrastructure in the study area would remain the same. Therefore, the traffic volumes for the Pedestrian Mall alternative would be the same as Baseline Conditions.

Project Effects on Caltrans Facilities

As identified above, the proposed project does not propose any additional traffic generating land uses, and would only result in minor shifts in traffic patterns adjacent to the existing Fulton Mall with the Open to Traffic alternatives. The Fresno COG TDF model confirmed that changes in travel patterns associated with the Open to Traffic alternatives would be localized to the Fulton Mall area, and would not result in significant changes to traffic on Caltrans facilities.

The Pedestrian Mall alternative would not change traffic patterns, and therefore would also not result in significant changes to traffic on Caltrans facilities.

Trip Assignment – Open to Traffic Alternatives

The 2010 Fresno COG TDF model was used to assign project traffic to the study intersections and roadway segments based on the forecasted change in traffic distribution. To account for model error, this study adjusts project traffic forecasts using a process known as the "difference method," which adjusts raw model volume forecasts based on expected incremental growth from Baseline Conditions using the following formula:

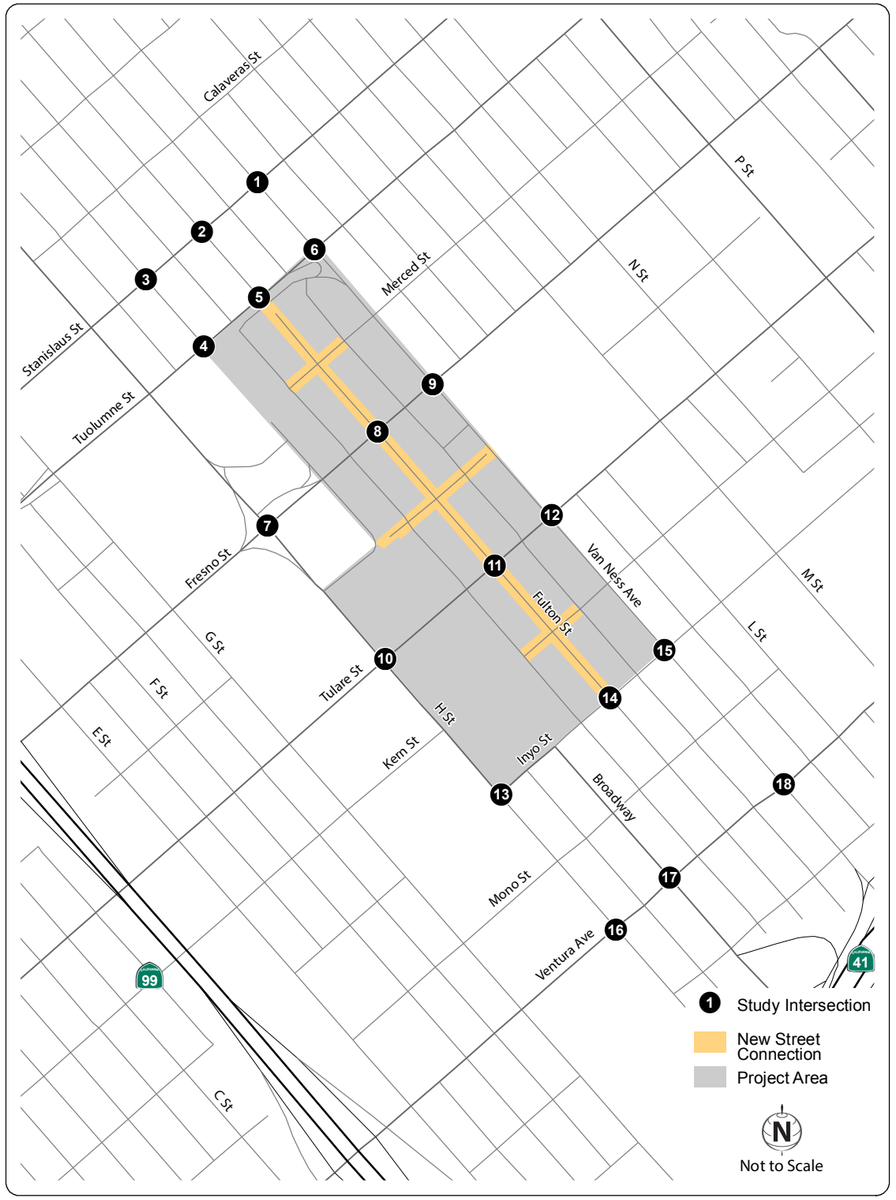
Plus Project Forecasts = Baseline Traffic Count +
(Plus Project Raw Model Volume – Base Year Raw Model Volume)

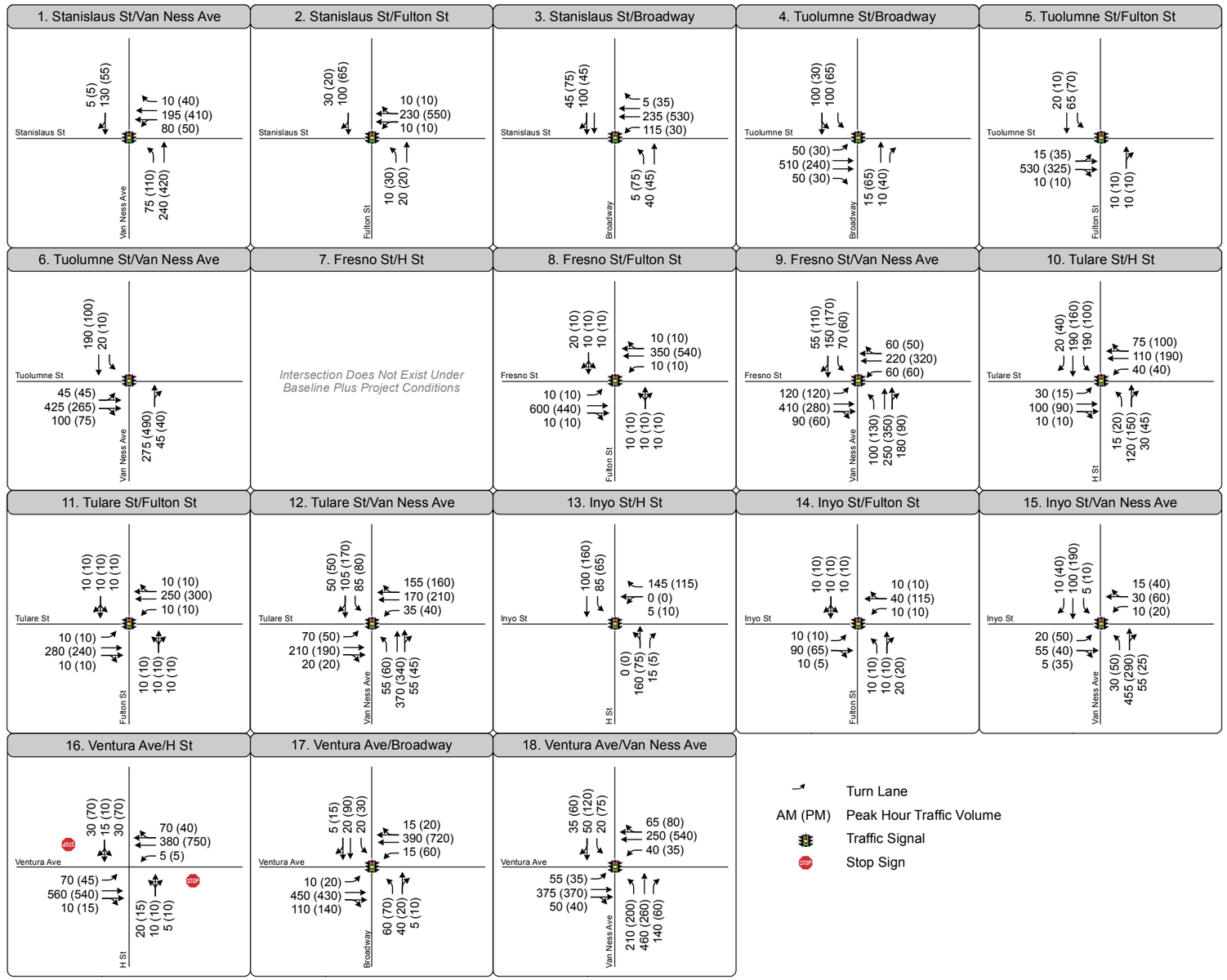
TRAFFIC FORECASTS AND ROADWAY OPERATIONS

For the Pedestrian Mall alternative, traffic volumes would remain the same as Baseline Conditions.

For the Mall Open to Traffic alternatives, minor shifts in traffic patterns are expected to occur based on the traffic distribution and assignment from the Fresno COG TDF model described above.

Figure 6 shows the peak hour Baseline Plus Project – Mall Open to Traffic forecasts at the study intersections.





FEHR PEERS

Path: \\Fpse03\fpse2\Data2\2010Projects\RS_Projects\RS10_2774.02\Graphics\GIS\MXD\fig06_phtv_BaselinePP.mxd

PEAK HOUR TRAFFIC VOLUMES AND LANE CONFIGURATIONS - BASELINE PLUS PROJECT CONDITIONS - MALL OPEN TO TRAFFIC

FIGURE 6

Intersection Operations

For the Pedestrian Mall alternative, intersection operations would remain the same as the Baseline Conditions.

For the Mall Open to Traffic alternatives, **Table 5** summarizes the AM and PM peak hour LOS at the study intersections (refer to Appendix D for calculations). **Figure 7** also shows the peak hour intersection LOS for the Mall Open to Traffic alternatives. Based on the results in Table 5, all study intersections would continue to operate at LOS D or better during the AM and PM peak hour under baseline plus project conditions with the mall open to traffic alternatives.

TABLE 5:
PEAK HOUR INTERSECTION OPERATIONS – BASELINE PLUS PROJECT CONDITIONS

Intersection	Traffic Control	Baseline Conditions[1]				Baseline + Project: Mall Open to Traffic			
		AM Peak Hr		PM Peak Hr		AM Peak Hr		PM Peak Hr	
		Delay[2]	LOS[3]	Delay[2]	LOS[3]	Delay[2]	LOS[3]	Delay[2]	LOS[3]
1. Stanislaus Street / Van Ness Avenue	Signal	11	B	13	B	11	B	13	B
2. Stanislaus Street / Fulton Street	Signal	11	B	11	B	12	B	11	B
3. Stanislaus Street / Broadway	Signal	10	A	10	B	10	A	10	B
4. Tuolumne Street / Broadway	Signal	18	B	17	B	18	B	17	B
5. Tuolumne Street / Fulton Street	Signal	12	B	11	B	12	B	11	B
6. Tuolumne Street / Van Ness Avenue	Signal	12	B	13	B	12	B	13	B
7. Fresno Street / H Street[4]	N/A								
8. Fresno Street / Fulton Street[5]	Pedestrian Signal					4	A	3	A
9. Fresno Street / Van Ness Avenue	Signal	35	C	35	C	35	C	37	D
10. Tulare Street / H Street	Signal	12	B	11	B	12	B	11	B
11. Tulare Street / Fulton Street[5]	Pedestrian Signal					4	A	4	A
12. Tulare Street / Van Ness Avenue	Signal	23	C	21	C	23	C	26	C
13. Inyo Street / H Street	Signal	13	B	12	B	12	B	11	B
14. Inyo Street / Fulton Street	Signal	10	A	10	B	9	A	9	A
15. Inyo Street / Van Ness Avenue	Signal	13	B	11	B	13	B	11	B
16. Ventura Avenue / H Street	Side Street Stop-Controlled	34	D	18	C	33	D	19	C
17. Ventura Avenue / Broadway	Signal	20	C	25	C	20	C	25	C
18. Ventura Avenue / Van Ness Avenue	Signal	25	C	21	C	25	C	21	C

Notes: [1]Baseline Plus Project: Pedestrian Mall alternative would have the same traffic operations as Baseline Conditions.

[2]For signalized intersections, the overall average intersection control delay is reported in seconds per vehicle. For side-street stop controlled intersections, the average control delay for the movement with the greatest delay is reported in seconds per vehicle.

[3]Level of Service based on *Highway Capacity Manual* (Transportation Research Board, 2000).

[4]Intersection does not exist under Baseline Conditions & Baseline Plus Project Conditions.

[5]Intersection exists as a pedestrian signal and is not analyzed under Baseline Conditions. Intersection would become fully signalized under Baseline Plus Project – Mall Open to Traffic conditions.

Source: Fehr & Peers, 2013.

FEHR PEERS

INTERSECTION LEVEL OF SERVICE - BASELINE PLUS PROJECT CONDITIONS - MALL OPEN TO TRAFFIC

\\Fpse03\fpse2\Data2\2010Projects\RS_Projects\RS10_2774.02\Graphics\GIS\MXD\fig07_los_BaselinePP.mxd

FIGURE 7

Roadway Volumes

For the Pedestrian Mall alternative, roadway volumes would remain the same as the Baseline Conditions.

For the Mall Open to Traffic alternatives, **Table 6** presents the forecasted average daily traffic volumes for each study roadway segment. The daily traffic volumes are presented to provide a general evaluation on the expected change in daily traffic patterns.

TABLE 6:
DAILY ROADWAY SEGMENT TRAFFIC VOLUMES –
BASELINE PLUS PROJECT CONDITIONS

	Average Daily Traffic Volumes	
Roadway Segment	**Baseline Conditions[1]**	**Baseline + Project: Mall Open to Traffic**
1. Broadway: North of Stanislaus St.	2,588	2,580
2. Fulton Street: North of Stanislaus St.	2,731	2,800
3. Van Ness Avenue: North of Stanislaus St.	6,339	6,270
4. Fulton Street: Tuolumne St. to Inyo St.[2]	N/A	210
5. Van Ness Avenue: Fresno St. to Tulare St.	9,991	10,020
6. Van Ness Avenue: Tulare St. to Inyo St.	9,728	9,740
7. Van Ness Avenue: Inyo St. to Ventura Ave.	7,586	7,580
8. Stanislaus Street: M Street to Van Ness Ave.	4,360	4,340
9. Stanislaus Street: Broadway to E Street	6,996	7,010
10. Tuolumne Street: E Street to Broadway	5,586	5,600
11. Tuolumne Street: Van Ness Ave. to M Street	4,299	4,290
12. Fresno Street: Broadway to Van Ness Ave.	14,444	14,380
13. Fresno Street: Van Ness Ave. to M Street	12,150	12,080
14. Tulare Street: H Street to Van Ness Ave.	9,304	9,280
15. Inyo Street: H Street to Van Ness Ave.	3,301	3,300
16. Ventura Avenue: Van Ness Ave. to M Street	11,838	11,910

Notes: [1]Baseline Plus Project: Pedestrian Mall alternative would have the same traffic volumes as Baseline Conditions.
[2]Fulton Street is a pedestrian mall between Tuolumne St. and Inyo St. under Baseline Conditions and Baseline Plus Project: Pedestrian Mall alternative.

Source: Fehr & Peers, 2013.

CHAPTER 4. CUMULATIVE CONDITIONS

This chapter presents the results of the traffic operations analysis for Cumulative Conditions. This scenario analyzes the proposed project's incremental effects to traffic and transportation when viewed in connection with the effects of reasonably foreseeable future projects.

BACKGROUND

As stated in the project purpose section of the NEPA EA and this study, the stated purposes of the proposed project include maximizing the economic productivity of the Project Area and encourage development in Downtown Fresno.

Therefore, while the proposed project may not in itself generate new traffic, the project is anticipated to potentially stimulate and support future development in the Project Area. The Cumulative Conditions analysis evaluates these potential long-term effects of the proposed project on traffic patterns in the study area.

PROJECT'S CUMULATIVE EFFECTS

For purposes of this study, the proposed project's cumulative effects are measured by comparing the traffic analysis results of Cumulative No Project Conditions to Cumulative Plus Project Conditions. This analysis evaluates the future traffic conditions with and without the proposed project in order to understand the cumulative effects of the proposed Fulton Mall Reconstruction Project.

CUMULATIVE YEAR INPUTS

Under Cumulative Conditions, this study uses local and regional planning and funding documents to identify the reasonably foreseeable changes to the transportation system and development patterns in the Fresno region. This section describes the land use and transportation inputs used for the Cumulative (Year 2035) Conditions analysis.

Cumulative Transportation Network Changes

Several changes to the transportation network are anticipated to occur throughout the Fresno region, as identified in the Fresno COG *Regional Transportation Plan*, City of Fresno traffic impact fee program nexus studies, and documents associated with the proposed California High Speed Train project.

<u>Fresno COG 2011 Regional Transportation Plan</u>

The Fresno COG 2011 *Regional Transportation Plan* (RTP) includes a financially constrained list of transportation projects for which funding has been identified or is reasonably expected to be available within the RTP planning horizon of 2035. All of these projects are included in the 2035 Fresno COG TDF model used in this cumulative conditions analysis.

Most of the projects in the Fresno COG RTP are outside the project area. Of the projects on the financially constrained project list, the following are in the project vicinity:

- Ventura Avenue: improve to 4-lane divided arterial from SR 41 to SR 99
- BRT starter line on Blackstone Avenue, Ventura Avenue/Kings Canyon Road, and through Downtown

Traffic Impact Fee Programs

The City of Fresno assesses traffic impact fees to new development projects to mitigate traffic impacts through the funding of improvements that help the City maintain adequate levels of service on its roadway network. Each new development is expected to add to the incremental need for roadway capacity and each new development would benefit from the new roadway capacity. The City has two impact fee programs related to traffic: the Fresno Major Streets Impact (FSMI) fee and the Traffic Signal Mitigation Impact (TSMI) fee.

City of Fresno Major Streets Impact (FMSI) Fee

The FSMI fee funds improvements identified in the Major Street Capital Improvement Program (Major Street CIP). In the project area, no roadways are listed in the Major Streets CIP.

Traffic Signal Mitigation Impact (TSMI) Fee

The TSMI fee funds traffic signal improvements, including new traffic signals, adding protected left-turn phasing, and modifications to existing traffic signals. The TSMI Nexus Analysis identifies the following improvements at the following study intersections:

Downtown Signal Improvements

- Stanislaus Street / Fulton Street
- Fresno Street / Fulton Mall
- Tulare Street / Fulton Mall
- Ventura Avenue / Van Ness Avenue

Fresno COG Regional Transportation Mitigation Fee (RTMF)

In addition to the City of Fresno's traffic impact fees, Fresno COG administers the Regional Transportation Mitigation Fee (RTMF), which was developed to mitigate new development's indirect regional impacts on State highway facilities in Fresno County. The fee helps fund improvements needed to maintain the target LOS in light of higher traffic volumes generated by new developments.

High Speed Rail

The California High Speed Rail Authority is proposing to construct, operate, and maintain an electric-powered high speed train system in California. In August 2011, the Authority released the Draft Environmental Impact Report (DEIR) for the Merced to Fresno and Fresno to Bakersfield project sections. The DEIR identified several roadway network changes in the City of Fresno, including road closures, new

grade separations, and road realignments. In April 2012, the Authority released the Final EIR for the Merced to Fresno section, which revised some of the DEIR roadway changes. In Fall 2012, the Authority circulated a Revised DEIR for the Fresno to Bakersfield segment for public comment.

As of May 2013, the Authority had secured Federal and State funding for an initial construction section in the Fresno area, and had selected a design-build contractor. This initial construction segment includes the high speed rail (HSR) trackway through the City of Fresno, from Madera County through Downtown Fresno. The current schedule indicates that construction would begin in 2014.

As identified in the Merced to Fresno Final EIR and Fresno to Bakersfield DEIR, this construction would result in several modifications to the local roadway network adjacent to the project area as identified in **Table 7**.

TABLE 7:
HIGH SPEED RAIL LOCAL ROADWAY CIRCULATION CHANGES

Roadway	Location	Circulation Changes
Road Closures		
Tuolumne Street	UPRR overcrossing – F Street to Broadway	- Tuolumne Street overcrossing closed; eastbound traffic moves to Stanislaus Street - New at-grade intersections at G Street and H Street - Tuolumne Street converted to a two-lane two-way street from H Street to Van Ness Avenue
Kern Street	Rail crossing – G Street to H Street	- Roadway closed; traffic shifts to adjacent crossings
Mono Street	Rail crossing – G Street to H Street	- Roadway closed; traffic shifts to adjacent crossings
Proposed Grade Separated Crossings		
Tulare Street	Rail crossing – G Street to H Street	- Proposed two-lane undercrossing of UPRR and HSR - Eliminates existing at-grade intersection at G Street
Ventura Avenue	Rail crossing – G Street to H Street	- Proposed four-lane undercrossing of UPRR and HSR - Eliminates existing at-grade intersection at G Street
Modification of Existing Grade Separations		
Stanislaus Street	Rail overcrossing – Broadway to F Street	- Proposed four-lane, two-way overcrossing; converted to a two-lane two-way street from B Street to P Street
Fresno Street	Rail undercrossing – Broadway Plaza to G Street	- Proposed four-lane undercrossing - Eliminates existing at-grade intersection at G Street - Creates new at-grade intersection at H Street

Notes: UPRR = Union Pacific Railroad
HSR = High Speed Rail

Source: California High Speed Rail Authority, 2012.

Since the initial construction section of HSR trackway in the Fresno area is funded and expected to begin construction in 2014, these changes to the local circulation system are included in the Cumulative Conditions analysis as a reasonably foreseeable probable future project.

While the initial construction section in the Fresno area is funded, it is our understanding that the Authority has only secured funding to construct the trackway from Bakersfield to Merced. The remainder of the HSR project, including the segments that connect Bakersfield to Los Angeles and from San Francisco to Merced to create the operational system proposed by the Authority, are not funded. Furthermore, plans to operate the first phase of the proposed High Speed Train between San Francisco and Los Angeles/Anaheim are not currently funded.

In addition to the funding limitations, changes to the High Speed Train business plan, projected cost, and construction schedule generate uncertainty regarding the project description, timing for completing construction, and beginning operation of the proposed high speed train system. For example, the original 2008 business plan envisioned high speed train service connecting San Francisco and Anaheim by 2020. However, the November 2011 draft business plan anticipated completion by 2033, which was then revised in the April 2012 business plan to 2028. While the original plan included high speed trains operating on dedicated right-of-way between San Francisco and Anaheim, the April 2012 business plan focuses on a blended system utilizing existing commuter rail right-of-way to lower cost and reduce construction time. The expected cost to construct the system has also changed, from the estimated $42.5 billion in the original 2008 business plan to $98.5 billion in the November 2011 draft business plan to $68.4 billion in the April 2012 business plan.

In light of these changes and lack of funding for the full proposed High Speed Train project, there is significant uncertainty regarding its ultimate implementation. Therefore, it is currently too speculative to include the operations of the California High Speed Train system as a reasonably foreseeable future project for a CEQA or NEPA analysis. As a result, this Cumulative Conditions analysis does not include the potential increase in traffic associated with passenger demand at a proposed High Speed Train station in Downtown Fresno as part of a fully functioning statewide High Speed Train system.

Cumulative Land Use Growth

The 2010 release of the Cumulative Fresno COG TDF model uses Fresno COG's 2035 population and employment forecasts as land use inputs for future development within the project area and the region. These land use inputs include projected growth in the Downtown Core, including the proposed project study area.

The City is also in the process of developing and adopting the Downtown Neighborhoods Community Plan (DNCP) and Fulton Corridor Specific Plan (FCSP). These plans would shape development and transportation in Downtown Fresno and its surrounding neighborhoods.

It is expected the development changes and transportation improvements associated with the DNCP and FCSP would ultimately occur with or without the proposed Fulton Mall Reconstruction Project. Therefore, the Cumulative Conditions analysis includes the development potential and transportation improvements associated with these plans for both the No Project and Plus Project analysis.

CUMULATIVE NO PROJECT CONDITIONS

The Cumulative No Project conditions analysis reflects anticipated conditions without the proposed Fulton Mall Reconstruction Project. This includes the cumulative transportation and land use development changes identified above, including projected development within the project area consistent with the DNCP and FCSP.

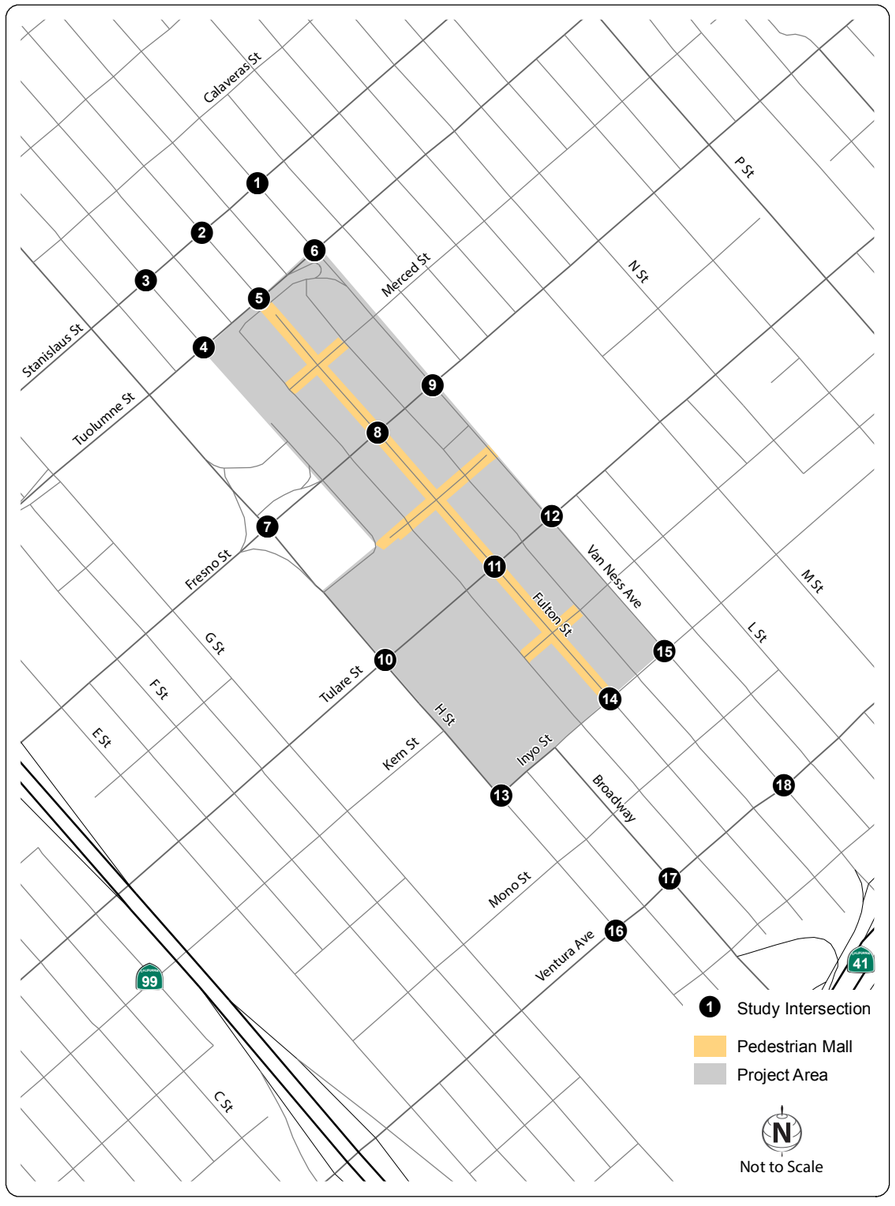
Cumulative No Project Forecasting

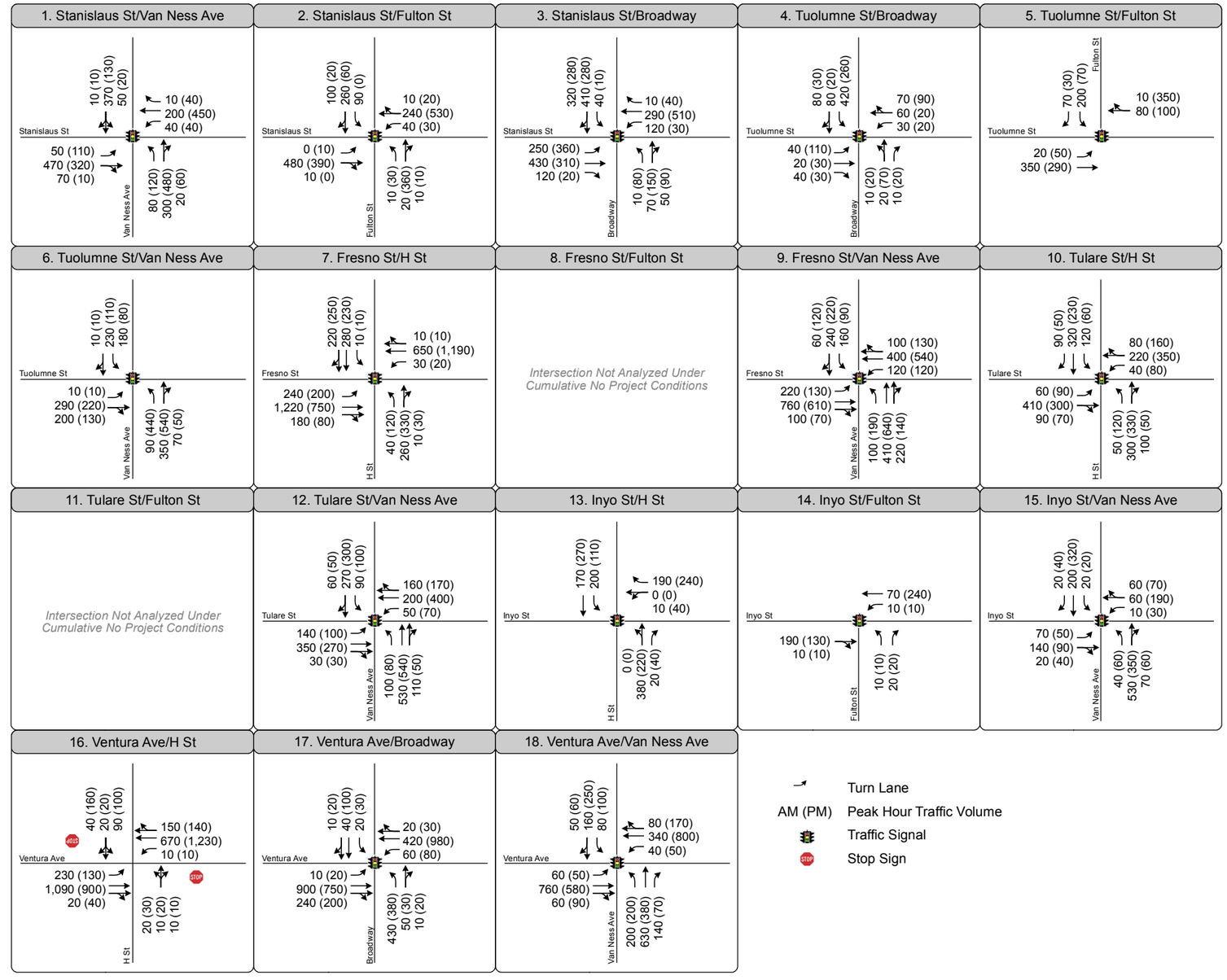
Cumulative (Year 2035) No Project weekday peak hour traffic volume forecasts were developed using a locally validated version of the Fresno COG travel demand forecasting (TDF) model. The model uses the land use and transportation inputs described above to provide travel demand forecasts for the AM and PM peak hours.

Similar to the Baseline Plus Project travel demand modeling, the Cumulative No Project turning movement forecasts were developed using the "difference method." This approach adjusts raw model volume forecasts based on expected incremental growth from Baseline Conditions using the following formula:

Cumulative No Project Forecasts = Baseline Traffic Count +
(Cumulative No Project Model Volume – Base Year Raw Model Volume)

Figure 8 shows the peak hour Cumulative No Project turning movement forecasts at the study intersections.





FEHR PEERS

Path: \\Fpse03\fpse2\Data2\2010Projects\RS_Projects\RS10_2774.02\Graphics\GIS\MXD\fig08_phtv_Cumulative.mxd

PEAK HOUR TRAFFIC VOLUMES AND LANE CONFIGURATIONS - CUMULATIVE NO PROJECT CONDITIONS

FIGURE 8

Intersection Operations

Table 8 summarizes the AM and PM peak hour level of service (LOS) at each study intersection under Cumulative No Project conditions (refer to Appendix F for calculations). **Figure 9** also shows the peak hour intersection LOS. Based on the results in Table 8, the following five intersections would operate at LOS E or F during the AM and/or PM peak hour under Cumulative No Project conditions:

- Stanislaus Street / Broadway
- Tuolumne Street / Broadway
- Fresno Street / H Street
- Fresno Street / Van Ness Avenue
- Ventura Avenue / H Street

All of these intersections are located within the Core Area, defined as the area bounded by State Routes 99, 41, and 180 in Fulton Corridor Specific Plan policy 9-3-1. Per the City of Fresno's General Plan policy MT-1-m, LOS E and F operations are acceptable at City of Fresno intersections within the Downtown Neighborhoods Community Plan area and the Fulton Corridor Specific Plan area. Therefore, all intersections are considered to operate at an acceptable level of service.

TABLE 8:
PEAK HOUR INTERSECTION OPERATIONS – CUMULATIVE NO PROJECT CONDITIONS

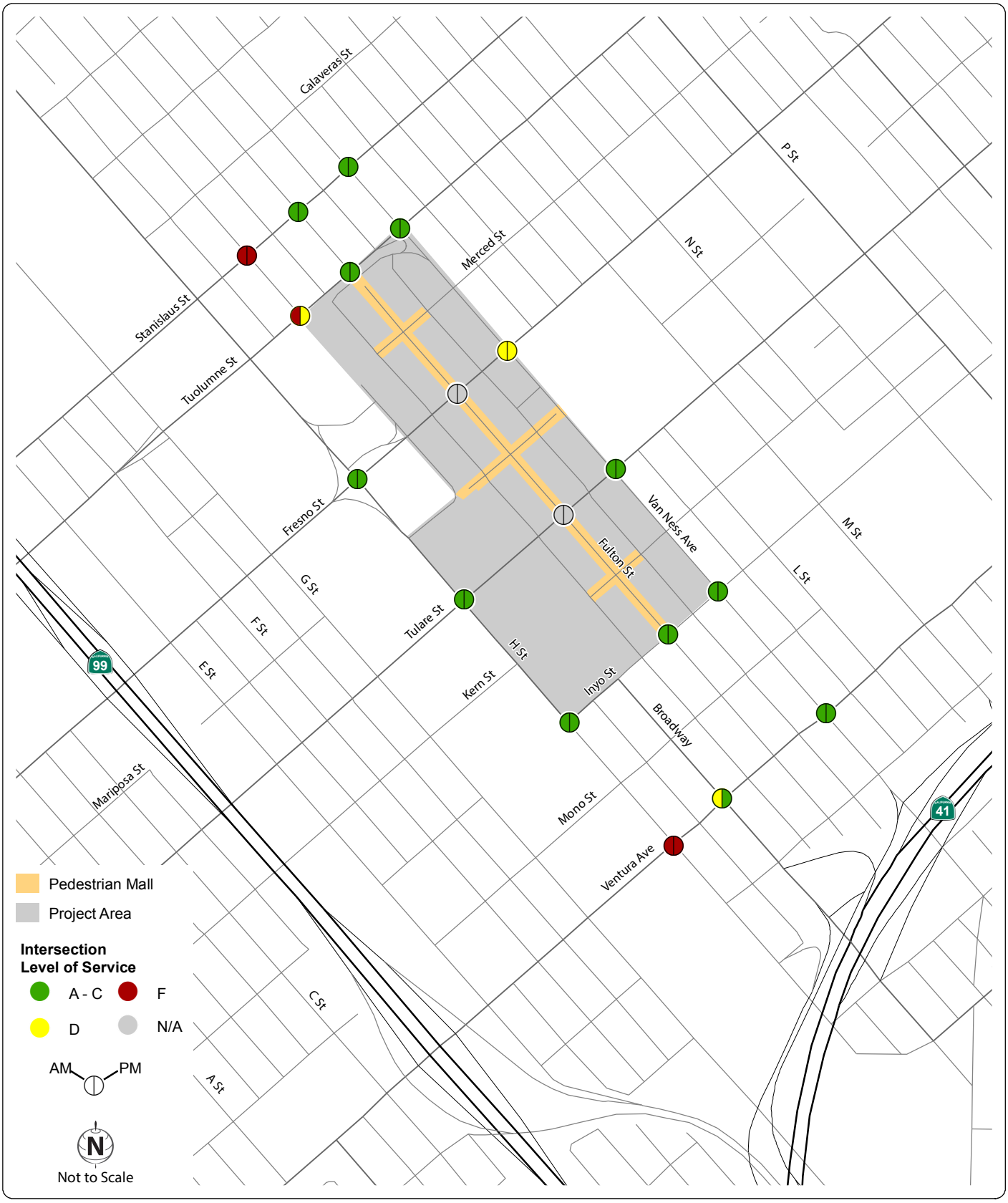
Intersection	Traffic Control	AM Peak Hour		PM Peak Hour	
		Delay[1]	LOS[2]	Delay[1]	LOS[2]
1. Stanislaus Street / Van Ness Avenue	Signal	28	C	53	D
2. Stanislaus Street / Fulton Street	Signal	18	B	16	B
3. Stanislaus Street / Broadway	Signal	50	D	>150	F
4. Tuolumne Street / Broadway	Signal	46	D	>150	F
5. Tuolumne Street / Fulton Street	Signal	22	C	19	B
6. Tuolumne Street / Van Ness Avenue	Signal	38	D	40	D
7. Fresno Street / H Street	Signal	84	F	102	F
8. Fresno Street / Fulton Street[3]	Pedestrian Signal				
9. Fresno Street / Van Ness Avenue	Signal	49	D	62	E
10. Tulare Street / H Street	Signal	14	B	27	C
11. Tulare Street / Fulton Street[3]	Pedestrian Signal				
12. Tulare Street / Van Ness Avenue	Signal	38	D	35	C
13. Inyo Street / H Street	Signal	12	B	23	C
14. Inyo Street / Fulton Street	Signal	11	B	9	A
15. Inyo Street / Van Ness Avenue	Signal	13	B	13	B
16. Ventura Avenue / H Street	Side Street Stop-Controlled	>150	F	>150	F
17. Ventura Avenue / Broadway	Signal	15	B	18	B
18. Ventura Avenue / Van Ness Avenue	Signal	29	C	32	C

Notes: [1]For signalized intersections, the overall average intersection control delay is reported in seconds per vehicle. For side-street stop controlled intersections, the average control delay for the movement with the greatest delay is reported in seconds per vehicle.

[2]Level of Service based on *Highway Capacity Manual* (Transportation Research Board, 2000).

[3]Intersection would exist as a pedestrian signal as it does under Baseline Conditions; not analyzed under Cumulative No Project Conditions.

Source: Fehr & Peers, 2013.



FEHR PEERS

INTERSECTION LEVEL OF SERVICE - CUMULATIVE NO PROJECT CONDITIONS

\\Fpse03\fpse2\Data2\2010Projects\RS_Projects\RS10_2774.02\Graphics\GIS\MXD\fig09_los_Cumulative.mxd

FIGURE 9

Roadway Volumes

Table 9 presents the forecasted average daily traffic volumes for each study roadway segment under Cumulative No Project conditions. The daily traffic volumes are presented to provide a general evaluation on the expected change in daily traffic patterns with cumulative growth.

TABLE 9:
DAILY ROADWAY SEGMENT TRAFFIC VOLUMES –
CUMULATIVE NO PROJECT CONDITIONS

	Average Daily Traffic Volumes	
Roadway Segment	**Baseline Conditions**	**Cumulative No Project**
1. Broadway: North of Stanislaus St.	2,588	13,930
2. Fulton Street: North of Stanislaus St.	2,731	6,310
3. Van Ness Avenue: North of Stanislaus St.	6,339	11,300
4. Fulton Mall: Tuolumne St. to Inyo St.[1]	N/A	N/A
5. Van Ness Avenue: Fresno St. to Tulare St.	9,991	14,280
6. Van Ness Avenue: Tulare St. to Inyo St.	9,728	13,750
7. Van Ness Avenue: Inyo St. to Ventura Ave.	7,586	13,530
8. Stanislaus Street: M Street to Van Ness Ave.	4,360	14,190
9. Stanislaus Street: Broadway to E Street	6,996	22,110
10. Tuolumne Street: E Street to Broadway	5,586	5,570
11. Tuolumne Street: Van Ness Ave. to M Street	4,299	5,290
12. Fresno Street: Broadway to Van Ness Ave.	14,444	18,420
13. Fresno Street: Van Ness Ave. to M Street	12,150	20,200
14. Tulare Street: H Street to Van Ness Ave.	9,304	18,780
15. Inyo Street: H Street to Van Ness Ave.	3,301	6,150
16. Ventura Avenue: Van Ness Ave. to M Street	11,838	24,880

Notes: [1]Fulton Mall exists as a pedestrian mall that is closed to vehicular traffic, and would remain as a pedestrian mall under Cumulative No Project conditions.

Source: Fehr & Peers, 2013.

CUMULATIVE PLUS PROJECT CONDITIONS

The Cumulative Plus Project analysis reflects future conditions with the proposed Fulton Mall Reconstruction Project. As noted in the introduction of this chapter, it is anticipated that the City will adopt the DNCP and FCSP, which will shape future development and transportation in Downtown Fresno. Therefore, the development potential and future transportation improvements are included in both the Cumulative No Project and Cumulative Plus Project analysis.

Cumulative Project Traffic Forecasts

Pedestrian Mall Alternative

As with the Baseline Plus Project analysis, the Pedestrian Mall alternative is not expected to result in different traffic conditions than the Cumulative No Project condition, since the transportation infrastructure in the study area would remain the same. Therefore, the traffic volumes for the Pedestrian Mall alternative would be the same as Cumulative No Project Conditions.

Open to Traffic Alternatives

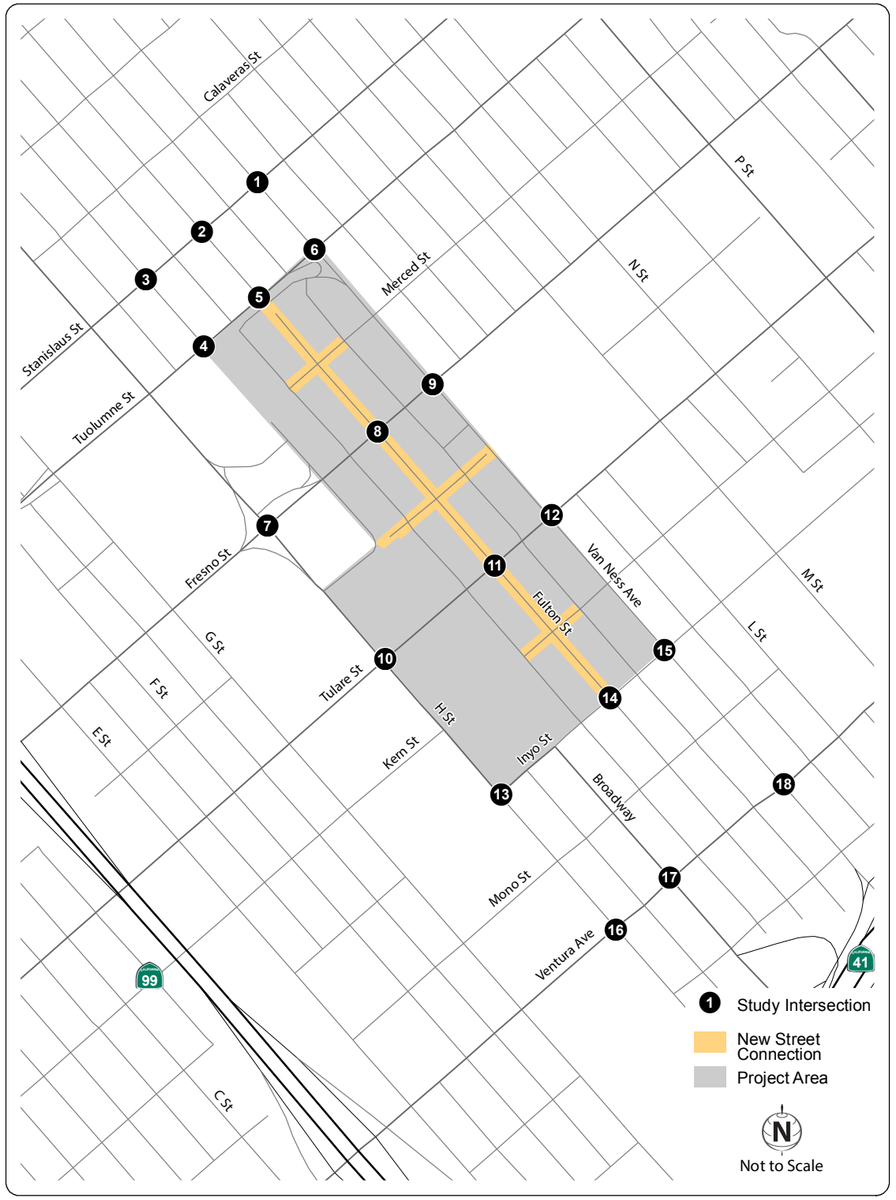
Similar to the Pedestrian Mall Alternative, the Open to Traffic Alternatives are expected to have a similar cumulative effect as the Baseline Plus Project scenario.

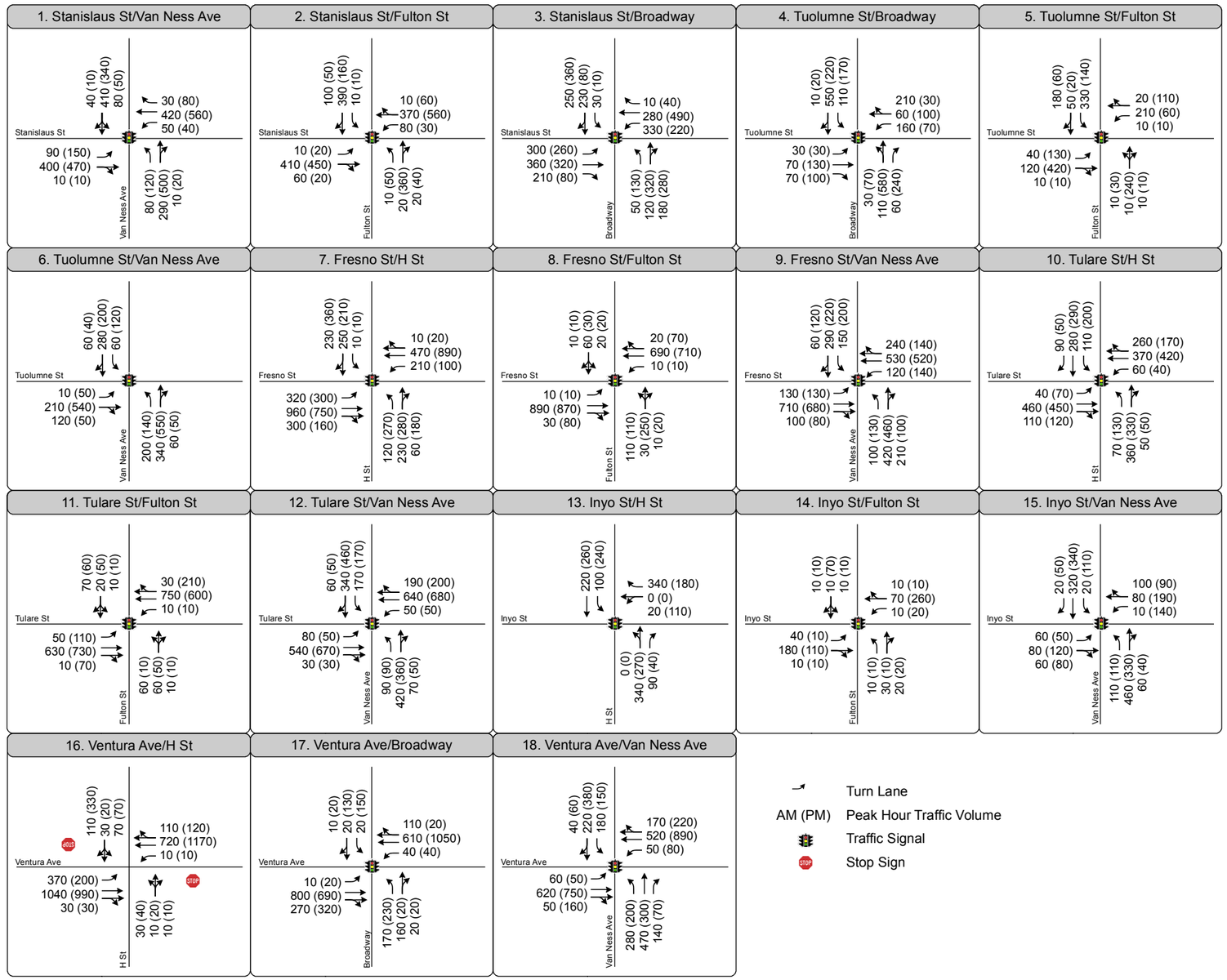
Overall, the Open to Traffic alternatives may cause some shifts in local traffic patterns by opening the Fulton Mall and its cross streets to vehicle traffic. However, since these alternatives would create narrow, two-way vehicular streets, these new roadways would primarily carry local trips to access adjacent businesses. Therefore, these changes in traffic patterns would be localized to roadways in the project study area.

The 2010 Fresno COG TDF model was used to forecast the shifts in traffic associated with the Open to Traffic alternatives under Cumulative conditions. To account for model error, this study adjusts project traffic forecasts using a process known as the "difference method," which adjusts raw model volume forecasts based on expected incremental growth from Baseline Conditions using the following formula:

Cumulative Plus Project Forecasts = Baseline Traffic Count +
(Cumulative Plus Project Raw Model Volume – Base Year Raw Model Volume)

Figure 10 shows the peak hour Cumulative Plus Project – Mall Open to Traffic forecasts at the study intersections.





FEHR PEERS

Path: \\Fpse03\fpse2\Data2\2010Projects\RS_Projects\RS10_2774.02\Graphics\GIS\MXD\fig10_phtv_CumulativePP.mxd

PEAK HOUR TRAFFIC VOLUMES AND LANE CONFIGURATIONS - CUMULATIVE PLUS PROJECT CONDITIONS - MALL OPEN TO TRAFFIC

FIGURE 10

Intersection Operations

For the Pedestrian Mall alternative, intersection operations would remain the same as the Baseline Conditions.

For the Mall Open to Traffic alternatives, **Table 10** summarizes the AM and PM peak hour LOS at the study intersections (refer to Appendix D for calculations). **Figure 11** also shows the peak hour intersection LOS for the Mall Open to Traffic alternatives. Based on the results in Table 9, the following four intersections would operate at LOS E or F during the AM and/or PM peak hour under Cumulative Plus Project Conditions with the Mall Open to Traffic alternatives:

- Stanislaus Street / Broadway
- Tuolumne Street / Broadway
- Fresno Street / H Street
- Ventura Avenue / H Street

All of these intersections are located within the Core Area, defined as the area bounded by State Routes 99, 41, and 180 in Fulton Corridor Specific Plan policy 9-3-1. Per the City of Fresno's General Plan policy MT-1-m, LOS E and F operations are acceptable at City of Fresno intersections within the Downtown Neighborhoods Community Plan area and the Fulton Corridor Specific Plan area. Therefore, all intersections are considered to operate at an acceptable level of service.

TABLE 10:
PEAK HOUR INTERSECTION OPERATIONS – CUMULATIVE PLUS PROJECT CONDITIONS

Intersection	Traffic Control	Cumulative No Project Conditions[1]				Cumulative + Project: Mall Open to Traffic			
		AM Peak Hr		PM Peak Hr		AM Peak Hr		PM Peak Hr	
		Delay[2]	LOS[3]	Delay[2]	LOS[3]	Delay[2]	LOS[3]	Delay[2]	LOS[3]
1. Stanislaus Street / Van Ness Avenue	Signal	28	C	53	D	29	C	52	D
2. Stanislaus Street / Fulton Street	Signal	18	B	16	B	18	B	17	B
3. Stanislaus Street / Broadway	Signal	50	D	>150	F	51	D	>150	F
4. Tuolumne Street / Broadway	Signal	46	D	>150	F	41	D	>150	F
5. Tuolumne Street / Fulton Street	Signal	22	C	19	B	23	C	34	C
6. Tuolumne Street / Van Ness Avenue	Signal	38	D	40	D	35	D	39	D
7. Fresno Street / H Street	Signal	84	F	102	F	77	E	92	F
8. Fresno Street / Fulton Street[4]	Pedestrian Signal					19	B	13	B
9. Fresno Street / Van Ness Avenue	Signal	49	D	62	E	48	D	48	D
10. Tulare Street / H Street	Signal	14	B	27	C	15	B	22	C
11. Tulare Street / Fulton Street[4]	Pedestrian Signal					14	B	15	B
12. Tulare Street / Van Ness Avenue	Signal	38	D	35	C	42	D	33	C
13. Inyo Street / H Street	Signal	12	B	23	C	20	B	14	B
14. Inyo Street / Fulton Street	Signal	11	B	9	A	9	A	10	B
15. Inyo Street / Van Ness Avenue	Signal	13	B	13	B	14	B	13	B
16. Ventura Avenue / H Street	Side Street Stop-Controlled	>150	F	>150	F	>150	F	>150	F
17. Ventura Avenue / Broadway	Signal	15	B	18	B	17	B	19	B
18. Ventura Avenue / Van Ness Avenue	Signal	29	C	32	C	29	C	31	C

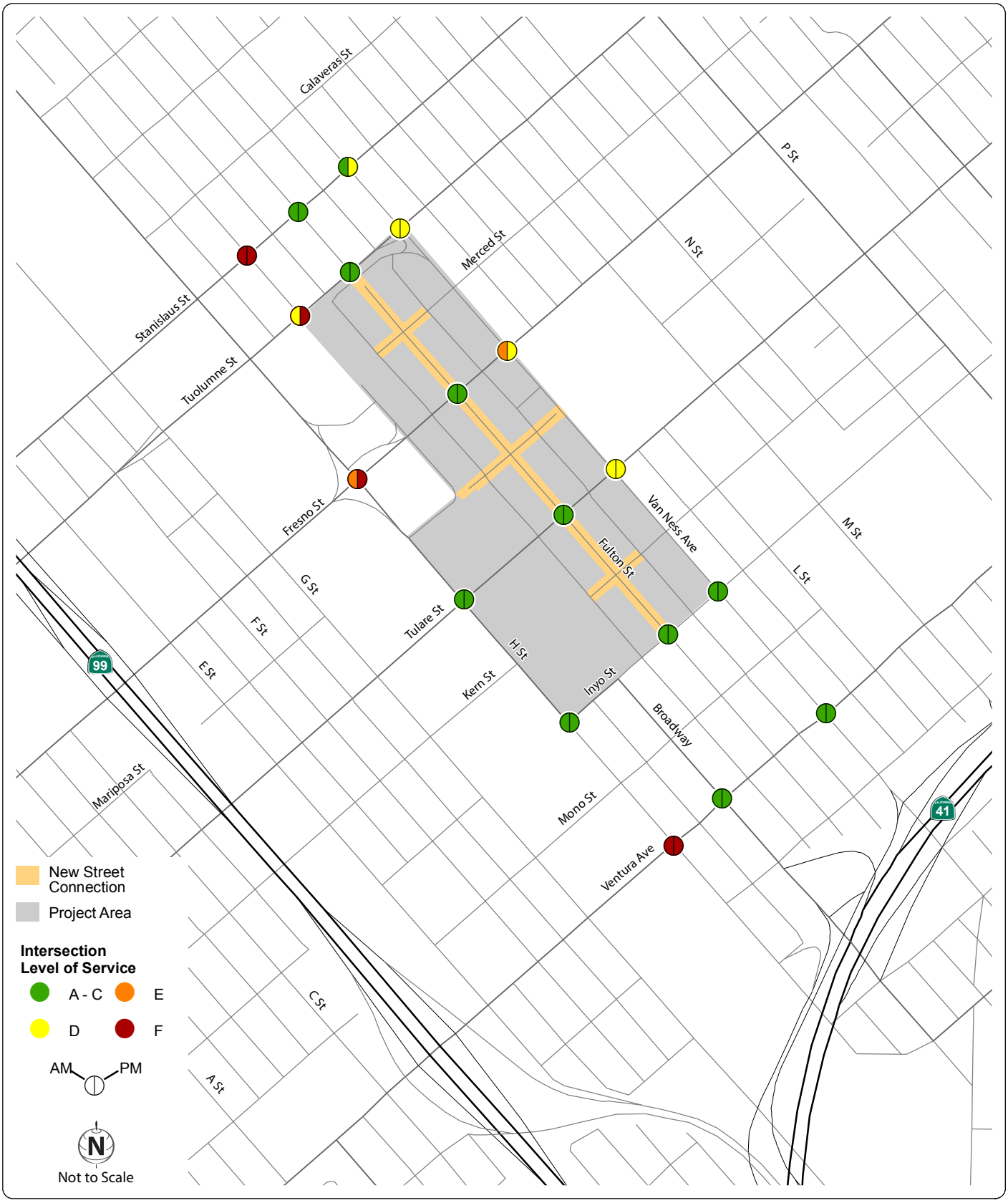
Notes: [1]Cumulative Plus Project: Pedestrian Mall alternative would have the same traffic operations as Cumulative No Project Conditions.

[2]For signalized intersections, the overall average intersection control delay is reported in seconds per vehicle. For side-street stop controlled intersections, the average control delay for the movement with the greatest delay is reported in seconds per vehicle.

[3]Level of Service based on *Highway Capacity Manual* (Transportation Research Board, 2000).

[4]Intersection would exist as a pedestrian signal as it does under Baseline Conditions and is not analyzed under Cumulative No Project Conditions. Intersection would become fully signalized under Cumulative Plus Project – Mall Open to Traffic conditions.

Source: Fehr & Peers, 2013.



FEHR PEERS

INTERSECTION LEVEL OF SERVICE - CUMULATIVE PLUS PROJECT CONDITIONS - MALL OPEN TO TRAFFIC

\\Fpse03\fpse2\Data2\2010Projects\RS_Projects\RS10_2774.02\Graphics\GIS\MXD\fig11_los_CumulativePP.mxd

FIGURE 11

Roadway Volumes

For the Pedestrian Mall alternative, roadway volumes would remain the same as the Cumulative No Project Conditions.

For the Mall Open to Traffic alternatives, **Table 11** presents the forecasted average daily traffic volumes for each study roadway segment. The daily traffic volumes are presented to provide a general evaluation on the expected change in daily traffic patterns with the mall open to traffic under Cumulative Conditions.

TABLE 11:
DAILY ROADWAY SEGMENT TRAFFIC VOLUMES –
CUMULATIVE PLUS PROJECT CONDITIONS

	Average Daily Traffic Volumes	
Roadway Segment	**Cumulative No Project Conditions[1]**	**Cumulative + Project: Mall Open to Traffic**
1. Broadway: North of Stanislaus St.	13,930	13,810
2. Fulton Street: North of Stanislaus St.	6,310	6,360
3. Van Ness Avenue: North of Stanislaus St.	11,300	11,710
4. Fulton Street: Tuolumne St. to Inyo St.[2]	N/A	2,310
5. Van Ness Avenue: Fresno St. to Tulare St.	14,280	13,950
6. Van Ness Avenue: Tulare St. to Inyo St.	13,750	13,950
7. Van Ness Avenue: Inyo St. to Ventura Ave.	13,530	13,640
8. Stanislaus Street: M Street to Van Ness Ave.	14,190	14,030
9. Stanislaus Street: Broadway to E Street	22,110	22,010
10. Tuolumne Street: E Street to Broadway	5,570	5,990
11. Tuolumne Street: Van Ness Ave. to M Street	5,290	5,210
12. Fresno Street: Broadway to Van Ness Ave.	18,420	18,480
13. Fresno Street: Van Ness Ave. to M Street	20,200	20,050
14. Tulare Street: H Street to Van Ness Ave.	18,780	18,980
15. Inyo Street: H Street to Van Ness Ave.	6,150	6,120
16. Ventura Avenue: Van Ness Ave. to M Street	24,880	24,570

Notes: [1]Cumulative Plus Project: Pedestrian Mall alternative would have the same traffic volumes as Cumulative No Project Conditions.
[2]Fulton Street is a pedestrian mall between Tuolumne St. and Inyo St. under Cumulative No Project Conditions and Cumulative Plus Project: Pedestrian Mall alternative.

Source: Fehr & Peers, 2013.

CHAPTER 5. IMPACTS AND MITIGATION MEASURES

This chapter summarizes the potentially significant project-specific and cumulative impacts of the proposed project on the transportation system. Each impact is followed by a recommended mitigation measure to reduce the significance of identified impacts.

PROJECT-SPECIFIC IMPACTS AND MITIGATION MEASURES

This section evaluates the significance of project impacts based on the thresholds of significance and analysis results presented in previous chapters.

Impact B-1: The proposed project could cause potentially significant impacts to traffic operations at study intersections.

Significance: Less Than Significant

The proposed project would not significantly change traffic volumes. For the Pedestrian Mall alternative, traffic volumes and intersection operations would remain the same as Baseline Conditions.

For the Mall Open to Traffic alternatives, minor shifts in traffic patterns are expected to occur as the result of opening Fulton Mall and its cross streets to vehicular traffic. However, the proposed streets under these alternatives would primarily carry local trips to access adjacent businesses and would not greatly affect traffic volumes or traffic operations.

Table 5 shows that all study intersections would operate at LOS D or better with the proposed project.

Therefore, this impact is **less than significant**.

Impact B-2: The proposed project could cause potentially significant impacts to traffic operations and bicycle and pedestrian circulation during construction.

Significance: Potentially Significant

Construction may include disruptions to the transportation network near the site, including the possibility of temporary closures. Heavy vehicles would access the site and may need to be staged for construction. These activities could result in degraded roadway operating conditions as well as cause impacts to bicycle and pedestrian facilities along the existing Fulton Mall.

Therefore, this impact is considered **potentially significant**.

Mitigation B-2:

Prior to the beginning of construction, a construction traffic management plan shall be prepared to address potential impacts to transportation facilities. The plan shall ensure that acceptable operating conditions are maintained on local roadways as well as detours or facilities for bicyclists, pedestrians,

and transit users. Implementation of this mitigation measure would reduce the above impact to **less than significant**.

Residual Significance: Less Than Significant

Impact B-3: The proposed project could cause potentially significant impacts to transit service.

Significance: Less Than Significant

The proposed project would not adversely affect existing or planned transit facilities. The proposed project would not conflict with adopted plans, policies, or programs regarding transit facilities. Therefore, this impact is considered **less than significant**.

Impact B-4: The proposed project could cause potentially significant impacts to bicycle and pedestrian facilities.

Significance: Less Than Significant

The Fulton Mall Reconstruction Project proposes either restoring the existing pedestrian mall or replacing the pedestrian mall with a new roadway. For the Pedestrian Mall alternative, the mall's existing use as a pedestrian and bicycle facility would remain. Therefore, there would be no impact to bicycle and pedestrian facilities except during construction activity (see Impact B-2).

For the Mall Open to Traffic alternatives, the Fulton Mall Reconstruction Project proposes wide pedestrian areas and a local-serving roadway carrying vehicle traffic at relatively low speeds. This would maintain the Mall as a bicycle and pedestrian friendly facility.

Since the proposed project would not adversely affect existing or planned bicycle or pedestrian networks this impact is considered **less than significant**.

Impact B-5: The proposed project could result in increased hazards due to design features.

Significance: Potentially Significant

For the Pedestrian Mall alternative, the mall would be improved to enhance accessibility and reduce hazards to pedestrians. Therefore, this impact would be less than significant under this alternative.

For the Mall Open to Traffic alternatives, vehicle traffic would be reintroduced into the corridor. Depending on the design of the roadway and the alternative selected, there is the potential for increased hazards from the interaction between travel modes (i.e., vehicles and pedestrians, vehicles and bicyclists, etc.) and the visibility (or lack thereof) of each at interaction points.

Therefore, this impact is considered **potentially significant**.

<u>Mitigation B-5:</u>

If one of the Mall Open to Traffic alternatives is selected, the project design shall consider issues such as design speed, sight distance, and bicycle and pedestrian treatments to enhance traveler safety.

Specifically, if Alternative B (Reconnect the Grid with Vignettes) is selected, the placement of art pieces in the project design shall consider drivers' ability to see pedestrians and cyclists at likely interaction points, such as intersections and mid-block crossings.

Implementation of this mitigation measure would reduce the above impact to **less than significant**.

Residual Significance: Less Than Significant

CUMULATIVE IMPACTS

This section identifies the incremental cumulative effects of the proposed Fulton Mall Reconstruction Project. Incremental cumulative effects that exceed the thresholds of significance based on the criteria presented in Chapter 1 are considered cumulatively considerable, and therefore a significant impact.

Impact C-1: The proposed project could contribute to traffic conditions that result in significant impacts to traffic operations at study intersections.

Significance: Less Than Significant

The proposed project is anticipated to potentially stimulate and support future development in the Project Area. However, the proposed project is not expected to greatly change traffic patterns in the Study Area.

For the Pedestrian Mall alternative, traffic volumes and intersection operations would remain the same as Cumulative No Project Conditions.

For the Mall Open to Traffic alternatives, minor shifts in traffic patterns are expected to occur as the result of opening Fulton Mall to vehicular traffic. However, the proposed streets under these alternatives would primarily carry local trips to access adjacent businesses and would not greatly affect traffic volumes or traffic operations.

Table 9 shows that the following four study intersections would operate at LOS E or F during the AM and/or PM peak hour under Cumulative Plus Project Conditions with the Mall Open to Traffic alternatives:

- Stanislaus Street / Broadway
- Tuolumne Street / Broadway
- Fresno Street / H Street
- Ventura Avenue / H Street

All of these intersections are located within the Core Area, defined as the area bounded by State Routes 99, 41, and 180 in Fulton Corridor Specific Plan policy 9-3-1. Per the City of Fresno's General Plan policy MT-1-m, LOS E and F operations are acceptable at City of Fresno intersections within the Downtown Neighborhoods Community Plan area and the Fulton Corridor Specific Plan area. Therefore, all intersections are considered to operate at an acceptable level of service.

Since these intersections all operate acceptably, this impact is **less than significant**.

APPENDIX A: REFERENCES

REFERENCES

City of Fresno. (2002). *2025 Fresno General Plan*.

City of Fresno. (2002). *Master Environmental Impact Report for the 2025 Fresno General Plan*. Prepared by: U.R.S. Corporation.

City of Fresno. (2007). *Fresno Major Street Impact Fee Program Nexus Study*. Prepared by: Economic & Planning Systems, Inc.

City of Fresno. (2008). *City-Wide Traffic Signal Mitigation Impact Fee Nexus Analysis for Proposed Fee Update*. Prepared by: City of Fresno, Public Works Department, Engineering Division.

City of Fresno. (2010). *Bicycle, Pedestrian, and Trails Master Plan*. Prepared by: Fehr & Peers.

City of Fresno. (2007). *Downtown Transportation and Infrastructure Study*. Prepared by: Wilbur Smith Associates, BMS Design Group, and Bay Area Economics.

City of Fresno. (2011). *Public Transportation (FAX)*. Retrieved from: http://www.fresno.gov/DiscoverFresno/PublicTransportation

City of Fresno Department of Public Works. (2009). *City of Fresno Traffic Impact Study Report Guidelines*.

City of Fresno – Fresno Area Express. (2002). *2001 Transit Long Range Master Plan*. Prepared by: Nelson\Nygaard Consulting Associates & TJKM Transportation Consultants.

City of Fresno – Fresno Area Express Planning Division. (2011). *Short Range Transit Plan*. Prepared by: Kimley-Horn and Associates, Inc.

Council of Fresno County Governments. (2008). *Bus Rapid Transit Master Plan*. Prepared by: Kimley-Horn and Associates, Inc.

Council of Fresno County Governments. (2008). *Fresno-Madera Metropolitan Freeway Interchange Deficiency Study Phase II*. Prepared by: Fehr & Peers.

Council of Fresno County Governments. (2009). *Fresno Regional Traffic Mitigation Fee Nexus Study Report*. Prepared by: Parsons Brinckerhoff.

Council of Fresno County Governments. (2010). *2011 Regional Transportation Plan*.

State of California Department of Transportation (Caltrans). (2002). *Guide for the Preparation of Traffic Impact Studies*.

Transportation Research Board. (2000). *Highway Capacity Manual*.

APPENDIX B:
TRAFFIC COUNT DATA

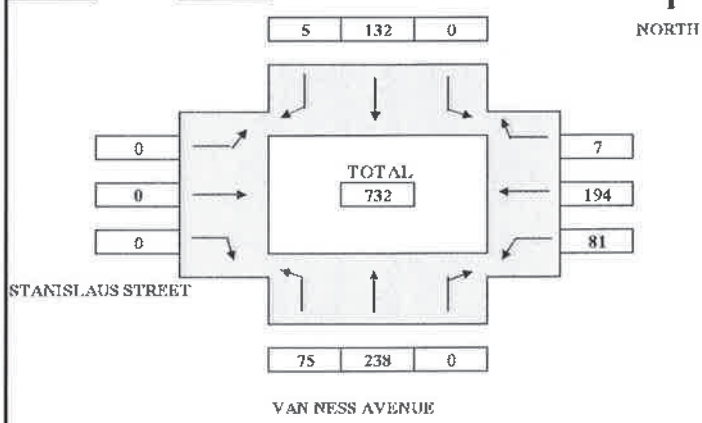
B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

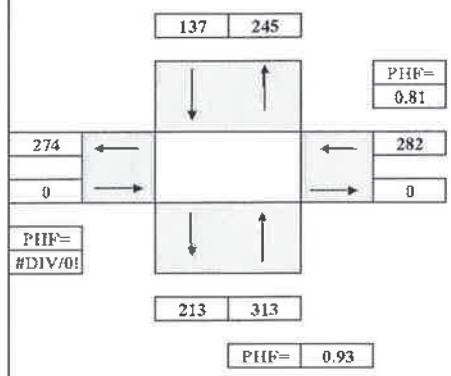
PROJECT:	HST PROJECT	SURVEY DATE:	11/3/2009	DAY:	TUESDAY
N-S APPROACH:	VAN NESS AVENUE	SURVEY TIME:	7:00 AM	TO	9:00 AM
E-W APPROACH:	STANISLAUS STREET	CITY:	FRESNO	FILE:	2911072-13AM

PEAK HOUR

07:45 AM TO 08:45 AM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD From	To	NORTHBOUND Left	Thru	Right	SOUTHBOUND Left	Thru	Right	EASTBOUND Left	Thru	Right	WESTBOUND Left	Thru	Right	TOTAL
SURVEY DATA														
7:00 AM ---	7:15 AM	11	23	0	0	10	0	0	0	0	1	34	1	*80*
7:15 AM ---	7:30 AM	28	53	0	0	31	2	0	0	0	9	68	4	*195*
7:30 AM ---	7:45 AM	45	109	0	0	50	2	0	0	0	25	118	5	*354*
7:45 AM ---	8:00 AM	61	177	0	0	89	3	0	0	0	47	179	9	*565*
8:00 AM ---	8:15 AM	85	222	0	0	118	4	0	0	0	73	224	11	*737*
8:15 AM ---	8:30 AM	101	285	0	0	145	5	0	0	0	89	275	12	*912*
8:30 AM ---	8:45 AM	120	347	0	0	182	7	0	0	0	106	312	12	*1,086*
8:45 AM ---	9:00 AM	144	391	0	0	207	7	0	0	0	114	352	14	*1,229*
TOTAL BY PERIOD														
7:00 AM ---	7:15 AM	11	23	0	0	10	0	0	0	0	1	34	1	*80*
7:15 AM ---	7:30 AM	17	30	0	0	21	2	0	0	0	8	34	3	*115*
7:30 AM ---	7:45 AM	17	56	0	0	19	0	0	0	0	16	50	1	*159*
7:45 AM ---	8:00 AM	16	68	0	0	39	1	0	0	0	22	61	4	*211*
8:00 AM ---	8:15 AM	24	45	0	0	29	1	0	0	0	26	45	2	*172*
8:15 AM ---	8:30 AM	16	63	0	0	27	1	0	0	0	16	51	1	*175*
8:30 AM ---	8:45 AM	19	62	0	0	37	2	0	0	0	17	37	0	*174*
8:45 AM ---	9:00 AM	24	44	0	0	25	0	0	0	0	8	40	2	*143*
HOURLY TOTALS														
7:00 AM ---	8:00 AM	61	177	0	0	89	3	0	0	0	47	179	9	*565*
7:15 AM ---	8:15 AM	74	199	0	0	108	4	0	0	0	72	190	10	*657*
7:30 AM ---	8:30 AM	73	232	0	0	114	3	0	0	0	80	207	8	*717*
7:45 AM ---	8:45 AM	75	238	0	0	132	5	0	0	0	81	194	7	*732*
8:00 AM ---	9:00 AM	83	214	0	0	118	4	0	0	0	67	173	5	*664*

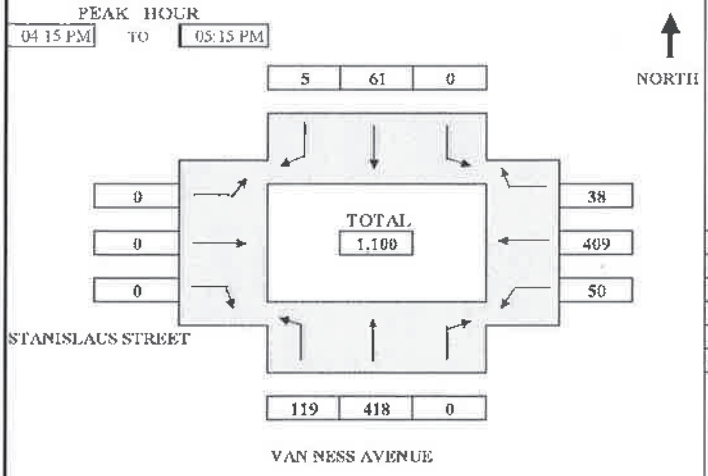
Telephone: (510)232-1271 Fax: (510)232-1272

B.A.Y.M.E.T.R.I.C.S.

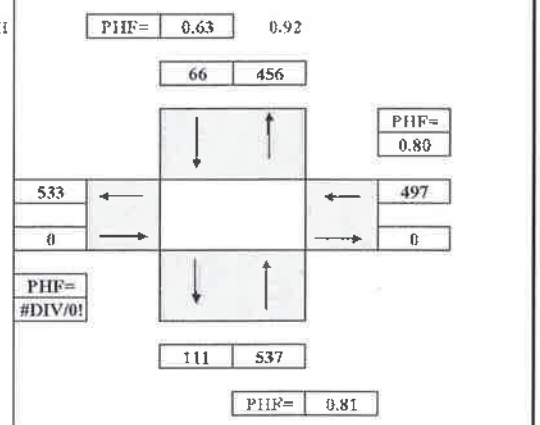
INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT:	HST PROJECT	SURVEY DATE:	11/3/2009	DAY:	TUESDAY
N-S APPROACH:	VAN NESS AVENUE	SURVEY TIME:	4:00 PM	TO	6:00 PM
E-W APPROACH:	STANISLAUS STREET	CITY:	FRESNO	FILE:	2911072-13PM

PEAK HOUR
04:15 PM TO 05:15 PM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD From		To	NORTHBOUND Left	Thru	Right	SOUTHBOUND Left	Thru	Right	EASTBOUND Left	Thru	Right	WESTBOUND Left	Thru	Right	TOTAL
SURVEY DATA															
4:00 PM	---	4:15 PM	35	103	0	0	23	3	0	0	0	10	80	12	*266*
4:15 PM	---	4:30 PM	53	195	0	0	38	3	0	0	0	27	156	20	*492*
4:30 PM	---	4:45 PM	74	302	0	0	54	5	0	0	0	39	253	29	*756*
4:45 PM	---	5:00 PM	115	395	0	0	69	7	0	0	0	55	350	38	*1,029*
5:00 PM	---	5:15 PM	154	521	0	0	84	8	0	0	0	60	489	50	*1,366*
5:15 PM	---	5:30 PM	178	608	0	0	97	12	0	0	0	69	573	54	*1,591*
5:30 PM	---	5:45 PM	204	711	0	0	110	14	0	0	0	77	644	68	*1,828*
5:45 PM	---	6:00 PM	222	759	0	0	123	15	0	0	0	80	698	74	*1,971*
TOTAL BY PERIOD															
4:00 PM	---	4:15 PM	35	103	0	0	23	3	0	0	0	10	80	12	*266*
4:15 PM	---	4:30 PM	18	92	0	0	15	0	0	0	0	17	76	8	*226*
4:30 PM	---	4:45 PM	21	107	0	0	16	2	0	0	0	12	97	9	*264*
4:45 PM	---	5:00 PM	41	93	0	0	15	2	0	0	0	16	97	9	*273*
5:00 PM	---	5:15 PM	39	126	0	0	15	1	0	0	0	5	139	12	*337*
5:15 PM	---	5:30 PM	24	87	0	0	13	4	0	0	0	9	84	4	*225*
5:30 PM	---	5:45 PM	26	103	0	0	13	2	0	0	0	8	71	14	*237*
5:45 PM	---	6:00 PM	18	48	0	0	13	1	0	0	0	3	54	6	*143*
HOURLY TOTALS															
4:00 PM	---	5:00 PM	115	395	0	0	69	7	0	0	0	55	350	38	*1,029*
4:15 PM	---	5:15 PM	119	418	0	0	61	5	0	0	0	50	409	38	*1,100*
4:30 PM	---	5:30 PM	125	413	0	0	59	9	0	0	0	42	417	34	*1,099*
4:45 PM	---	5:45 PM	130	409	0	0	56	9	0	0	0	38	391	39	*1,072*
5:00 PM	---	6:00 PM	107	364	0	0	54	8	0	0	0	25	348	36	*942*

Telephone: (510)232-1271 Fax: (510)232-1272

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

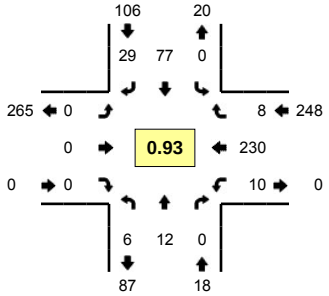
LOCATION: Fulton St -- Stanislaus St

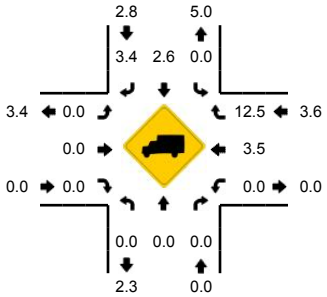
CITY/STATE: Fresno, CA

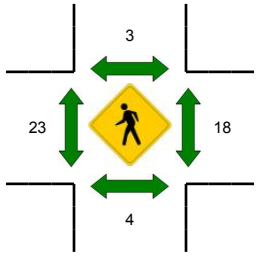
QC JOB #: 10705101

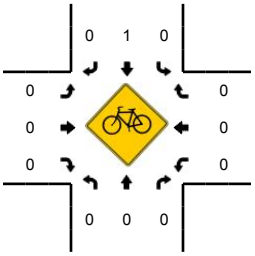
DATE: Thu, Jan 26 2012

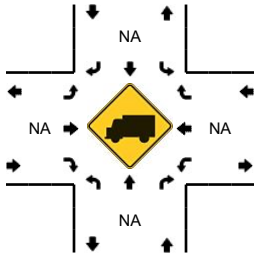
Peak-Hour: 7:55 AM -- 8:55 AM
Peak 15-Min: 8:00 AM -- 8:15 AM

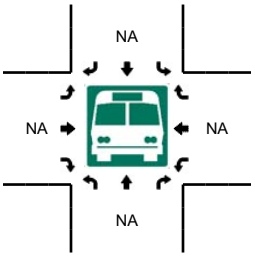












5-Min Count Period Beginning At	Fulton St (Northbound)				Fulton St (Southbound)				Stanislaus St (Eastbound)				Stanislaus St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	0	3	1	0	0	0	0	0	0	6	0	0	10	
7:05 AM	0	0	0	0	0	3	0	0	0	0	0	0	0	3	0	0	6	
7:10 AM	0	0	0	0	0	2	3	0	0	0	0	0	0	13	0	0	18	
7:15 AM	0	1	0	0	0	1	5	0	0	0	0	0	0	11	0	0	18	
7:20 AM	0	0	0	0	0	3	1	0	0	0	0	0	0	17	0	0	21	
7:25 AM	2	0	0	0	0	8	5	0	0	0	0	0	0	24	0	0	39	
7:30 AM	1	0	0	0	0	2	3	0	0	0	0	0	0	15	1	0	22	
7:35 AM	1	0	0	0	0	1	2	0	0	0	0	0	0	14	0	0	18	
7:40 AM	0	2	0	0	0	4	2	0	0	0	0	0	0	21	2	0	31	
7:45 AM	0	0	0	0	0	5	3	0	0	0	0	0	0	18	0	0	26	
7:50 AM	0	1	0	0	0	5	2	0	0	0	0	0	0	19	0	0	27	
7:55 AM	1	0	0	0	0	7	2	0	0	0	0	0	1	22	0	0	33	269
8:00 AM	0	2	0	0	0	7	4	0	0	0	0	0	0	19	0	0	32	291
8:05 AM	0	3	0	0	0	10	2	0	0	0	0	0	0	15	0	0	30	315
8:10 AM	1	1	0	0	0	3	5	0	0	0	0	0	3	24	1	0	38	335
8:15 AM	0	1	0	0	0	8	3	0	0	0	0	0	1	17	2	0	32	349
8:20 AM	2	0	0	0	0	5	2	0	0	0	0	0	1	18	1	0	29	357
8:25 AM	1	1	0	0	0	9	1	0	0	0	0	0	0	22	0	0	34	352
8:30 AM	0	1	0	0	0	4	0	0	0	0	0	0	0	21	0	0	26	356
8:35 AM	0	0	0	0	0	4	3	0	0	0	0	0	1	20	1	0	29	367
8:40 AM	1	1	0	0	0	11	2	0	0	0	0	0	0	14	1	0	30	366
8:45 AM	0	1	0	0	0	1	2	0	0	0	0	0	1	22	1	0	28	368
8:50 AM	0	1	0	0	0	8	3	0	0	0	0	0	2	16	1	0	31	372
8:55 AM	1	2	0	0	0	8	0	0	0	0	0	0	0	18	2	0	31	370

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	4	24	0	0	0	80	44	0	0	0	0	0	12	232	4	0	400
Heavy Trucks	0	0	0		0	4	0		0	0	0		0	4	0		8
Pedestrians		8				8				16				4			36
Bicycles	0	0	0		0	1	0		0	0	0		0	0	0		1
Railroad																	
Stopped Buses																	

Comments:

Report generated on 1/30/2012 5:49 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

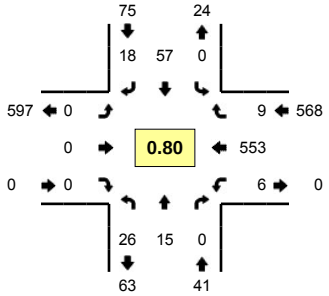
LOCATION: Fulton St -- Stanislaus St

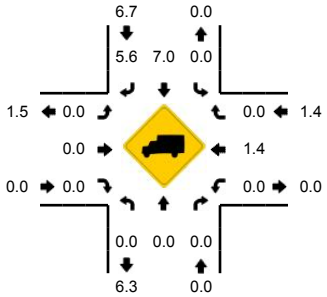
CITY/STATE: Fresno, CA

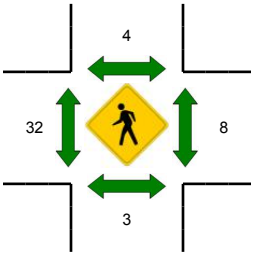
QC JOB #: 10705102

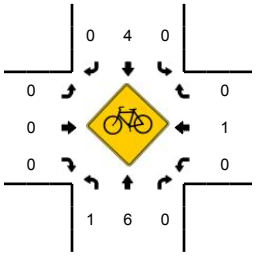
DATE: Thu, Jan 26 2012

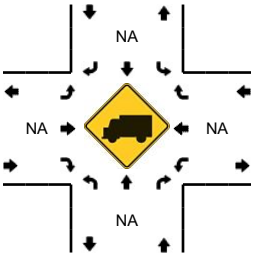
Peak-Hour: 4:35 PM -- 5:35 PM
Peak 15-Min: 5:00 PM -- 5:15 PM

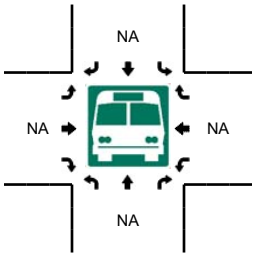












5-Min Count Period Beginning At	Fulton St (Northbound)				Fulton St (Southbound)				Stanislaus St (Eastbound)				Stanislaus St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	2	0	0	0	7	2	0	0	0	0	0	0	38	0	0	49	
4:05 PM	1	0	0	0	0	4	3	0	0	0	0	0	0	30	1	0	39	
4:10 PM	0	2	0	0	0	3	0	0	0	0	0	0	1	36	1	0	43	
4:15 PM	1	0	0	0	0	3	3	0	0	0	0	0	2	39	0	0	48	
4:20 PM	1	0	0	0	0	4	3	0	0	0	0	0	0	41	0	0	49	
4:25 PM	0	0	0	0	0	2	0	0	0	0	0	0	1	29	0	0	32	
4:30 PM	0	0	0	0	0	5	1	0	0	0	0	0	0	33	1	0	40	
4:35 PM	0	3	0	0	0	8	2	0	0	0	0	0	1	49	0	0	63	
4:40 PM	1	0	0	0	0	7	0	0	0	0	0	0	0	64	3	0	75	
4:45 PM	0	0	0	0	0	3	2	0	0	0	0	0	0	49	1	0	55	
4:50 PM	1	1	0	0	0	7	2	0	0	0	0	0	2	41	0	0	54	
4:55 PM	2	0	0	0	0	6	1	0	0	0	0	0	0	36	0	0	45	592
5:00 PM	8	2	0	0	0	9	2	0	0	0	0	0	0	51	0	0	72	615
5:05 PM	6	2	0	0	0	2	1	0	0	0	0	0	2	55	1	0	69	645
5:10 PM	6	6	0	0	0	2	1	0	0	0	0	0	0	55	2	0	72	674
5:15 PM	1	1	0	0	0	1	1	0	0	0	0	0	1	45	1	0	51	677
5:20 PM	1	0	0	0	0	5	1	0	0	0	0	0	0	40	0	0	47	675
5:25 PM	0	0	0	0	0	3	0	0	0	0	0	0	0	35	0	0	38	681
5:30 PM	0	0	0	0	0	4	5	0	0	0	0	0	0	33	1	0	43	684
5:35 PM	4	0	0	0	0	4	3	0	0	0	0	0	0	36	1	0	48	669
5:40 PM	1	2	0	0	0	1	1	0	0	0	0	0	1	33	2	0	41	635
5:45 PM	0	2	0	0	0	4	2	0	0	0	0	0	0	24	0	0	32	612
5:50 PM	0	2	0	0	0	1	1	0	0	0	0	0	0	15	2	0	21	579
5:55 PM	1	0	0	0	0	7	1	0	0	0	0	0	0	13	0	0	22	556

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	80	40	0	0	0	52	16	0	0	0	0	0	8	644	12	0	852
Heavy Trucks	0	0	0		0	4	0		0	0	0		0	8	0		12
Pedestrians		4				0				28				8			40
Bicycles	0	5	0		0	0	0		0	0	0		0	0	0		5
Railroad																	
Stopped Buses																	

Comments:

Report generated on 1/30/2012 5:49 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

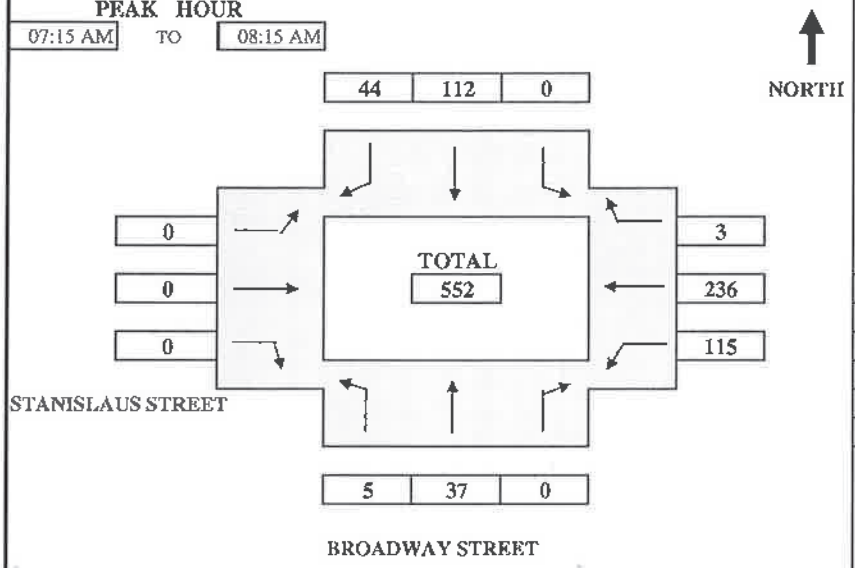
B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

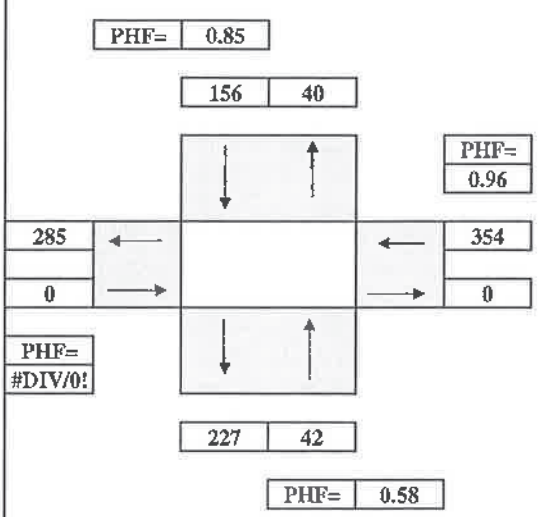
PROJECT:	HST PROJECT	SURVEY DATE:	11/3/2009	DAY:	TUESDAY
N-S APPROACH:	BROADWAY STREET	SURVEY TIME:	7:00 AM	TO	9:00 AM
E-W APPROACH:	STANISLAUS STREET	CITY:	FRESNO	FILE:	2911072-2AM

PEAK HOUR

07:15 AM TO 08:15 AM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD From		To	NORTHBOUND Left	Thru	Right	SOUTHBOUND Left	Thru	Right	EASTBOUND Left	Thru	Right	WESTBOUND Left	Thru	Right	TOTAL
SURVEY DATA															
7:00 AM	---	7:15 AM	1	7	0	0	19	10	0	0	0	11	42	0	*90*
7:15 AM	---	7:30 AM	1	14	0	0	50	22	0	0	0	53	91	1	*232*
7:30 AM	---	7:45 AM	1	21	0	0	74	31	0	0	0	78	153	2	*360*
7:45 AM	---	8:00 AM	5	35	0	0	98	41	0	0	0	106	216	2	*503*
8:00 AM	---	8:15 AM	6	44	0	0	131	54	0	0	0	126	278	3	*642*
8:15 AM	---	8:30 AM	6	53	0	0	150	72	0	0	0	144	343	7	*775*
8:30 AM	---	8:45 AM	6	62	0	0	168	85	0	0	0	155	401	11	*888*
8:45 AM	---	9:00 AM	7	67	0	0	185	93	0	0	0	159	466	14	*991*
TOTAL BY PERIOD															
7:00 AM	---	7:15 AM	1	7	0	0	19	10	0	0	0	11	42	0	*90*
7:15 AM	---	7:30 AM	0	7	0	0	31	12	0	0	0	42	49	1	*142*
7:30 AM	---	7:45 AM	0	7	0	0	24	9	0	0	0	25	62	1	*128*
7:45 AM	---	8:00 AM	4	14	0	0	24	10	0	0	0	28	63	0	*143*
8:00 AM	---	8:15 AM	1	9	0	0	33	13	0	0	0	20	62	1	*139*
8:15 AM	---	8:30 AM	0	9	0	0	19	18	0	0	0	18	65	4	*133*
8:30 AM	---	8:45 AM	0	9	0	0	18	13	0	0	0	11	58	4	*113*
8:45 AM	---	9:00 AM	1	5	0	0	17	8	0	0	0	4	65	3	*103*
HOURLY TOTALS															
7:00 AM	---	8:00 AM	5	35	0	0	98	41	0	0	0	106	216	2	*503*
7:15 AM	---	8:15 AM	5	37	0	0	112	44	0	0	0	115	236	3	*552*
7:30 AM	---	8:30 AM	5	39	0	0	100	50	0	0	0	91	252	6	*543*
7:45 AM	---	8:45 AM	5	41	0	0	94	54	0	0	0	77	248	9	*528*
8:00 AM	---	9:00 AM	2	32	0	0	87	52	0	0	0	53	250	12	*488*

Telephone: (510)232-1271 Fax: (510)232-1272

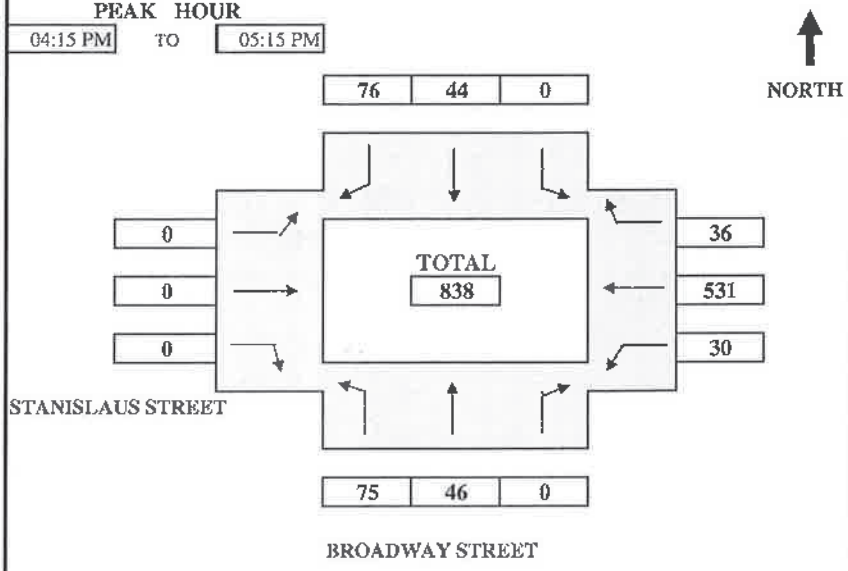
B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

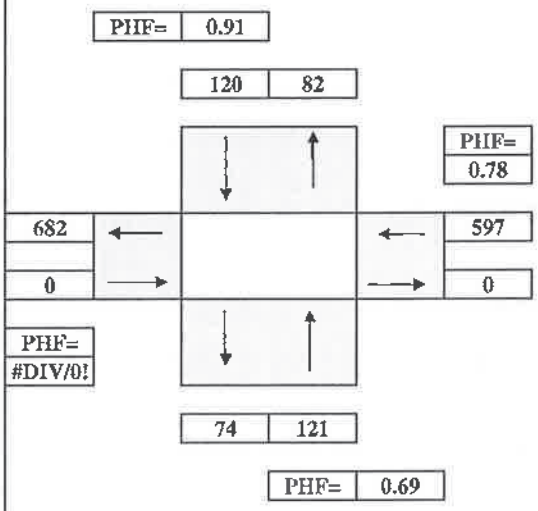
PROJECT:	HST PROJECT	SURVEY DATE:	11/3/2009	DAY:	TUESDAY
N-S APPROACH:	BROADWAY STREET	SURVEY TIME:	4:00 PM	TO	6:00 PM
E-W APPROACH:	STANISLAUS STREET	CITY:	FRESNO	FILE:	2911072-2PM

PEAK HOUR

04:15 PM TO 05:15 PM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD From		To	NORTHBOUND Left	Thru	Right	SOUTHBOUND Left	Thru	Right	EASTBOUND Left	Thru	Right	WESTBOUND Left	Thru	Right	TOTAL
SURVEY DATA															
4:00 PM	---	4:15 PM	24	10	0	0	10	11	0	0	0	12	97	5	*169*
4:15 PM	---	4:30 PM	43	22	0	0	22	26	0	0	0	26	190	14	*343*
4:30 PM	---	4:45 PM	59	30	0	0	33	48	0	0	0	33	315	21	*539*
4:45 PM	---	5:00 PM	71	40	0	0	46	67	0	0	0	38	452	29	*743*
5:00 PM	---	5:15 PM	99	56	0	0	54	87	0	0	0	42	628	41	*1,007*
5:15 PM	---	5:30 PM	109	69	0	0	57	101	0	0	0	42	750	49	*1,177*
5:30 PM	---	5:45 PM	119	76	0	0	61	109	0	0	0	42	841	51	*1,299*
5:45 PM	---	6:00 PM	123	82	0	0	64	117	0	0	0	43	922	53	*1,404*
TOTAL BY PERIOD															
4:00 PM	---	4:15 PM	24	10	0	0	10	11	0	0	0	12	97	5	*169*
4:15 PM	---	4:30 PM	19	12	0	0	12	15	0	0	0	14	93	9	*174*
4:30 PM	---	4:45 PM	16	8	0	0	11	22	0	0	0	7	125	7	*196*
4:45 PM	---	5:00 PM	12	10	0	0	13	19	0	0	0	5	137	8	*204*
5:00 PM	---	5:15 PM	28	16	0	0	8	20	0	0	0	4	176	12	*264*
5:15 PM	---	5:30 PM	10	13	0	0	3	14	0	0	0	0	122	8	*170*
5:30 PM	---	5:45 PM	10	7	0	0	4	8	0	0	0	0	91	2	*122*
5:45 PM	---	6:00 PM	4	6	0	0	3	8	0	0	0	1	81	2	*105*
HOURLY TOTALS															
4:00 PM	---	5:00 PM	71	40	0	0	46	67	0	0	0	38	452	29	*743*
4:15 PM	---	5:15 PM	75	46	0	0	44	76	0	0	0	30	531	36	*838*
4:30 PM	---	5:30 PM	66	47	0	0	35	75	0	0	0	16	560	35	*834*
4:45 PM	---	5:45 PM	60	46	0	0	28	61	0	0	0	9	526	30	*760*
5:00 PM	---	6:00 PM	52	42	0	0	18	50	0	0	0	5	470	24	*661*

Telephone: (510)232-1271 Fax: (510)232-1272

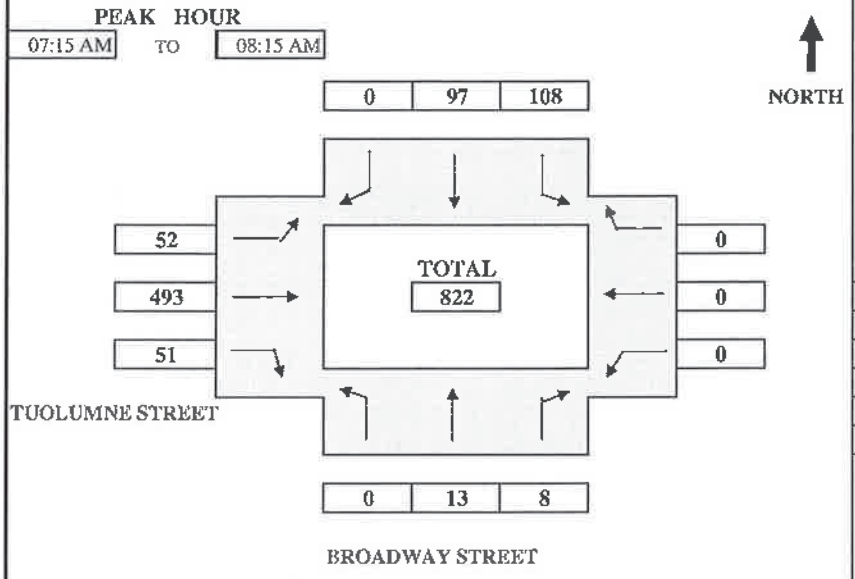
B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

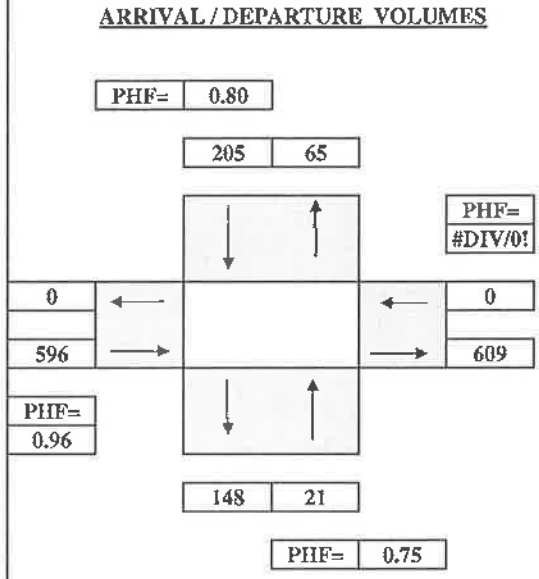
PROJECT:	HST PROJECT	SURVEY DATE:	11/3/2009	DAY:	TUESDAY
N-S APPROACH:	BROADWAY STREET	SURVEY TIME:	7:00 AM	TO	9:00 AM
E-W APPROACH:	TUOLUMNE STREET	CITY:	FRESNO	FILE:	2911072-3AM

PEAK HOUR

07:15 AM TO 08:15 AM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD From		To	NORTHBOUND Left	Thru	Right	SOUTHBOUND Left	Thru	Right	EASTBOUND Left	Thru	Right	WESTBOUND Left	Thru	Right	TOTAL
SURVEY DATA															
7:00 AM	---	7:15 AM	0	2	1	13	16	0	14	56	11	0	0	0	*113*
7:15 AM	---	7:30 AM	0	5	2	48	45	0	25	170	36	0	0	0	*331*
7:30 AM	---	7:45 AM	0	8	5	79	62	0	42	290	45	0	0	0	*531*
7:45 AM	---	8:00 AM	0	13	7	98	88	0	55	422	55	0	0	0	*738*
8:00 AM	---	8:15 AM	0	15	9	121	113	0	66	549	62	0	0	0	*935*
8:15 AM	---	8:30 AM	0	19	11	141	127	0	72	645	71	0	0	0	*1,086*
8:30 AM	---	8:45 AM	0	21	12	160	137	0	84	746	75	0	0	0	*1,235*
8:45 AM	---	9:00 AM	0	24	13	174	144	0	89	854	76	0	0	0	*1,374*
TOTAL BY PERIOD															
7:00 AM	---	7:15 AM	0	2	1	13	16	0	14	56	11	0	0	0	*113*
7:15 AM	---	7:30 AM	0	3	1	35	29	0	11	114	25	0	0	0	*218*
7:30 AM	---	7:45 AM	0	3	3	31	17	0	17	120	9	0	0	0	*200*
7:45 AM	---	8:00 AM	0	5	2	19	26	0	13	132	10	0	0	0	*207*
8:00 AM	---	8:15 AM	0	2	2	23	25	0	11	127	7	0	0	0	*197*
8:15 AM	---	8:30 AM	0	4	2	20	14	0	6	96	9	0	0	0	*151*
8:30 AM	---	8:45 AM	0	2	1	19	10	0	12	101	4	0	0	0	*149*
8:45 AM	---	9:00 AM	0	3	1	14	7	0	5	108	1	0	0	0	*139*
HOURLY TOTALS															
7:00 AM	---	8:00 AM	0	13	7	98	88	0	55	422	55	0	0	0	*738*
7:15 AM	---	8:15 AM	0	13	8	108	97	0	52	493	51	0	0	0	*822*
7:30 AM	---	8:30 AM	0	14	9	93	82	0	47	475	35	0	0	0	*755*
7:45 AM	---	8:45 AM	0	13	7	81	75	0	42	456	30	0	0	0	*704*
8:00 AM	---	9:00 AM	0	11	6	76	56	0	34	432	21	0	0	0	*636*

Telephone: (510)232-1271 Fax: (510)232-1272

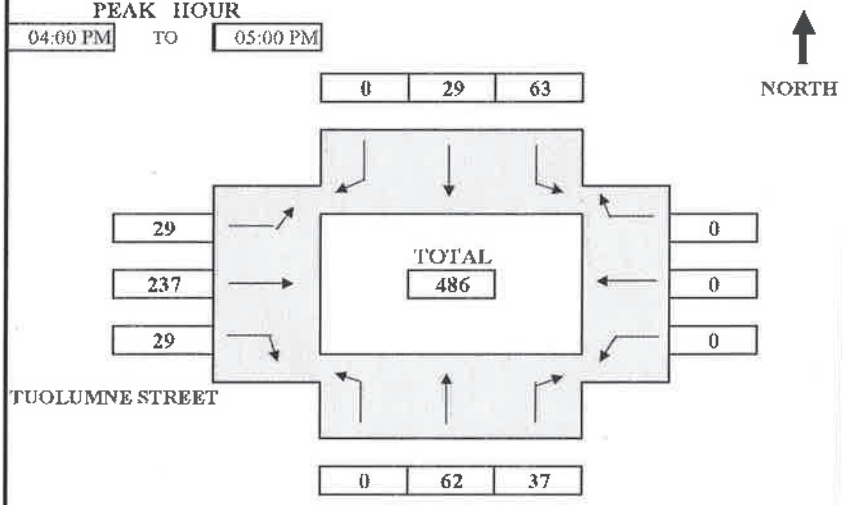
B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

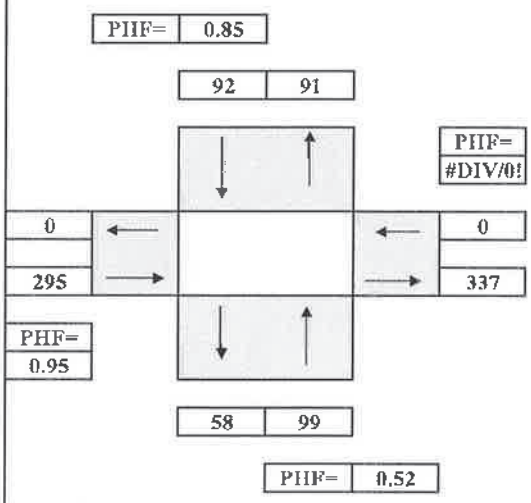
PROJECT:	HST PROJECT	SURVEY DATE:	11/3/2009	DAY:	TUESDAY
N-S APPROACH:	BROADWAY STREET	SURVEY TIME:	4:00 PM	TO	6:00 PM
E-W APPROACH:	TUOLUMNE STREET	CITY:	FRESNO	FILE:	2911072-3PM

PEAK HOUR

04:00 PM TO 05:00 PM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD From		To	NORTHBOUND Left	Thru	Right	SOUTHBOUND Left	Thru	Right	EASTBOUND Left	Thru	Right	WESTBOUND Left	Thru	Right	TOTAL
SURVEY DATA															
4:00 PM	---	4:15 PM	0	27	21	17	10	0	8	60	9	0	0	0	*152*
4:15 PM	---	4:30 PM	0	39	28	33	21	0	20	112	23	0	0	0	*276*
4:30 PM	---	4:45 PM	0	51	34	45	28	0	25	170	27	0	0	0	*380*
4:45 PM	---	5:00 PM	0	62	37	63	29	0	29	237	29	0	0	0	*486*
5:00 PM	---	5:15 PM	0	79	45	81	29	0	38	309	30	0	0	0	*611*
5:15 PM	---	5:30 PM	0	85	49	87	29	0	45	377	31	0	0	0	*703*
5:30 PM	---	5:45 PM	0	92	52	90	30	0	52	426	31	0	0	0	*773*
5:45 PM	---	6:00 PM	0	97	56	92	32	0	57	461	31	0	0	0	*826*
TOTAL BY PERIOD															
4:00 PM	---	4:15 PM	0	27	21	17	10	0	8	60	9	0	0	0	*152*
4:15 PM	---	4:30 PM	0	12	7	16	11	0	12	52	14	0	0	0	*124*
4:30 PM	---	4:45 PM	0	12	6	12	7	0	5	58	4	0	0	0	*104*
4:45 PM	---	5:00 PM	0	11	3	18	1	0	4	67	2	0	0	0	*106*
5:00 PM	---	5:15 PM	0	17	8	18	0	0	9	72	1	0	0	0	*125*
5:15 PM	---	5:30 PM	0	6	4	6	0	0	7	68	1	0	0	0	*92*
5:30 PM	---	5:45 PM	0	7	3	3	1	0	7	49	0	0	0	0	*70*
5:45 PM	---	6:00 PM	0	5	4	2	2	0	5	35	0	0	0	0	*53*
HOURLY TOTALS															
4:00 PM	---	5:00 PM	0	62	37	63	29	0	29	237	29	0	0	0	*486*
4:15 PM	---	5:15 PM	0	52	24	64	19	0	30	249	21	0	0	0	*459*
4:30 PM	---	5:30 PM	0	46	21	54	8	0	25	265	8	0	0	0	*427*
4:45 PM	---	5:45 PM	0	41	18	45	2	0	27	256	4	0	0	0	*393*
5:00 PM	---	6:00 PM	0	35	19	29	3	0	28	224	2	0	0	0	*340*

Telephone: (510)232-1271 Fax: (510)232-1272

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

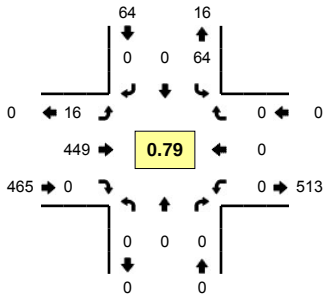
LOCATION: Fulton St -- Tuolumne St

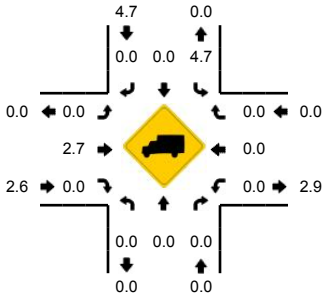
CITY/STATE: Fresno, CA

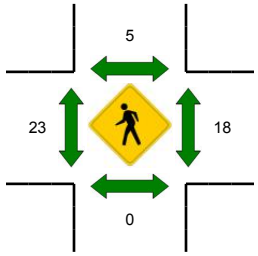
QC JOB #: 10705103

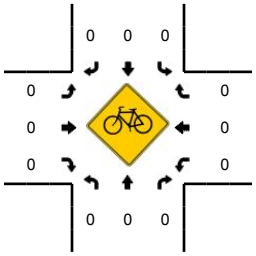
DATE: Thu, Jan 26 2012

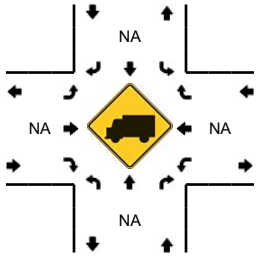
Peak-Hour: 7:30 AM -- 8:30 AM
Peak 15-Min: 7:50 AM -- 8:05 AM

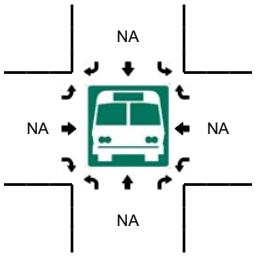












5-Min Count Period Beginning At	Fulton St (Northbound)				Fulton St (Southbound)				Tuolumne St (Eastbound)				Tuolumne St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	2	0	0	0	0	26	0	0	0	0	0	0	28	
7:05 AM	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	20	
7:10 AM	0	0	0	0	2	0	0	0	0	16	0	0	0	0	0	0	18	
7:15 AM	0	0	0	0	0	0	0	0	2	15	0	0	0	0	0	0	17	
7:20 AM	0	0	0	0	3	0	0	0	0	24	0	0	0	0	0	0	27	
7:25 AM	0	0	0	0	5	0	0	0	2	25	0	0	0	0	0	0	32	
7:30 AM	0	0	0	0	3	0	0	0	1	36	0	0	0	0	0	0	40	
7:35 AM	0	0	0	0	3	0	0	0	1	24	0	0	0	0	0	0	28	
7:40 AM	0	0	0	0	2	0	0	0	2	42	0	0	0	0	0	0	46	
7:45 AM	0	0	0	0	7	0	0	0	0	38	0	0	0	0	0	0	45	
7:50 AM	0	0	0	0	4	0	0	0	1	57	0	0	0	0	0	0	62	
7:55 AM	0	0	0	0	6	0	0	0	1	42	0	0	0	0	0	0	49	412
8:00 AM	0	0	0	0	6	0	0	0	2	48	0	0	0	0	0	0	56	440
8:05 AM	0	0	0	0	8	0	0	0	4	47	0	0	0	0	0	0	59	479
8:10 AM	0	0	0	0	6	0	0	0	1	26	0	0	0	0	0	0	33	494
8:15 AM	0	0	0	0	7	0	0	0	0	27	0	0	0	0	0	0	34	511
8:20 AM	0	0	0	0	3	0	0	0	1	32	0	0	0	0	0	0	36	520
8:25 AM	0	0	0	0	9	0	0	0	2	30	0	0	0	0	0	0	41	529
8:30 AM	0	0	0	0	3	0	0	0	1	28	0	0	0	0	0	0	32	521
8:35 AM	0	0	0	0	4	0	0	0	1	21	0	0	0	0	0	0	26	519
8:40 AM	0	0	0	0	10	0	0	0	1	32	0	0	0	0	0	0	43	516
8:45 AM	0	0	0	0	2	0	0	0	1	27	0	0	0	0	0	0	30	501
8:50 AM	0	0	0	0	3	0	0	0	1	29	0	0	0	0	0	0	33	472
8:55 AM	0	0	0	0	13	0	0	0	3	25	0	0	0	0	0	0	41	464

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	64	0	0	0	16	588	0	0	0	0	0	0	668
Heavy Trucks	0	0	0		0	0	0		0	16	0		0	0	0		16
Pedestrians		0				0				20				4			24
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 1/30/2012 5:49 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

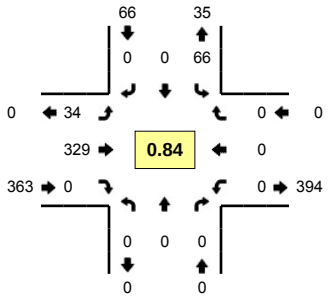
LOCATION: Fulton St -- Tuolumne St

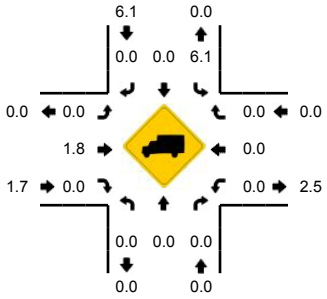
CITY/STATE: Fresno, CA

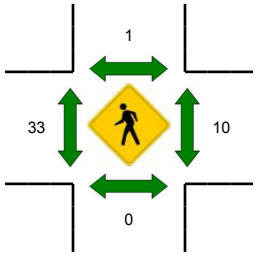
QC JOB #: 10705104

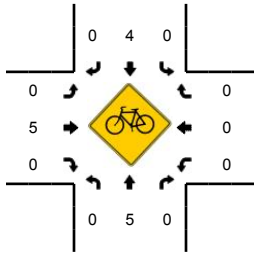
DATE: Thu, Jan 26 2012

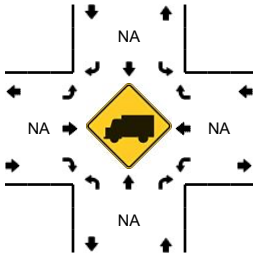
Peak-Hour: 4:30 PM -- 5:30 PM
Peak 15-Min: 4:55 PM -- 5:10 PM

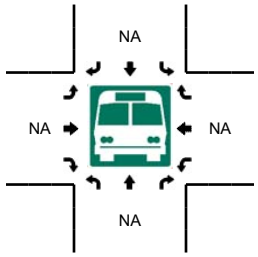












5-Min Count Period Beginning At	Fulton St (Northbound)				Fulton St (Southbound)				Tuolumne St (Eastbound)				Tuolumne St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	5	0	0	0	0	16	0	0	0	0	0	0	21	
4:05 PM	0	0	0	0	3	0	0	0	0	27	0	0	0	0	0	0	30	
4:10 PM	0	0	0	0	4	0	0	0	1	30	0	0	0	0	0	0	35	
4:15 PM	0	0	0	0	3	0	0	0	0	33	0	0	0	0	0	0	36	
4:20 PM	0	0	0	0	5	0	0	0	1	26	0	0	0	0	0	0	32	
4:25 PM	0	0	0	0	4	0	0	0	0	26	0	0	0	0	0	0	30	
4:30 PM	0	0	0	0	4	0	0	0	0	28	0	0	0	0	0	0	32	
4:35 PM	0	0	0	0	11	0	0	0	1	33	0	0	0	0	0	0	45	
4:40 PM	0	0	0	0	7	0	0	0	0	23	0	0	0	0	0	0	30	
4:45 PM	0	0	0	0	3	0	0	0	0	17	0	0	0	0	0	0	20	
4:50 PM	0	0	0	0	5	0	0	0	2	32	0	0	0	0	0	0	39	
4:55 PM	0	0	0	0	11	0	0	1	3	24	0	0	0	0	0	0	39	389
5:00 PM	0	0	0	0	3	0	0	0	7	23	0	0	0	0	0	0	33	401
5:05 PM	0	0	0	0	6	0	0	0	10	39	0	0	0	0	0	0	55	426
5:10 PM	0	0	0	0	4	0	0	0	8	25	0	0	0	0	0	0	37	428
5:15 PM	0	0	0	0	1	0	0	0	2	26	0	0	0	0	0	0	29	421
5:20 PM	0	0	0	0	5	0	0	0	1	28	0	0	0	0	0	0	34	423
5:25 PM	0	0	0	0	5	0	0	0	0	31	0	0	0	0	0	0	36	429
5:30 PM	0	0	0	0	2	0	0	0	0	21	0	0	0	0	0	0	23	420
5:35 PM	0	0	0	0	4	0	0	0	3	27	0	0	0	0	0	0	34	409
5:40 PM	0	0	0	0	2	0	0	0	3	16	0	0	0	0	0	0	21	400
5:45 PM	0	0	0	0	4	0	0	0	2	24	0	0	0	0	0	0	30	410
5:50 PM	0	0	0	0	2	0	0	0	1	16	0	0	0	0	0	0	19	390
5:55 PM	0	0	0	0	5	0	0	0	1	14	0	0	0	0	0	0	20	371

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	80	0	0	4	80	344	0	0	0	0	0	0	508
Heavy Trucks	0	0	0		4	0	0		0	4	0		0	0	0		8
Pedestrians		0				0				32				16			48
Bicycles	0	4	0		0	0	0		0	4	0		0	0	0		8
Railroad																	
Stopped Buses																	

Comments:

Report generated on 1/30/2012 5:49 PM

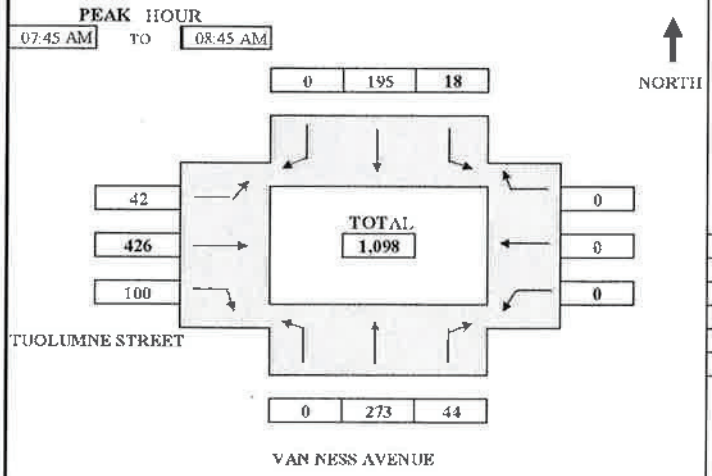
SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

B.A.Y.M.E.T.R.I.C.S.

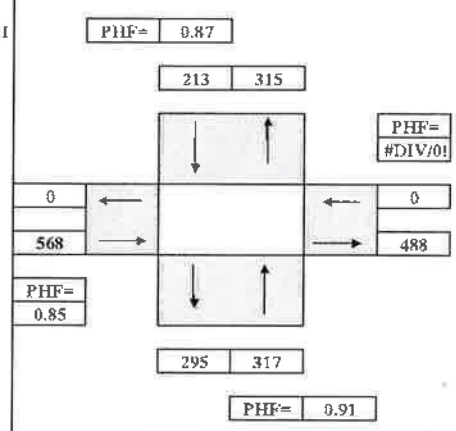
INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT:	HST PROJECT	SURVEY DATE:	11/3/2009	DAY:	TUESDAY
N-S APPROACH:	VAN NESS AVENUE	SURVEY TIME:	7:00 AM	TO	9:00 AM
E-W APPROACH:	TUOLUMNE STREET	CITY:	FRESNO	FILE:	2911072-14AM

PEAK HOUR
07:45 AM TO 08:45 AM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD From		To	NORTHBOUND Left	Thru	Right	SOUTHBOUND Left	Thru	Right	EASTBOUND Left	Thru	Right	WESTBOUND Left	Thru	Right	TOTAL
SURVEY DATA															
7:00 AM	---	7:15 AM	0	30	2	1	8	0	4	47	7	0	0	0	*99*
7:15 AM	---	7:30 AM	0	69	6	2	36	0	12	120	24	0	0	0	*269*
7:30 AM	---	7:45 AM	0	136	12	5	68	0	18	228	43	0	0	0	*510*
7:45 AM	---	8:00 AM	0	208	24	10	124	0	31	367	58	0	0	0	*822*
8:00 AM	---	8:15 AM	0	265	32	15	174	0	43	475	95	0	0	0	*1,099*
8:15 AM	---	8:30 AM	0	333	45	20	212	0	54	560	118	0	0	0	*1,342*
8:30 AM	---	8:45 AM	0	409	56	23	263	0	60	654	143	0	0	0	*1,608*
8:45 AM	---	9:00 AM	0	466	69	25	293	0	71	738	159	0	0	0	*1,821*
TOTAL BY PERIOD															
7:00 AM	---	7:15 AM	0	30	2	1	8	0	4	47	7	0	0	0	*99*
7:15 AM	---	7:30 AM	0	39	4	1	28	0	8	73	17	0	0	0	*170*
7:30 AM	---	7:45 AM	0	67	6	3	32	0	6	108	19	0	0	0	*241*
7:45 AM	---	8:00 AM	0	72	12	5	56	0	13	139	15	0	0	0	*312*
8:00 AM	---	8:15 AM	0	57	8	5	50	0	12	108	37	0	0	0	*277*
8:15 AM	---	8:30 AM	0	68	13	5	38	0	11	85	23	0	0	0	*243*
8:30 AM	---	8:45 AM	0	76	11	3	51	0	6	94	25	0	0	0	*266*
8:45 AM	---	9:00 AM	0	57	13	2	30	0	11	84	16	0	0	0	*213*
HOURLY TOTALS															
7:00 AM	---	8:00 AM	0	208	24	10	124	0	31	367	58	0	0	0	*822*
7:15 AM	---	8:15 AM	0	235	30	14	166	0	39	428	88	0	0	0	*1,000*
7:30 AM	---	8:30 AM	0	264	39	18	176	0	42	440	94	0	0	0	*1,073*
7:45 AM	---	8:45 AM	0	273	44	18	195	0	42	426	100	0	0	0	*1,098*
8:00 AM	---	9:00 AM	0	258	45	15	169	0	40	371	101	0	0	0	*999*

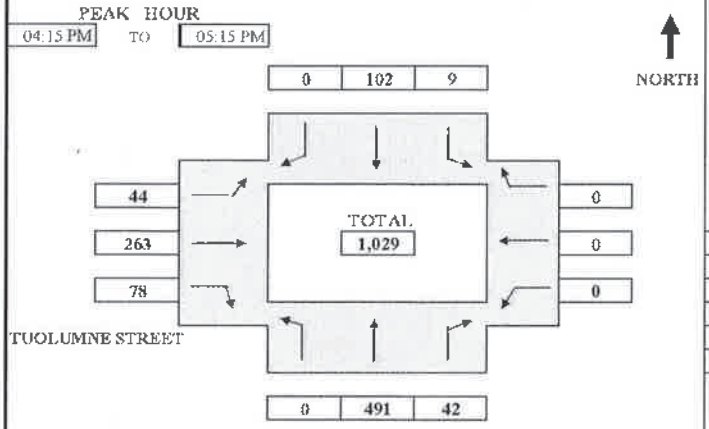
Telephone: (510)232-1271 Fax: (510)232-1272

B.A.Y.M.E.T.R.I.C.S.

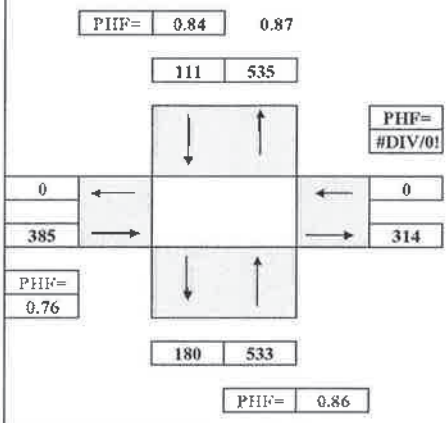
INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT:	HST PROJECT	SURVEY DATE:	11/3/2009	DAY:	TUESDAY
N-S APPROACH:	VAN NESS AVENUE	SURVEY TIME:	4:00 PM	TO	6:00 PM
E-W APPROACH:	TUOLUMNE STREET	CITY:	FRESNO	FILE:	2911072-14PM

PEAK HOUR
04:15 PM TO 05:15 PM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD From	To	NORTHBOUND Left	Thru	Right	SOUTHBOUND Left	Thru	Right	EASTBOUND Left	Thru	Right	WESTBOUND Left	Thru	Right	TOTAL
SURVEY DATA														
4:00 PM ---	4:15 PM	0	123	9	2	31	0	15	64	30	0	0	0	*274*
4:15 PM ---	4:30 PM	0	226	18	4	61	0	21	124	47	0	0	0	*501*
4:30 PM ---	4:45 PM	0	347	29	7	86	0	28	186	67	0	0	0	*750*
4:45 PM ---	5:00 PM	0	474	36	8	116	0	34	247	86	0	0	0	*1,001*
5:00 PM ---	5:15 PM	0	614	51	11	133	0	59	327	108	0	0	0	*1,303*
5:15 PM ---	5:30 PM	0	715	67	13	153	0	68	394	116	0	0	0	*1,526*
5:30 PM ---	5:45 PM	0	825	79	15	172	0	87	453	128	0	0	0	*1,759*
5:45 PM ---	6:00 PM	0	890	87	15	186	0	87	490	139	0	0	0	*1,894*
TOTAL BY PERIOD														
4:00 PM ---	4:15 PM	0	123	9	2	31	0	15	64	30	0	0	0	*274*
4:15 PM ---	4:30 PM	0	103	9	2	30	0	6	60	17	0	0	0	*227*
4:30 PM ---	4:45 PM	0	121	11	3	25	0	7	62	20	0	0	0	*249*
4:45 PM ---	5:00 PM	0	127	7	1	30	0	6	61	19	0	0	0	*251*
5:00 PM ---	5:15 PM	0	140	15	3	17	0	25	80	22	0	0	0	*302*
5:15 PM ---	5:30 PM	0	101	16	2	20	0	9	67	8	0	0	0	*223*
5:30 PM ---	5:45 PM	0	110	12	2	19	0	19	59	12	0	0	0	*233*
5:45 PM ---	6:00 PM	0	65	8	0	14	0	0	37	11	0	0	0	*135*
HOURLY TOTALS														
4:00 PM ---	5:00 PM	0	474	36	8	116	0	34	247	86	0	0	0	*1,001*
4:15 PM ---	5:15 PM	0	491	42	9	102	0	44	263	78	0	0	0	*1,029*
4:30 PM ---	5:30 PM	0	489	49	9	92	0	47	270	69	0	0	0	*1,025*
4:45 PM ---	5:45 PM	0	478	50	8	86	0	59	267	61	0	0	0	*1,009*
5:00 PM ---	6:00 PM	0	416	51	7	70	0	53	243	53	0	0	0	*893*

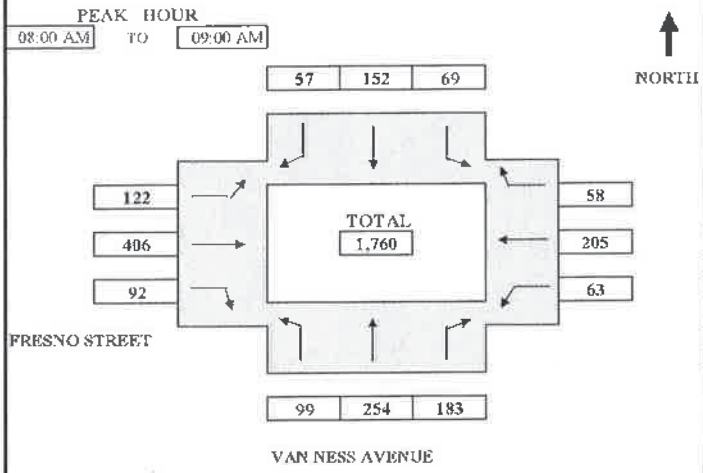
Telephone: (510)232-1271 Fax: (510)232-1272

B.A.Y.M.E.T.R.I.C.S.

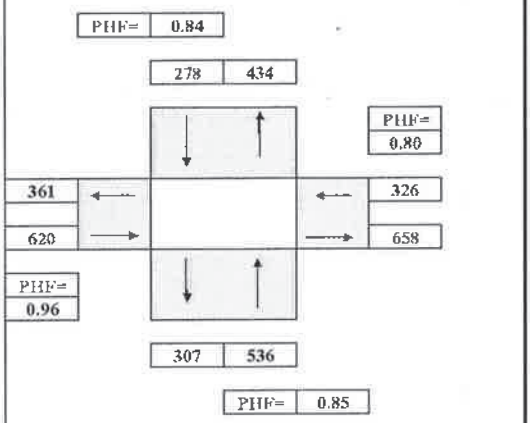
INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT:	HST PROJECT	SURVEY DATE:	11/3/2009	DAY:	TUESDAY
N-S APPROACH:	VAN NESS AVENUE	SURVEY TIME:	7:00 AM	TO	9:00 AM
E-W APPROACH:	FRESNO STREET	CITY:	FRESNO	FILE:	2911072-15AM

PEAK HOUR
08:00 AM TO 09:00 AM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD From	To	NORTHBOUND Left	Thru	Right	SOUTHBOUND Left	Thru	Right	EASTBOUND Left	Thru	Right	WESTBOUND Left	Thru	Right	TOTAL
SURVEY DATA														
7:00 AM ---	7:15 AM	16	29	12	5	13	3	6	46	10	6	27	5	*178*
7:15 AM ---	7:30 AM	29	68	26	14	38	17	17	107	20	14	48	15	*413*
7:30 AM ---	7:45 AM	53	123	58	23	63	27	35	180	45	22	105	24	*758*
7:45 AM ---	8:00 AM	68	185	80	35	105	36	65	281	68	33	171	34	*1,161*
8:00 AM ---	8:15 AM	93	239	117	58	149	52	95	385	95	46	221	39	*1,589*
8:15 AM ---	8:30 AM	121	311	172	70	184	69	118	488	118	69	267	55	*2,042*
8:30 AM ---	8:45 AM	155	387	219	88	222	78	139	601	143	74	314	74	*2,494*
8:45 AM ---	9:00 AM	167	439	263	104	257	93	187	687	160	96	376	92	*2,921*
TOTAL BY PERIOD														
7:00 AM ---	7:15 AM	16	29	12	5	13	3	6	46	10	6	27	5	*178*
7:15 AM ---	7:30 AM	13	39	14	9	25	14	11	61	10	8	21	10	*235*
7:30 AM ---	7:45 AM	24	55	32	9	25	10	18	73	25	8	57	9	*345*
7:45 AM ---	8:00 AM	15	62	22	12	42	9	30	101	23	11	66	10	*403*
8:00 AM ---	8:15 AM	25	54	37	23	44	16	30	104	27	13	50	5	*428*
8:15 AM ---	8:30 AM	28	72	55	12	35	17	23	103	23	23	46	16	*453*
8:30 AM ---	8:45 AM	34	76	47	18	38	9	21	113	25	5	47	19	*452*
8:45 AM ---	9:00 AM	12	52	44	16	35	15	48	86	17	22	62	18	*427*
HOURLY TOTALS														
7:00 AM ---	8:00 AM	68	185	80	35	105	36	65	281	68	33	171	34	*1,161*
7:15 AM ---	8:15 AM	77	210	105	53	136	49	89	339	85	40	194	34	*1,411*
7:30 AM ---	8:30 AM	92	243	146	56	146	52	101	381	98	55	219	40	*1,629*
7:45 AM ---	8:45 AM	102	264	161	65	159	51	104	421	98	52	209	50	*1,736*
8:00 AM ---	9:00 AM	99	254	183	69	152	57	122	406	92	63	205	58	*1,760*

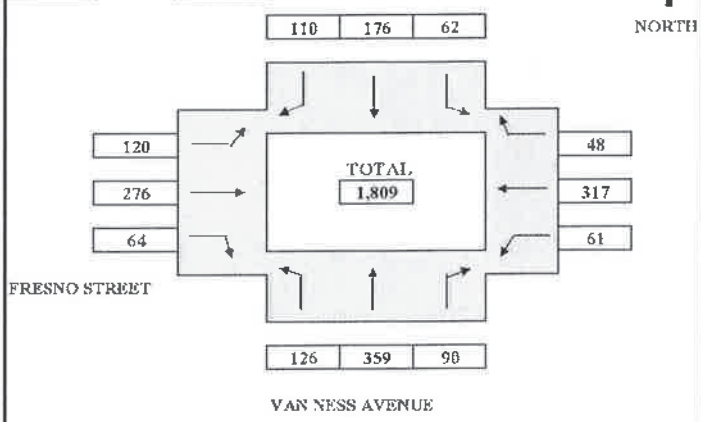
Telephone: (510)232-1271 Fax: (510)232-1272

B.A.Y.M.E.T.R.I.C.S.

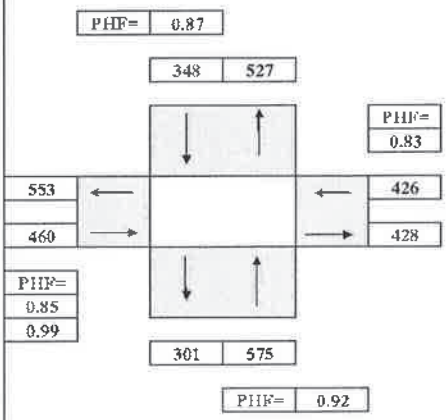
INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT:	IIST PROJECT	SURVEY DATE:	11/3/2009	DAY:	TUESDAY
N-S APPROACH:	VAN NESS AVENUE	SURVEY TIME:	4:00 PM	TO	6:00 PM
E-W APPROACH:	FRESNO STREET	CITY:	FRESNO	FILE:	2911072-15PM

PEAK HOUR
04:00 PM TO 05:00 PM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD From		To	NORTHBOUND Left	Thru	Right	SOUTHBOUND Left	Thru	Right	EASTBOUND Left	Thru	Right	WESTBOUND Left	Thru	Right	TOTAL
SURVEY DATA															
4:00 PM	---	4:15 PM	39	96	19	19	35	29	30	76	10	18	76	9	*456*
4:15 PM	---	4:30 PM	60	183	40	38	84	61	63	137	32	31	135	20	*884*
4:30 PM	---	4:45 PM	93	287	60	52	130	90	89	206	51	47	230	37	*1,372*
4:45 PM	---	5:00 PM	126	359	90	62	176	110	120	276	64	61	317	48	*1,809*
5:00 PM	---	5:15 PM	156	454	99	75	214	125	146	371	79	75	402	56	*2,252*
5:15 PM	---	5:30 PM	179	535	107	84	241	134	171	432	90	87	467	62	*2,589*
5:30 PM	---	5:45 PM	203	587	118	92	261	150	188	485	98	97	524	70	*2,873*
5:45 PM	---	6:00 PM	216	625	121	101	275	157	201	532	105	109	578	79	*3,099*
TOTAL BY PERIOD															
4:00 PM	---	4:15 PM	39	96	19	19	35	29	30	76	10	18	76	9	*456*
4:15 PM	---	4:30 PM	21	87	21	19	49	32	33	61	22	13	59	11	*428*
4:30 PM	---	4:45 PM	33	104	20	14	46	29	26	69	19	16	95	17	*488*
4:45 PM	---	5:00 PM	33	72	30	10	46	20	31	70	13	14	87	11	*437*
5:00 PM	---	5:15 PM	30	95	9	13	38	15	26	95	15	14	85	8	*443*
5:15 PM	---	5:30 PM	23	81	8	9	27	9	25	61	11	12	65	6	*337*
5:30 PM	---	5:45 PM	24	52	11	8	20	16	17	53	8	10	57	8	*284*
5:45 PM	---	6:00 PM	13	38	3	9	14	7	13	47	7	12	54	9	*226*
HOURLY TOTALS															
4:00 PM	---	5:00 PM	126	359	90	62	176	110	120	276	64	61	317	48	*1,809*
4:15 PM	---	5:15 PM	117	358	80	56	179	96	116	295	69	57	326	47	*1,796*
4:30 PM	---	5:30 PM	119	352	67	46	157	73	108	295	58	56	332	42	*1,705*
4:45 PM	---	5:45 PM	110	300	58	40	131	60	99	279	47	50	294	33	*1,501*
5:00 PM	---	6:00 PM	90	266	31	39	99	47	81	256	41	48	261	31	*1,290*

Telephone: (510)232-1271 Fax: (510)232-1272

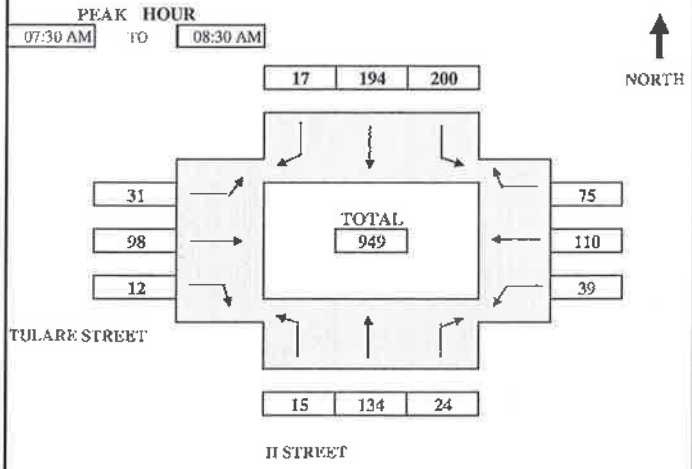
B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

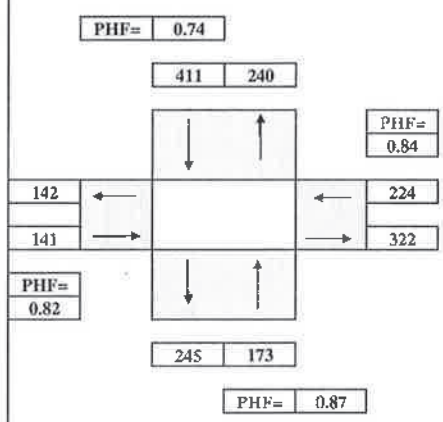
PROJECT:	HST PROJECT	SURVEY DATE:	11/12/2009	DAY:	THURSDAY
N-S APPROACH:	H STREET	SURVEY TIME:	7:00 AM	TO	9:00 AM
E-W APPROACH:	TULARE STREET	CITY:	FRESNO	FILE:	2911072-44AM

PEAK HOUR

07:30 AM TO 08:30 AM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD From		To	NORTHBOUND Left	Thru	Right	SOUTHBOUND Left	Thru	Right	EASTBOUND Left	Thru	Right	WESTBOUND Left	Thru	Right	TOTAL
SURVEY DATA															
7:00 AM	---	7:15 AM	0	14	4	18	24	2	1	12	1	3	8	4	*91*
7:15 AM	---	7:30 AM	1	48	7	70	56	6	6	21	2	5	23	19	*264*
7:30 AM	---	7:45 AM	3	82	10	111	97	8	13	44	4	8	53	31	*464*
7:45 AM	---	8:00 AM	8	117	18	178	161	16	21	76	7	14	79	47	*742*
8:00 AM	---	8:15 AM	12	147	20	226	214	21	30	97	13	30	107	70	*987*
8:15 AM	---	8:30 AM	16	182	31	270	250	23	37	119	14	44	133	94	*1,213*
8:30 AM	---	8:45 AM	20	200	38	309	283	29	41	137	17	53	155	115	*1,397*
8:45 AM	---	9:00 AM	22	224	46	346	316	37	44	163	18	59	185	143	*1,603*
TOTAL BY PERIOD															
7:00 AM	---	7:15 AM	0	14	4	18	24	2	1	12	1	3	8	4	*91*
7:15 AM	---	7:30 AM	1	34	3	52	32	4	5	9	1	2	15	15	*173*
7:30 AM	---	7:45 AM	2	34	3	41	41	2	7	23	2	3	30	12	*200*
7:45 AM	---	8:00 AM	5	35	8	67	64	8	8	32	3	6	26	16	*278*
8:00 AM	---	8:15 AM	4	30	2	48	53	5	9	21	6	16	28	23	*245*
8:15 AM	---	8:30 AM	4	35	11	44	36	2	7	22	1	14	26	24	*226*
8:30 AM	---	8:45 AM	4	18	7	39	33	6	4	18	3	9	22	21	*184*
8:45 AM	---	9:00 AM	2	24	8	37	33	8	3	26	1	6	30	28	*206*
HOURLY TOTALS															
7:00 AM	---	8:00 AM	8	117	18	178	161	16	21	76	7	14	79	47	*742*
7:15 AM	---	8:15 AM	12	133	16	208	190	19	29	85	12	27	99	66	*896*
7:30 AM	---	8:30 AM	15	134	24	200	194	17	31	98	12	39	110	75	*949*
7:45 AM	---	8:45 AM	17	118	28	198	186	21	28	93	13	45	102	84	*933*
8:00 AM	---	9:00 AM	14	107	28	168	155	21	23	87	11	45	106	96	*861*

Telephone: (510)232-1271 Fax: (510)232-1272

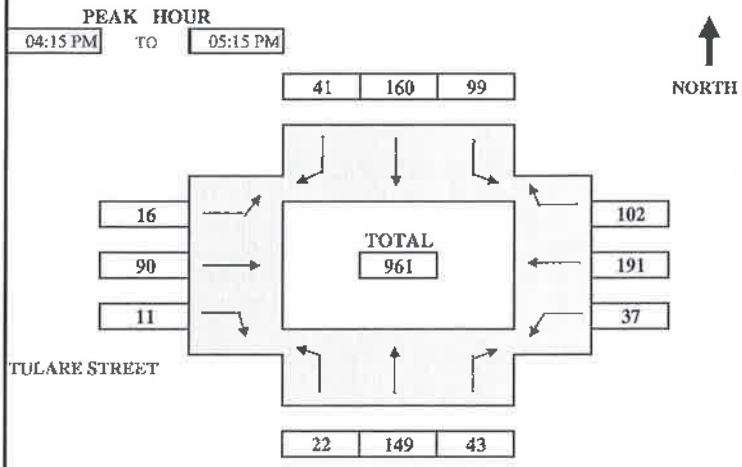
B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

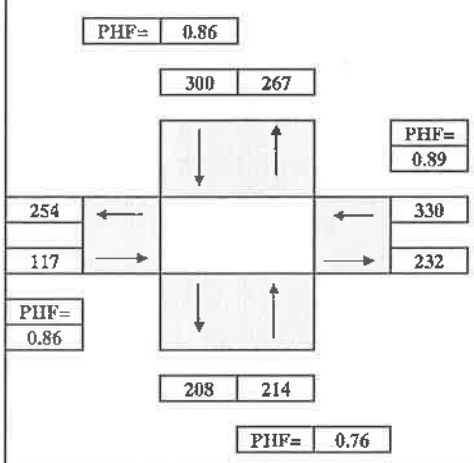
PROJECT:	HST PROJECT	SURVEY DATE:	11/12/2009	DAY:	THURSDAY
N-S APPROACH:	H STREET	SURVEY TIME:	4:00 PM	TO	6:00 PM
E-W APPROACH:	TULARE STREET	CITY:	FRESNO	FILE:	2911072-44PM

PEAK HOUR

04:15 PM TO 05:15 PM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD From		To	NORTHBOUND Left	Thru	Right	SOUTHBOUND Left	Thru	Right	EASTBOUND Left	Thru	Right	WESTBOUND Left	Thru	Right	TOTAL
SURVEY DATA															
4:00 PM	---	4:15 PM	2	27	13	27	39	9	5	23	5	6	55	28	*239*
4:15 PM	---	4:30 PM	5	57	22	55	75	21	6	48	5	18	102	51	*465*
4:30 PM	---	4:45 PM	14	96	29	81	117	29	10	70	10	24	146	73	*699*
4:45 PM	---	5:00 PM	17	124	45	104	148	36	14	96	14	37	190	99	*924*
5:00 PM	---	5:15 PM	24	176	56	126	199	50	21	113	16	43	246	130	*1,200*
5:15 PM	---	5:30 PM	25	207	63	143	221	59	24	136	16	52	288	141	*1,375*
5:30 PM	---	5:45 PM	27	226	68	156	239	63	29	162	16	54	321	151	*1,512*
5:45 PM	---	6:00 PM	29	242	70	171	267	69	31	173	17	54	341	167	*1,631*
TOTAL BY PERIOD															
4:00 PM	---	4:15 PM	2	27	13	27	39	9	5	23	5	6	55	28	*239*
4:15 PM	---	4:30 PM	3	30	9	28	36	12	1	25	0	12	47	23	*226*
4:30 PM	---	4:45 PM	9	39	7	26	42	8	4	22	5	6	44	22	*234*
4:45 PM	---	5:00 PM	3	28	16	23	31	7	4	26	4	13	44	26	*225*
5:00 PM	---	5:15 PM	7	52	11	22	51	14	7	17	2	6	56	31	*276*
5:15 PM	---	5:30 PM	1	31	7	17	22	9	3	23	0	9	42	11	*175*
5:30 PM	---	5:45 PM	2	19	5	13	18	4	5	26	0	2	33	10	*137*
5:45 PM	---	6:00 PM	2	16	2	15	28	6	2	11	1	0	20	16	*119*
HOURLY TOTALS															
4:00 PM	---	5:00 PM	17	124	45	104	148	36	14	96	14	37	190	99	*924*
4:15 PM	---	5:15 PM	22	149	43	99	160	41	16	90	11	37	191	102	*961*
4:30 PM	---	5:30 PM	20	150	41	88	146	38	18	88	11	34	186	90	*910*
4:45 PM	---	5:45 PM	13	130	39	75	122	34	19	92	6	30	175	78	*813*
5:00 PM	---	6:00 PM	12	118	25	67	119	33	17	77	3	17	151	68	*707*

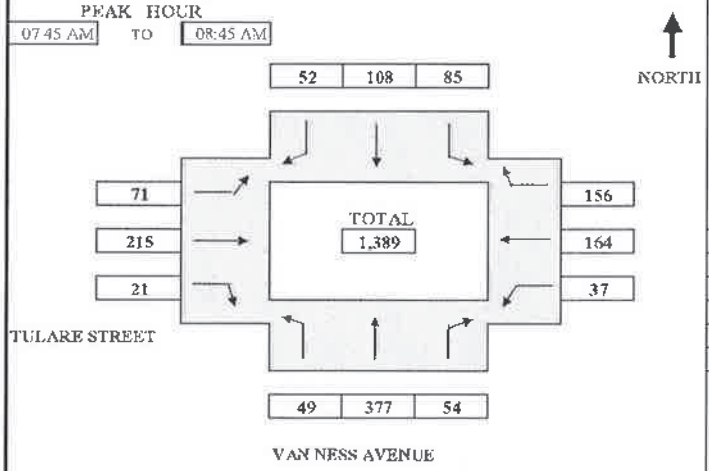
Telephone: (510)232-1271 Fax: (510)232-1272

B.A.Y.M.E.T.R.I.C.S.

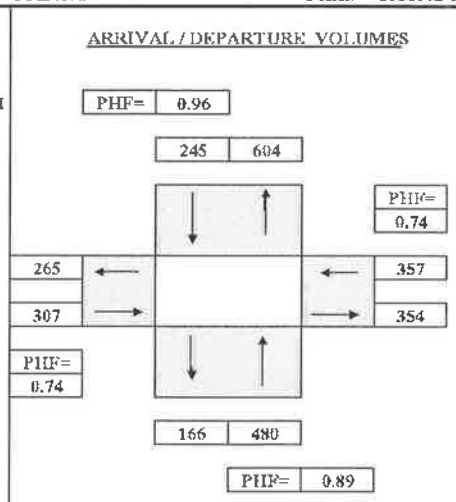
INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT:	HST PROJECT	SURVEY DATE:	11/3/2009	DAY:	TUESDAY
N-S APPROACH:	VAN NESS AVENUE	SURVEY TIME:	7:00 AM	TO	9:00 AM
E-W APPROACH:	TULARE STREET	CITY:	FRESNO	FILE:	2911072-16AM

PEAK HOUR
07:45 AM TO 08:45 AM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD From		To	NORTHBOUND Left	Thru	Right	SOUTHBOUND Left	Thru	Right	EASTBOUND Left	Thru	Right	WESTBOUND Left	Thru	Right	TOTAL
SURVEY DATA															
7:00 AM	---	7:15 AM	3	47	10	12	15	6	6	25	2	3	15	13	*157*
7:15 AM	---	7:30 AM	11	131	18	22	38	12	19	75	6	9	39	35	*415*
7:30 AM	---	7:45 AM	20	207	31	37	60	15	22	119	7	12	80	67	*677*
7:45 AM	---	8:00 AM	35	311	47	57	90	28	38	202	12	21	125	97	*1,063*
8:00 AM	---	8:15 AM	49	395	58	79	109	47	52	247	15	27	162	133	*1,373*
8:15 AM	---	8:30 AM	63	493	70	107	139	53	77	299	20	40	212	190	*1,763*
8:30 AM	---	8:45 AM	69	584	85	122	168	67	93	334	28	49	244	223	*2,066*
8:45 AM	---	9:00 AM	85	657	103	141	193	78	102	383	31	62	286	285	*2,406*
TOTAL BY PERIOD															
7:00 AM	---	7:15 AM	3	47	10	12	15	6	6	25	2	3	15	13	*157*
7:15 AM	---	7:30 AM	8	84	8	10	23	6	13	50	4	6	24	22	*258*
7:30 AM	---	7:45 AM	9	76	13	15	22	3	3	44	1	3	41	32	*262*
7:45 AM	---	8:00 AM	15	104	16	20	30	13	16	83	5	9	45	30	*386*
8:00 AM	---	8:15 AM	14	84	11	22	19	19	14	45	3	6	37	36	*310*
8:15 AM	---	8:30 AM	14	98	12	28	30	6	25	52	5	13	50	57	*390*
8:30 AM	---	8:45 AM	6	91	15	15	29	14	16	35	8	9	32	33	*303*
8:45 AM	---	9:00 AM	16	73	18	19	25	11	9	49	3	13	42	62	*340*
HOURLY TOTALS															
7:00 AM	---	8:00 AM	35	311	47	57	90	28	38	202	12	21	125	97	*1,063*
7:15 AM	---	8:15 AM	46	348	48	67	94	41	46	222	13	24	147	120	*1,216*
7:30 AM	---	8:30 AM	52	362	52	85	101	41	58	224	14	31	173	155	*1,348*
7:45 AM	---	8:45 AM	49	377	54	85	108	52	71	215	21	37	164	156	*1,389*
8:00 AM	---	9:00 AM	50	346	56	84	103	50	64	181	19	41	161	188	*1,343*

Telephone: (510)232-1271 Fax: (510)232-1272

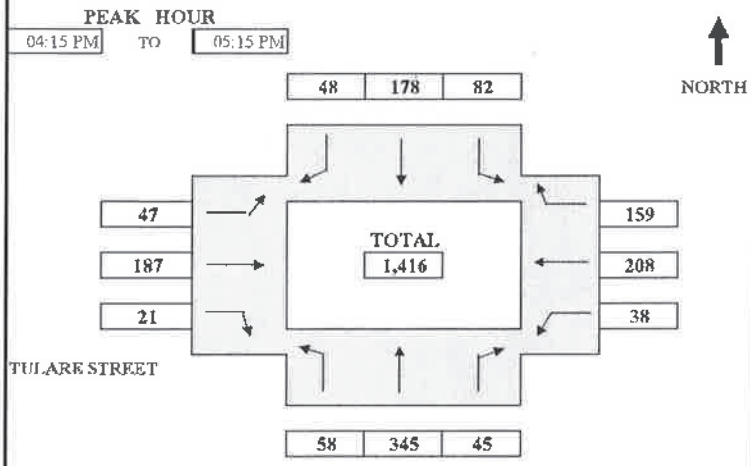
B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

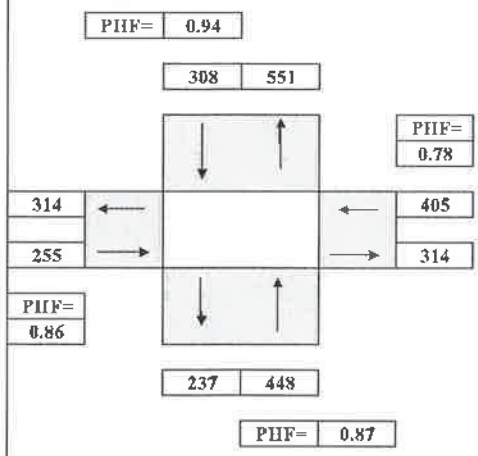
PROJECT:	HST PROJECT	SURVEY DATE:	11/3/2009	DAY:	TUESDAY
N-S APPROACH:	VAN NESS AVENUE	SURVEY TIME:	4:00 PM	TO	6:00 PM
E-W APPROACH:	TULARE STREET	CITY:	FRESNO	FILE:	2911072-16PM

PEAK HOUR

04:15 PM TO 05:15 PM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD From		To	NORTHBOUND Left	Thru	Right	SOUTHBOUND Left	Thru	Right	EASTBOUND Left	Thru	Right	WESTBOUND Left	Thru	Right	TOTAL
SURVEY DATA															
4:00 PM	---	4:15 PM	12	104	10	18	46	11	7	48	7	10	44	44	*361*
4:15 PM	---	4:30 PM	20	165	17	36	87	24	19	80	11	21	85	83	*648*
4:30 PM	---	4:45 PM	38	257	31	57	133	38	27	127	18	29	128	134	*1,017*
4:45 PM	---	5:00 PM	50	360	45	74	184	52	43	179	21	37	178	159	*1,382*
5:00 PM	---	5:15 PM	70	449	55	100	224	59	54	235	28	48	252	203	*1,777*
5:15 PM	---	5:30 PM	77	516	60	112	252	67	58	273	29	50	283	228	*2,005*
5:30 PM	---	5:45 PM	80	584	72	125	272	73	68	306	33	53	314	255	*2,235*
5:45 PM	---	6:00 PM	85	610	78	138	292	77	71	343	37	61	352	271	*2,415*
TOTAL BY PERIOD															
4:00 PM	---	4:15 PM	12	104	10	18	46	11	7	48	7	10	44	44	*361*
4:15 PM	---	4:30 PM	8	61	7	18	41	13	12	32	4	11	41	39	*287*
4:30 PM	---	4:45 PM	18	92	14	21	46	14	8	47	7	8	43	51	*369*
4:45 PM	---	5:00 PM	12	103	14	17	51	14	16	52	3	8	50	25	*365*
5:00 PM	---	5:15 PM	20	89	10	26	40	7	11	56	7	11	74	44	*395*
5:15 PM	---	5:30 PM	7	67	5	12	28	8	4	38	1	2	31	25	*228*
5:30 PM	---	5:45 PM	3	68	12	13	20	6	10	33	4	3	31	27	*230*
5:45 PM	---	6:00 PM	5	26	6	13	20	4	3	37	4	8	38	16	*180*
HOURLY TOTALS															
4:00 PM	---	5:00 PM	50	360	45	74	184	52	43	179	21	37	178	159	*1,382*
4:15 PM	---	5:15 PM	58	345	45	82	178	48	47	187	21	38	208	159	*1,416*
4:30 PM	---	5:30 PM	57	351	43	76	165	43	39	193	18	29	198	145	*1,357*
4:45 PM	---	5:45 PM	42	327	41	68	139	35	41	179	15	24	186	121	*1,218*
5:00 PM	---	6:00 PM	35	250	33	64	108	25	28	164	16	24	174	112	*1,033*

Telephone: (510)232-1271 Fax: (510)232-1272

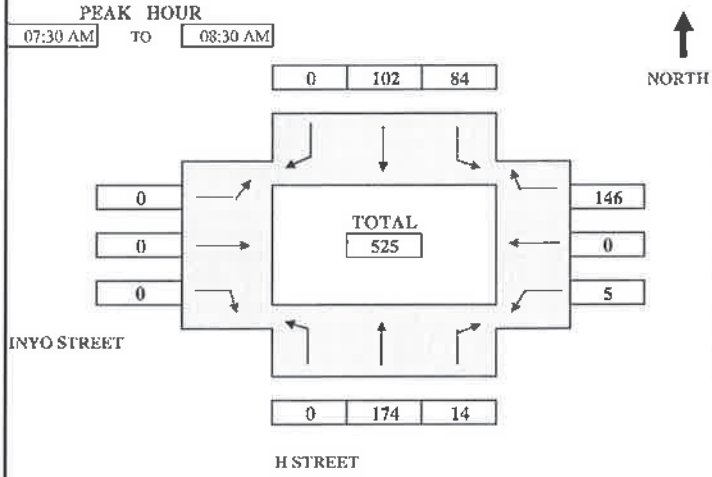
B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

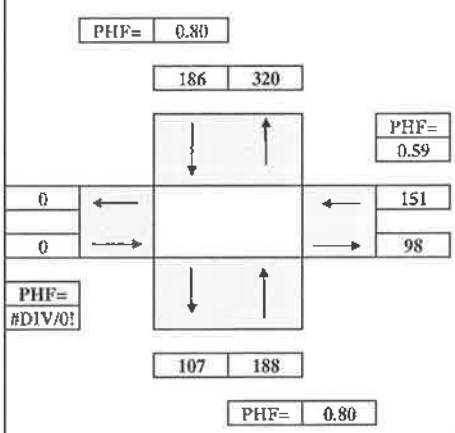
PROJECT:	HST PROJECT	SURVEY DATE:	11/12/2009	DAY:	THURSDAY
N-S APPROACH:	H STREET	SURVEY TIME:	7:00 AM	TO	9:00 AM
E-W APPROACH:	INYO STREET	CITY:	FRESNO	FILE:	2911072-75AM

PEAK HOUR

07:30 AM TO 08:30 AM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD From		To	NORTHBOUND Left	Thru	Right	SOUTHBOUND Left	Thru	Right	EASTBOUND Left	Thru	Right	WESTBOUND Left	Thru	Right	TOTAL
SURVEY DATA															
7:00 AM	---	7:15 AM	0	14	3	12	15	0	0	0	0	0	0	9	*53*
7:15 AM	---	7:30 AM	0	46	6	27	32	0	0	0	0	1	0	20	*132*
7:30 AM	---	7:45 AM	0	85	8	48	55	0	0	0	0	3	0	44	*243*
7:45 AM	---	8:00 AM	0	131	13	73	88	0	0	0	0	3	0	71	*379*
8:00 AM	---	8:15 AM	0	163	18	97	110	0	0	0	0	6	0	132	*526*
8:15 AM	---	8:30 AM	0	220	20	111	134	0	0	0	0	6	0	166	*657*
8:30 AM	---	8:45 AM	0	241	21	126	159	0	0	0	0	6	0	187	*740*
8:45 AM	---	9:00 AM	0	262	22	138	185	0	0	0	0	9	0	201	*817*
TOTAL BY PERIOD															
7:00 AM	---	7:15 AM	0	14	3	12	15	0	0	0	0	0	0	9	*53*
7:15 AM	---	7:30 AM	0	32	3	15	17	0	0	0	0	1	0	11	*79*
7:30 AM	---	7:45 AM	0	39	2	21	23	0	0	0	0	2	0	24	*111*
7:45 AM	---	8:00 AM	0	46	5	25	33	0	0	0	0	0	0	27	*136*
8:00 AM	---	8:15 AM	0	32	5	24	22	0	0	0	0	3	0	61	*147*
8:15 AM	---	8:30 AM	0	57	2	14	24	0	0	0	0	0	0	34	*131*
8:30 AM	---	8:45 AM	0	21	1	15	25	0	0	0	0	0	0	21	*83*
8:45 AM	---	9:00 AM	0	21	1	12	26	0	0	0	0	3	0	14	*77*
HOURLY TOTALS															
7:00 AM	---	8:00 AM	0	131	13	73	88	0	0	0	0	3	0	71	*379*
7:15 AM	---	8:15 AM	0	149	15	85	95	0	0	0	0	6	0	123	*473*
7:30 AM	---	8:30 AM	0	174	14	84	102	0	0	0	0	5	0	146	*525*
7:45 AM	---	8:45 AM	0	156	13	78	104	0	0	0	0	3	0	143	*497*
8:00 AM	---	9:00 AM	0	131	9	65	97	0	0	0	0	6	0	130	*438*

Telephone: (510)232-1271 Fax: (510)232-1272

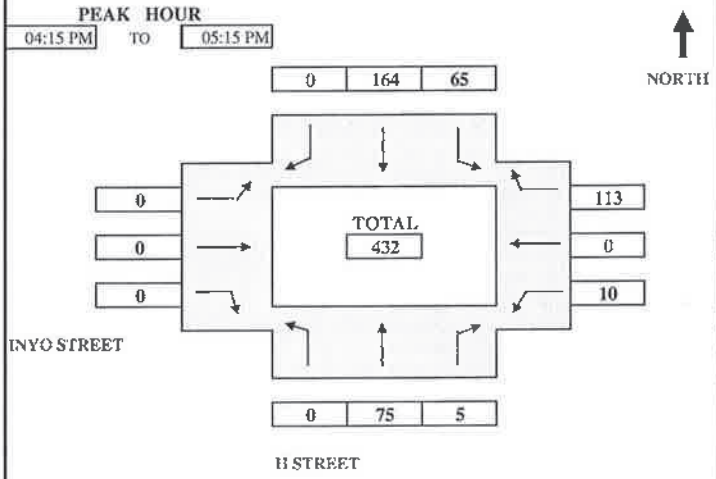
B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

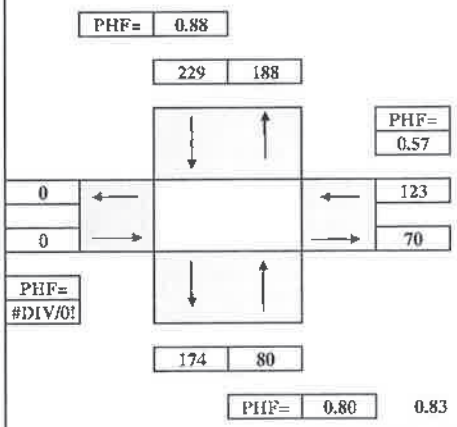
PROJECT:	HST PROJECT	SURVEY DATE:	11/12/2009	DAY:	THURSDAY
N-S APPROACH:	H STREET	SURVEY TIME:	4:00 PM	TO	6:00 PM
E-W APPROACH:	INYO STREET	CITY:	FRESNO	FILE:	2911072-75PM

PEAK HOUR

04:15 PM TO 05:15 PM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD From		To	NORTHBOUND Left	Thru	Right	SOUTHBOUND Left	Thru	Right	EASTBOUND Left	Thru	Right	WESTBOUND Left	Thru	Right	TOTAL
SURVEY DATA															
4:00 PM	---	4:15 PM	0	16	1	18	41	0	0	0	0	3	0	24	*103*
4:15 PM	---	4:30 PM	0	38	3	37	73	0	0	0	0	4	0	40	*195*
4:30 PM	---	4:45 PM	0	58	4	51	124	0	0	0	0	8	0	67	*312*
4:45 PM	---	5:00 PM	0	77	5	71	153	0	0	0	0	8	0	88	*402*
5:00 PM	---	5:15 PM	0	91	6	83	205	0	0	0	0	13	0	137	*535*
5:15 PM	---	5:30 PM	0	115	7	90	233	0	0	0	0	16	0	150	*611*
5:30 PM	---	5:45 PM	0	123	7	96	254	0	0	0	0	18	0	170	*668*
5:45 PM	---	6:00 PM	0	132	7	103	276	0	0	0	0	19	0	182	*719*
TOTAL BY PERIOD															
4:00 PM	---	4:15 PM	0	16	1	18	41	0	0	0	0	3	0	24	*103*
4:15 PM	---	4:30 PM	0	22	2	19	32	0	0	0	0	1	0	16	*92*
4:30 PM	---	4:45 PM	0	20	1	14	51	0	0	0	0	4	0	27	*117*
4:45 PM	---	5:00 PM	0	19	1	20	29	0	0	0	0	0	0	21	*90*
5:00 PM	---	5:15 PM	0	14	1	12	52	0	0	0	0	5	0	49	*133*
5:15 PM	---	5:30 PM	0	24	1	7	28	0	0	0	0	3	0	13	*76*
5:30 PM	---	5:45 PM	0	8	0	6	21	0	0	0	0	2	0	20	*57*
5:45 PM	---	6:00 PM	0	9	0	7	22	0	0	0	0	1	0	12	*51*
HOURLY TOTALS															
4:00 PM	---	5:00 PM	0	77	5	71	153	0	0	0	0	8	0	88	*402*
4:15 PM	---	5:15 PM	0	75	5	65	164	0	0	0	0	10	0	113	*432*
4:30 PM	---	5:30 PM	0	77	4	53	160	0	0	0	0	12	0	110	*416*
4:45 PM	---	5:45 PM	0	65	3	45	130	0	0	0	0	10	0	103	*356*
5:00 PM	---	6:00 PM	0	55	2	32	123	0	0	0	0	11	0	94	*317*

Telephone: (510)232-1271 Fax: (510)232-1272

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

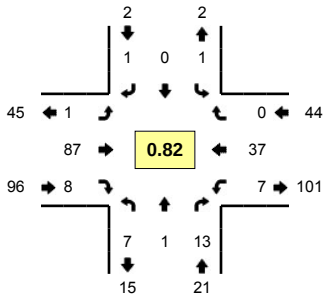
LOCATION: Fulton St -- Inyo St

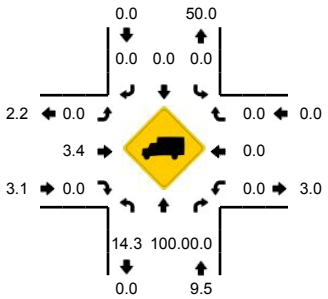
CITY/STATE: Fresno, CA

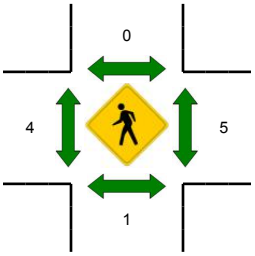
QC JOB #: 10705105

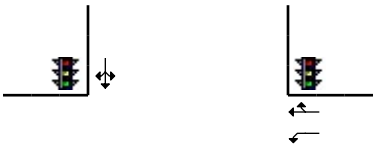
DATE: Thu, Jan 26 2012

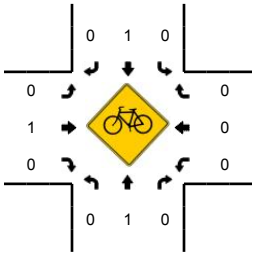
Peak-Hour: 7:50 AM -- 8:50 AM
Peak 15-Min: 7:50 AM -- 8:05 AM

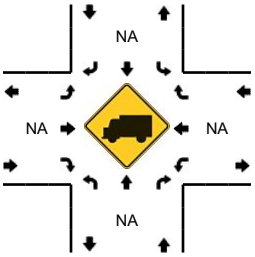


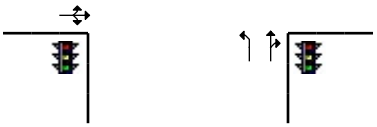


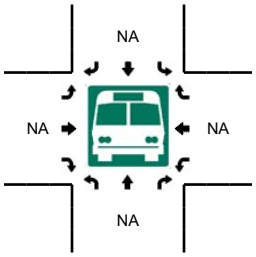












5-Min Count Period Beginning At	Fulton St (Northbound)				Fulton St (Southbound)				Inyo St (Eastbound)				Inyo St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	3	0	0	4	
7:05 AM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2	
7:10 AM	0	0	1	0	0	0	0	0	0	2	0	0	0	1	1	0	5	
7:15 AM	0	0	0	0	1	0	0	0	0	3	0	0	0	1	0	0	5	
7:20 AM	0	0	2	0	0	0	0	0	0	7	0	0	0	1	0	0	10	
7:25 AM	0	0	0	0	0	0	0	0	0	3	0	0	0	1	0	0	4	
7:30 AM	1	0	0	0	0	0	1	0	0	11	0	0	0	1	0	0	14	
7:35 AM	0	0	1	0	0	0	0	0	0	2	0	0	0	4	0	0	7	
7:40 AM	0	0	1	0	0	0	1	0	0	7	1	0	0	0	0	0	10	
7:45 AM	1	0	0	0	0	0	0	0	0	10	0	0	0	2	0	0	13	
7:50 AM	1	0	0	0	0	0	0	0	0	9	0	0	0	3	0	0	13	
7:55 AM	1	0	1	0	0	0	0	0	0	17	1	0	1	1	0	0	22	109
8:00 AM	1	0	1	0	0	0	0	0	0	10	0	0	0	3	0	0	15	120
8:05 AM	0	0	1	0	0	0	0	0	0	6	0	0	3	1	0	0	11	129
8:10 AM	0	0	0	0	0	0	0	0	0	6	0	0	0	5	0	0	11	135
8:15 AM	0	0	1	0	0	0	0	0	0	9	2	0	0	2	0	0	14	144
8:20 AM	1	0	2	0	0	0	0	0	0	11	2	0	1	1	0	0	18	152
8:25 AM	0	1	1	0	0	0	0	0	0	7	0	0	0	3	0	0	12	160
8:30 AM	2	0	1	0	0	0	0	0	0	2	0	0	0	6	0	0	11	157
8:35 AM	1	0	1	0	1	0	0	0	0	2	1	0	1	5	0	0	12	162
8:40 AM	0	0	1	0	0	0	1	0	1	5	0	0	0	1	0	0	9	161
8:45 AM	0	0	3	0	0	0	0	0	0	3	2	0	1	6	0	0	15	163
8:50 AM	0	0	1	0	0	0	0	0	0	3	0	0	1	3	0	0	8	158
8:55 AM	0	0	0	0	0	0	0	0	0	4	3	0	1	3	0	0	11	147

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	12	0	8	0	0	0	0	0	0	144	4	0	4	28	0	0	200
Heavy Trucks	4	0	0		0	0	0		0	4	0		0	0	0		8
Pedestrians		0				0				0				4			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 1/30/2012 5:49 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

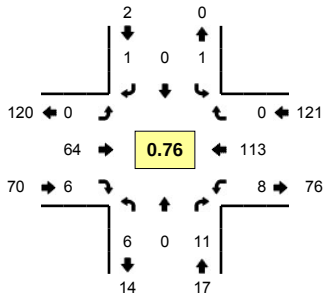
LOCATION: Fulton St -- Inyo St

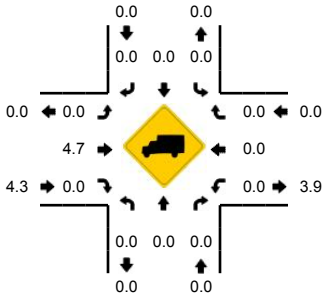
CITY/STATE: Fresno, CA

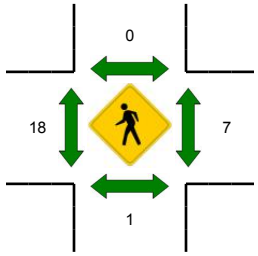
QC JOB #: 10705106

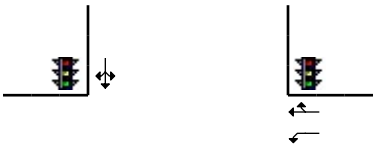
DATE: Thu, Jan 26 2012

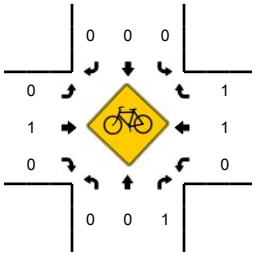
Peak-Hour: 4:45 PM -- 5:45 PM
Peak 15-Min: 5:05 PM -- 5:20 PM

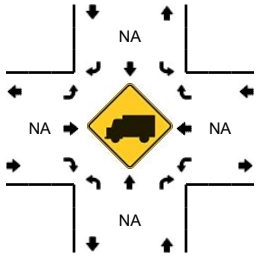


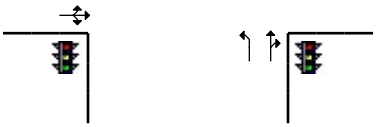


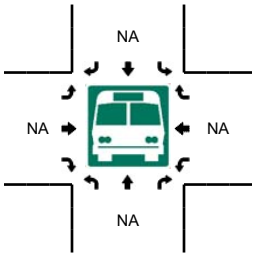












5-Min Count Period Beginning At	Fulton St (Northbound)				Fulton St (Southbound)				Inyo St (Eastbound)				Inyo St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	0	0	0	0	0	9	0	0	1	5	0	0	15	
4:05 PM	0	0	0	0	0	0	0	0	0	6	0	0	0	7	0	0	13	
4:10 PM	0	0	1	0	0	0	0	0	0	8	0	0	2	7	0	0	18	
4:15 PM	0	0	1	0	1	0	0	0	0	1	1	0	3	4	0	0	11	
4:20 PM	1	0	2	0	0	0	0	0	0	2	1	0	1	9	0	0	16	
4:25 PM	0	0	1	0	0	0	0	0	0	3	0	0	2	9	0	0	15	
4:30 PM	0	0	2	0	0	0	0	0	0	2	1	0	1	8	0	1	15	
4:35 PM	0	0	0	0	0	0	0	0	0	5	0	0	1	12	0	0	18	
4:40 PM	0	0	1	0	0	0	0	0	0	6	0	0	0	5	0	0	12	
4:45 PM	1	0	1	0	0	0	0	0	0	5	0	0	0	13	0	0	20	
4:50 PM	0	0	1	0	0	0	0	0	0	5	0	0	0	5	0	0	11	
4:55 PM	0	0	1	0	0	0	0	0	0	4	0	0	0	5	0	0	10	174
5:00 PM	1	0	0	0	0	0	0	0	0	4	0	0	0	8	0	0	13	172
5:05 PM	0	0	0	0	0	0	0	0	0	7	0	0	1	14	0	0	22	181
5:10 PM	1	0	1	0	0	0	0	0	0	4	0	0	2	14	0	0	22	185
5:15 PM	1	0	1	0	0	0	0	0	0	7	1	0	1	14	0	0	25	199
5:20 PM	0	0	1	0	0	0	0	0	0	6	2	0	1	7	0	0	17	200
5:25 PM	1	0	1	0	0	0	0	0	0	4	1	0	2	9	0	0	18	203
5:30 PM	1	0	1	0	0	0	0	0	0	7	0	0	0	8	0	0	17	205
5:35 PM	0	0	1	0	1	0	0	0	0	5	2	0	0	11	0	0	20	207
5:40 PM	0	0	2	0	0	0	1	0	0	6	0	0	1	5	0	0	15	210
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	2	4	0	0	6	196
5:50 PM	0	0	1	0	0	0	0	0	0	3	2	0	0	0	0	0	6	191
5:55 PM	0	0	2	0	0	0	0	0	0	3	0	0	1	2	0	0	8	189

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	8	0	8	0	0	0	0	0	0	72	4	0	16	168	0	0	276
Heavy Trucks	0	0	0		0	0	0		0	4	0		0	0	0		4
Pedestrians		0				0				4				4			8
Bicycles	0	0	1		0	0	0		0	0	0		0	0	0		1
Railroad																	
Stopped Buses																	

Comments:

Report generated on 1/30/2012 5:49 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

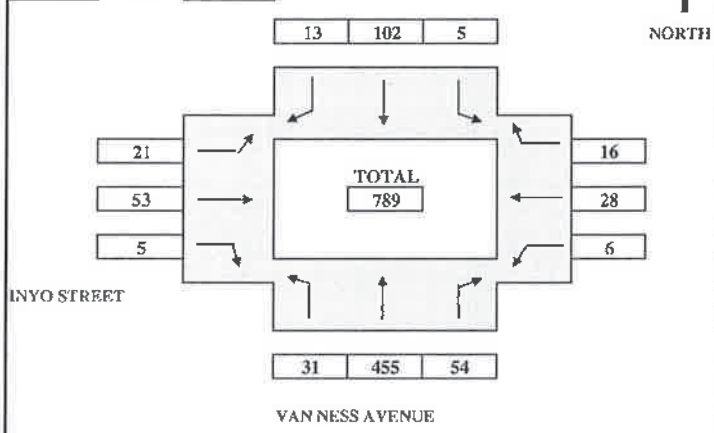
B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

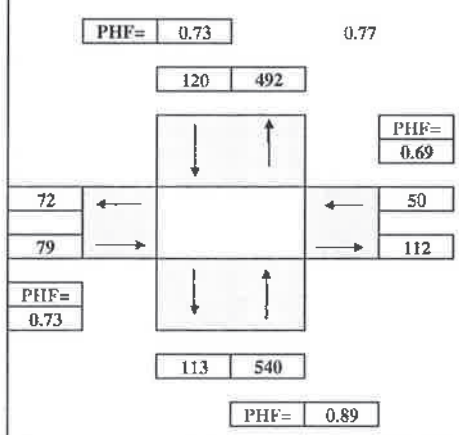
PROJECT:	HST PROJECT	SURVEY DATE:	11/5/2009	DAY:	THURSDAY
N-S APPROACH:	VAN NESS AVENUE	SURVEY TIME:	7:00 AM	TO	9:00 AM
E-W APPROACH:	INYO STREET	CITY:	FRESNO	FILE:	2911072-74AM

PEAK HOUR

07:30 AM TO 08:30 AM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD From		To	NORTHBOUND Left	Thru	Right	SOUTHBOUND Left	Thru	Right	EASTBOUND Left	Thru	Right	WESTBOUND Left	Thru	Right	TOTAL
SURVEY DATA															
7:00 AM	---	7:15 AM	1	55	8	0	9	3	2	8	2	1	7	2	*98*
7:15 AM	---	7:30 AM	9	141	21	3	20	5	6	14	2	3	10	4	*238*
7:30 AM	---	7:45 AM	13	244	34	3	36	8	9	25	3	4	17	8	*404*
7:45 AM	---	8:00 AM	21	370	50	3	58	11	15	45	4	6	27	14	*624*
8:00 AM	---	8:15 AM	31	492	69	6	88	15	21	53	6	8	33	17	*839*
8:15 AM	---	8:30 AM	40	596	75	8	122	18	27	67	7	9	38	20	*1,027*
8:30 AM	---	8:45 AM	44	678	80	10	144	21	32	80	10	10	44	29	*1,182*
8:45 AM	---	9:00 AM	50	759	84	18	174	24	39	86	10	10	50	31	*1,335*
TOTAL BY PERIOD															
7:00 AM	---	7:15 AM	1	55	8	0	9	3	2	8	2	1	7	2	*98*
7:15 AM	---	7:30 AM	8	86	13	3	11	2	4	6	0	2	3	2	*140*
7:30 AM	---	7:45 AM	4	103	13	0	16	3	3	11	1	1	7	4	*166*
7:45 AM	---	8:00 AM	8	126	16	0	22	3	6	20	1	2	10	6	*220*
8:00 AM	---	8:15 AM	10	122	19	3	30	4	6	8	2	2	6	3	*215*
8:15 AM	---	8:30 AM	9	104	6	2	34	3	6	14	1	1	5	3	*188*
8:30 AM	---	8:45 AM	4	82	5	2	22	3	5	13	3	1	6	9	*155*
8:45 AM	---	9:00 AM	6	81	4	8	30	3	7	6	0	0	6	2	*153*
HOURLY TOTALS															
7:00 AM	---	8:00 AM	21	370	50	3	58	11	15	45	4	6	27	14	*624*
7:15 AM	---	8:15 AM	30	437	61	6	79	12	19	45	4	7	26	15	*741*
7:30 AM	---	8:30 AM	31	455	54	5	102	13	21	53	5	6	28	16	*789*
7:45 AM	---	8:45 AM	31	434	46	7	108	13	23	55	7	6	27	21	*778*
8:00 AM	---	9:00 AM	29	389	34	15	116	13	24	41	6	4	23	17	*711*

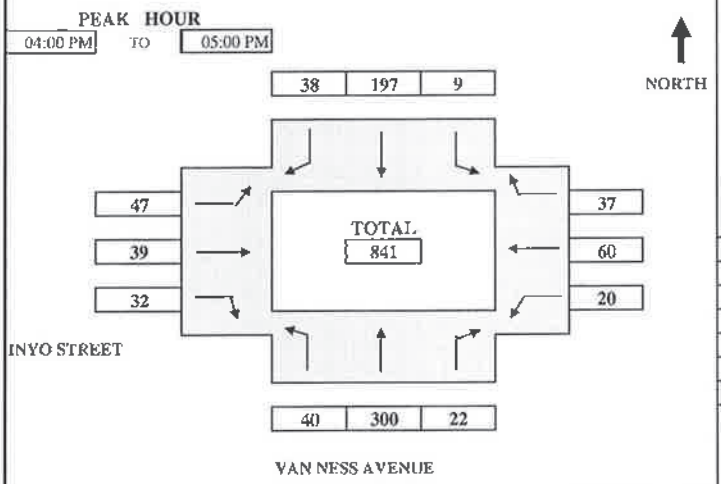
Telephone: (510)232-1271 Fax: (510)232-1272

B.A.Y.M.E.T.R.I.C.S.

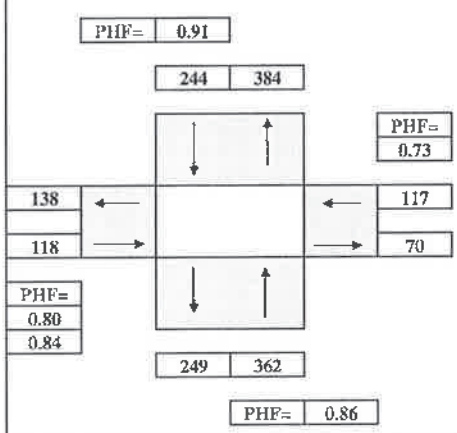
INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT:	HST PROJECT	SURVEY DATE:	11/5/2009	DAY:	THURSDAY
N-S APPROACH:	VAN NESS AVENUE	SURVEY TIME:	4:00 PM	TO	6:00 PM
E-W APPROACH:	INYO STREET	CITY:	FRESNO	FILE:	2911072-74PM

PEAK HOUR
04:00 PM TO 05:00 PM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD From		To	NORTHBOUND Left	Thru	Right	SOUTHBOUND Left	Thru	Right	EASTBOUND Left	Thru	Right	WESTBOUND Left	Thru	Right	TOTAL
SURVEY DATA															
4:00 PM	---	4:15 PM	9	59	4	1	46	15	12	12	11	5	24	11	*209*
4:15 PM	---	4:30 PM	18	146	10	4	96	26	19	17	20	8	38	17	*419*
4:30 PM	---	4:45 PM	32	210	15	5	154	34	35	27	25	18	52	25	*632*
4:45 PM	---	5:00 PM	40	300	22	9	197	38	47	39	32	20	60	37	*841*
5:00 PM	---	5:15 PM	53	383	22	12	243	47	61	48	37	22	74	45	*1,047*
5:15 PM	---	5:30 PM	67	456	22	13	290	53	67	56	54	25	91	53	*1,247*
5:30 PM	---	5:45 PM	84	511	24	17	335	64	77	68	54	26	98	65	*1,423*
5:45 PM	---	6:00 PM	97	569	26	20	359	77	92	79	65	29	102	67	*1,582*
TOTAL BY PERIOD															
4:00 PM	---	4:15 PM	9	59	4	1	46	15	12	12	11	5	24	11	*209*
4:15 PM	---	4:30 PM	9	87	6	3	50	11	7	5	9	3	14	6	*210*
4:30 PM	---	4:45 PM	14	64	5	1	58	8	16	10	5	10	14	8	*213*
4:45 PM	---	5:00 PM	8	90	7	4	43	4	12	12	7	2	8	12	*209*
5:00 PM	---	5:15 PM	13	83	0	3	46	9	14	9	5	2	14	8	*206*
5:15 PM	---	5:30 PM	14	73	0	1	47	6	6	8	17	3	17	8	*200*
5:30 PM	---	5:45 PM	17	55	2	4	45	11	10	12	0	1	7	12	*176*
5:45 PM	---	6:00 PM	13	58	2	3	24	13	15	11	11	3	4	2	*159*
HOURLY TOTALS															
4:00 PM	---	5:00 PM	40	300	22	9	197	38	47	39	32	20	60	37	*841*
4:15 PM	---	5:15 PM	44	324	18	11	197	32	49	36	26	17	50	34	*838*
4:30 PM	---	5:30 PM	49	310	12	9	194	27	48	39	34	17	53	36	*828*
4:45 PM	---	5:45 PM	52	301	9	12	181	30	42	41	29	8	46	40	*791*
5:00 PM	---	6:00 PM	57	269	4	11	162	39	45	40	33	9	42	30	*741*

Telephone: (510)232-1271 Fax: (510)232-1272

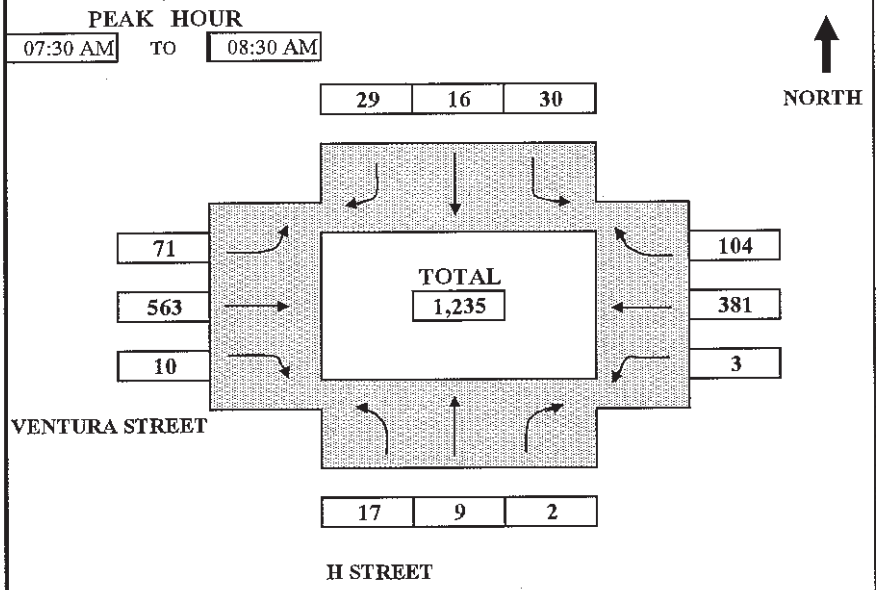
B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

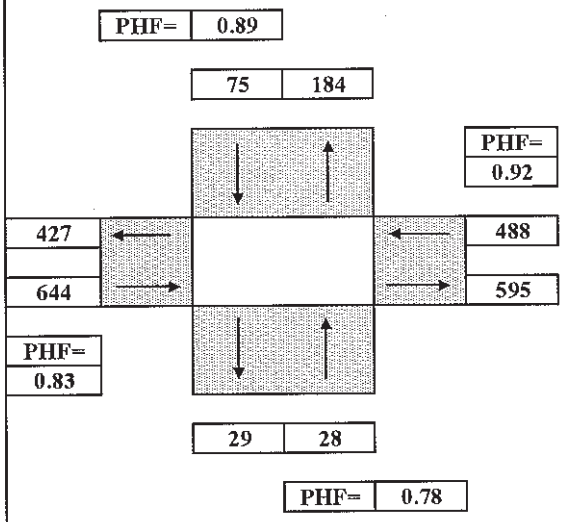
PROJECT:	CALIFORNIA HIGH SPEED TRAIN	SURVEY DATE:	3/10/2011	DAY:	THURSDAY
N-S APPROACH:	H STREET	SURVEY TIME:	7:00 AM	TO	9:00 AM
E-W APPROACH:	VENTURA STREET	JURISDICTION: FRESNO		FILE:	3103016-3AM

PEAK HOUR

07:30 AM TO 08:30 AM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD From		To	NORTHBOUND Left	Thru	Right	SOUTHBOUND Left	Thru	Right	EASTBOUND Left	Thru	Right	WESTBOUND Left	Thru	Right	TOTAL
SURVEY DATA															
7:00 AM	---	7:15 AM	2	1	0	7	5	4	4	81	3	0	68	9	*184*
7:15 AM	---	7:30 AM	5	4	2	13	8	13	23	200	8	1	149	26	*452*
7:30 AM	---	7:45 AM	9	7	2	21	12	20	37	358	9	2	260	47	*784*
7:45 AM	---	8:00 AM	11	9	2	31	18	25	53	532	14	4	345	69	*1,113*
8:00 AM	---	8:15 AM	19	10	2	40	22	32	69	649	17	4	445	94	*1,403*
8:15 AM	---	8:30 AM	22	13	4	43	24	42	94	763	18	4	530	130	*1,687*
8:30 AM	---	8:45 AM	25	18	4	61	28	46	100	854	22	6	601	147	*1,912*
8:45 AM	---	9:00 AM	26	22	5	70	30	56	109	967	25	8	677	162	*2,157*
TOTAL BY PERIOD															
7:00 AM	---	7:15 AM	2	1	0	7	5	4	4	81	3	0	68	9	*184*
7:15 AM	---	7:30 AM	3	3	2	6	3	9	19	119	5	1	81	17	*268*
7:30 AM	---	7:45 AM	4	3	0	8	4	7	14	158	1	1	111	21	*332*
7:45 AM	---	8:00 AM	2	2	0	10	6	5	16	174	5	2	85	22	*329*
8:00 AM	---	8:15 AM	8	1	0	9	4	7	16	117	3	0	100	25	*290*
8:15 AM	---	8:30 AM	3	3	2	3	2	10	25	114	1	0	85	36	*284*
8:30 AM	---	8:45 AM	3	5	0	18	4	4	6	91	4	2	71	17	*225*
8:45 AM	---	9:00 AM	1	4	1	9	2	10	9	113	3	2	76	15	*245*
HOURLY TOTALS															
7:00 AM	---	8:00 AM	11	9	2	31	18	25	53	532	14	4	345	69	*1,113*
7:15 AM	---	8:15 AM	17	9	2	33	17	28	65	568	14	4	377	85	*1,219*
7:30 AM	---	8:30 AM	17	9	2	30	16	29	71	563	10	3	381	104	*1,235*
7:45 AM	---	8:45 AM	16	11	2	40	16	26	63	496	13	4	341	100	*1,128*
8:00 AM	---	9:00 AM	15	13	3	39	12	31	56	435	11	4	332	93	*1,044*

Telephone: (510)232-1271 Fax: (510)232-1272

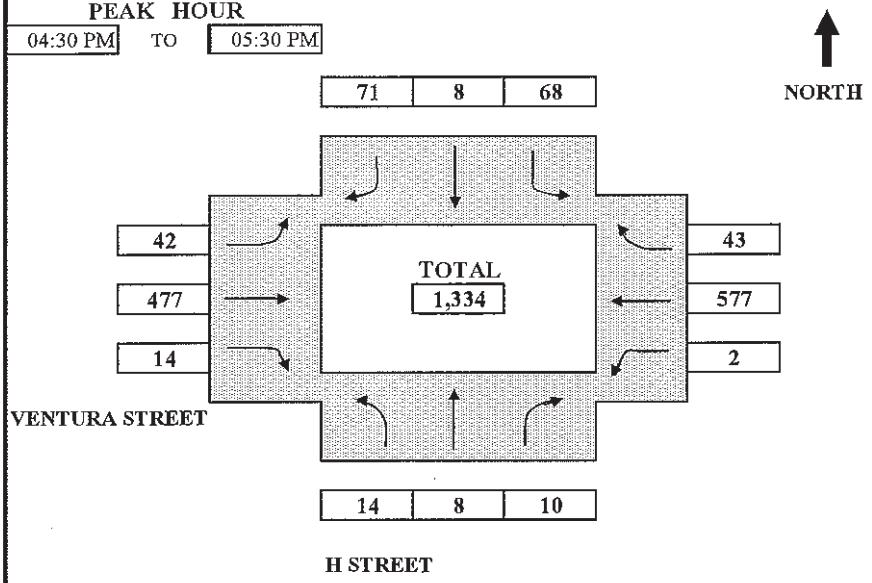
B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

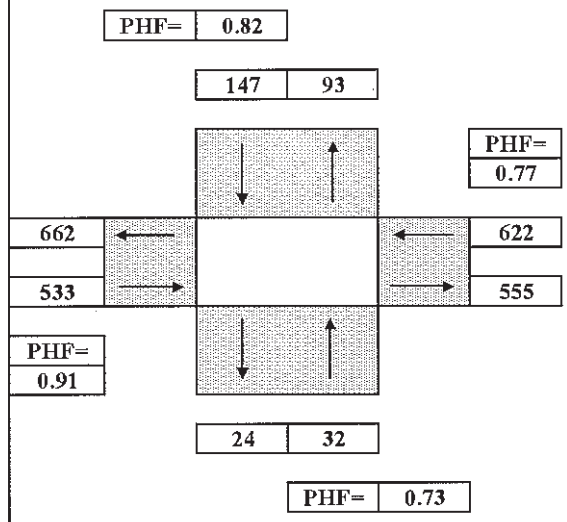
PROJECT:	CALIFORNIA HIGH SPEED TRAIN	SURVEY DATE:	3/10/2011	DAY:	THURSDAY
N-S APPROACH:	H STREET	SURVEY TIME:	4:00 PM	TO	6:00 PM
E-W APPROACH:	VENTURA STREET	JURISDICTION:	FRESNO	FILE:	3103016-3PM

PEAK HOUR

04:30 PM TO 05:30 PM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD From		To	NORTHBOUND Left	Thru	Right	SOUTHBOUND Left	Thru	Right	EASTBOUND Left	Thru	Right	WESTBOUND Left	Thru	Right	TOTAL
SURVEY DATA															
4:00 PM	---	4:15 PM	2	0	3	12	3	19	7	122	5	3	127	11	*314*
4:15 PM	---	4:30 PM	3	3	5	26	5	30	22	239	8	3	213	16	*573*
4:30 PM	---	4:45 PM	6	5	9	39	6	55	30	370	15	3	343	24	*905*
4:45 PM	---	5:00 PM	11	9	11	64	10	71	38	502	18	4	441	32	*1,211*
5:00 PM	---	5:15 PM	14	10	14	79	13	86	51	606	21	5	629	44	*1,572*
5:15 PM	---	5:30 PM	17	11	15	94	13	101	64	716	22	5	790	59	*1,907*
5:30 PM	---	5:45 PM	21	14	16	105	16	118	70	823	24	7	927	66	*2,207*
5:45 PM	---	6:00 PM	24	15	19	124	19	130	76	916	26	7	1,039	72	*2,467*
TOTAL BY PERIOD															
4:00 PM	---	4:15 PM	2	0	3	12	3	19	7	122	5	3	127	11	*314*
4:15 PM	---	4:30 PM	1	3	2	14	2	11	15	117	3	0	86	5	*259*
4:30 PM	---	4:45 PM	3	2	4	13	1	25	8	131	7	0	130	8	*332*
4:45 PM	---	5:00 PM	5	4	2	25	4	16	8	132	3	1	98	8	*306*
5:00 PM	---	5:15 PM	3	1	3	15	3	15	13	104	3	1	188	12	*361*
5:15 PM	---	5:30 PM	3	1	1	15	0	15	13	110	1	0	161	15	*335*
5:30 PM	---	5:45 PM	4	3	1	11	3	17	6	107	2	2	137	7	*300*
5:45 PM	---	6:00 PM	3	1	3	19	3	12	6	93	2	0	112	6	*260*
HOURLY TOTALS															
4:00 PM	---	5:00 PM	11	9	11	64	10	71	38	502	18	4	441	32	*1,211*
4:15 PM	---	5:15 PM	12	10	11	67	10	67	44	484	16	2	502	33	*1,258*
4:30 PM	---	5:30 PM	14	8	10	68	8	71	42	477	14	2	577	43	*1,334*
4:45 PM	---	5:45 PM	15	9	7	66	10	63	40	453	9	4	584	42	*1,302*
5:00 PM	---	6:00 PM	13	6	8	60	9	59	38	414	8	3	598	40	*1,256*

Telephone: (510)232-1271 Fax: (510)232-1272

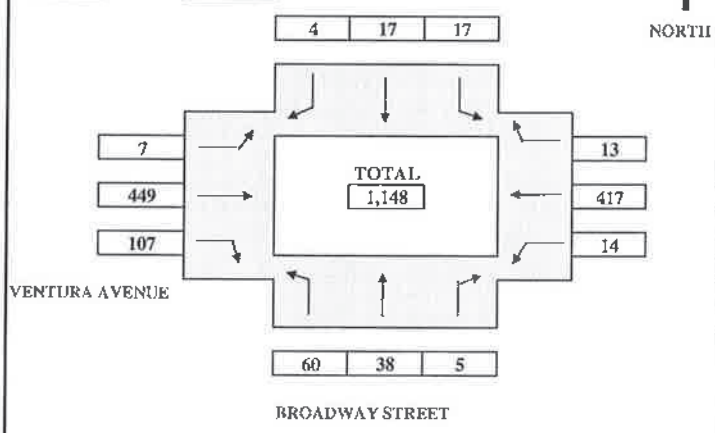
B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

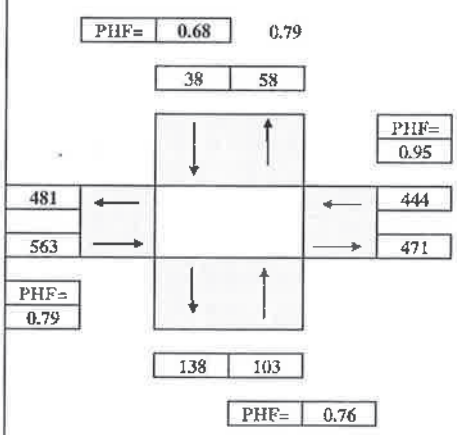
PROJECT:	HST PROJECT	SURVEY DATE:	11/5/2009	DAY:	THURSDAY
N-S APPROACH:	BROADWAY STREET	SURVEY TIME:	7:00 AM	TO	9:00 AM
E-W APPROACH:	VENTURA AVENUE	CITY:	FRESNO	FILE:	2911072-50AM

PEAK HOUR

07:30 AM TO 08:30 AM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD From	To	NORTHBOUND Left	Thru	Right	SOUTHBOUND Left	Thru	Right	EASTBOUND Left	Thru	Right	WESTBOUND Left	Thru	Right	TOTAL
SURVEY DATA														
7:00 AM ---	7:15 AM	5	4	0	1	2	0	0	55	20	2	63	1	*153*
7:15 AM ---	7:30 AM	20	6	1	7	5	0	1	168	50	2	160	4	*424*
7:30 AM ---	7:45 AM	37	13	2	13	9	0	2	290	84	3	268	5	*726*
7:45 AM ---	8:00 AM	54	29	3	20	13	1	4	432	118	5	367	8	*1,054*
8:00 AM ---	8:15 AM	67	37	4	23	15	3	5	510	137	10	472	11	*1,294*
8:15 AM ---	8:30 AM	80	44	6	24	22	4	8	617	157	16	577	17	*1,572*
8:30 AM ---	8:45 AM	84	48	6	29	29	6	12	708	180	19	657	19	*1,797*
8:45 AM ---	9:00 AM	92	51	9	30	39	7	12	810	204	25	735	22	*2,036*
TOTAL BY PERIOD														
7:00 AM ---	7:15 AM	5	4	0	1	2	0	0	55	20	2	63	1	*153*
7:15 AM ---	7:30 AM	15	2	1	6	3	0	1	113	30	0	97	3	*271*
7:30 AM ---	7:45 AM	17	7	1	6	4	0	1	122	34	1	108	1	*302*
7:45 AM ---	8:00 AM	17	16	1	7	4	1	2	142	34	2	99	3	*328*
8:00 AM ---	8:15 AM	13	8	1	3	2	2	1	78	19	5	105	3	*240*
8:15 AM ---	8:30 AM	13	7	2	1	7	1	3	107	20	6	105	6	*278*
8:30 AM ---	8:45 AM	4	4	0	5	7	2	4	91	23	3	80	2	*225*
8:45 AM ---	9:00 AM	8	3	3	1	10	1	0	102	24	6	78	3	*239*
HOURLY TOTALS														
7:00 AM ---	8:00 AM	54	29	3	20	13	1	4	432	118	5	367	8	*1,054*
7:15 AM ---	8:15 AM	62	33	4	22	13	3	5	455	117	8	409	10	*1,141*
7:30 AM ---	8:30 AM	60	38	5	17	17	4	7	449	107	14	417	13	*1,148*
7:45 AM ---	8:45 AM	47	35	4	16	20	6	10	418	96	16	389	14	*1,071*
8:00 AM ---	9:00 AM	38	22	6	10	26	6	8	378	86	20	368	14	*982*

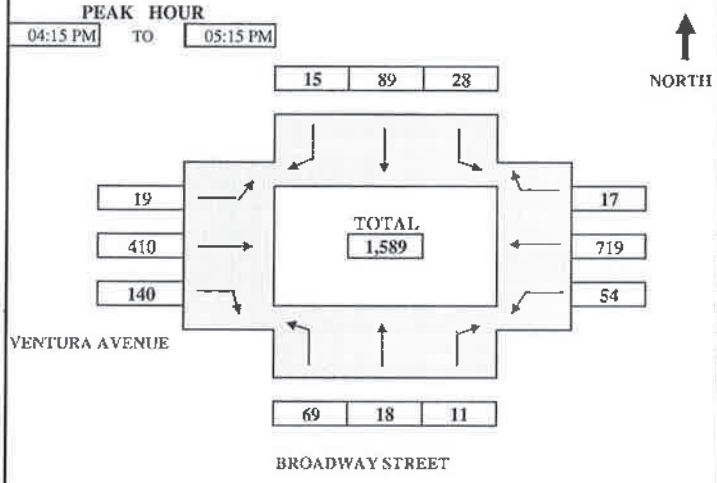
Telephone: (510)232-1271 Fax: (510)232-1272

B.A.Y.M.E.T.R.I.C.S.

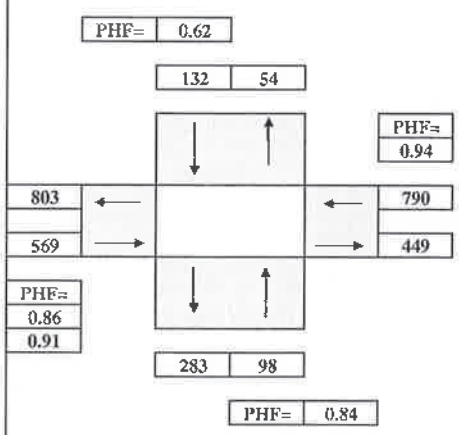
INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT:	HST PROJECT	SURVEY DATE:	11/5/2009	DAY:	THURSDAY
N-S APPROACH:	BROADWAY STREET	SURVEY TIME:	4:00 PM	TO	6:00 PM
E-W APPROACH:	VENTURA AVENUE	CITY:	FRESNO	FILE:	2911072-50PM

PEAK HOUR
04:15 PM TO 05:15 PM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD From		To	NORTHBOUND Left	Thru	Right	SOUTHBOUND Left	Thru	Right	EASTBOUND Left	Thru	Right	WESTBOUND Left	Thru	Right	TOTAL
SURVEY DATA															
4:00 PM	---	4:15 PM	18	3	2	4	26	5	7	128	31	12	140	6	*382*
4:15 PM	---	4:30 PM	33	9	4	10	39	10	10	221	63	24	317	10	*750*
4:30 PM	---	4:45 PM	52	14	9	16	65	13	18	330	101	44	491	13	*1,166*
4:45 PM	---	5:00 PM	66	17	11	22	77	15	23	446	137	52	666	21	*1,553*
5:00 PM	---	5:15 PM	87	21	13	32	115	20	26	538	171	66	859	23	*1,971*
5:15 PM	---	5:30 PM	106	27	14	36	124	21	35	645	205	71	1,012	29	*2,325*
5:30 PM	---	5:45 PM	120	27	15	39	139	24	38	714	240	78	1,150	32	*2,616*
5:45 PM	---	6:00 PM	129	28	15	40	146	30	39	800	275	91	1,281	38	*2,912*
TOTAL BY PERIOD															
4:00 PM	---	4:15 PM	18	3	2	4	26	5	7	128	31	12	140	6	*382*
4:15 PM	---	4:30 PM	15	6	2	6	13	5	3	93	32	12	177	4	*368*
4:30 PM	---	4:45 PM	19	5	5	6	26	3	8	109	38	20	174	3	*416*
4:45 PM	---	5:00 PM	14	3	2	6	12	2	5	116	36	8	175	8	*387*
5:00 PM	---	5:15 PM	21	4	2	10	38	5	3	92	34	14	193	2	*418*
5:15 PM	---	5:30 PM	19	6	1	4	9	1	9	107	34	5	153	6	*354*
5:30 PM	---	5:45 PM	14	0	1	3	15	3	3	69	35	7	138	3	*291*
5:45 PM	---	6:00 PM	9	1	0	1	7	6	1	86	35	13	131	6	*296*
HOURLY TOTALS															
4:00 PM	---	5:00 PM	66	17	11	22	77	15	23	446	137	52	666	21	*1,553*
4:15 PM	---	5:15 PM	69	18	11	28	89	15	19	410	140	54	719	17	*1,589*
4:30 PM	---	5:30 PM	73	18	10	26	85	11	25	424	142	47	695	19	*1,575*
4:45 PM	---	5:45 PM	68	13	6	23	74	11	20	384	139	34	659	19	*1,450*
5:00 PM	---	6:00 PM	63	11	4	18	69	15	16	354	138	39	615	17	*1,359*

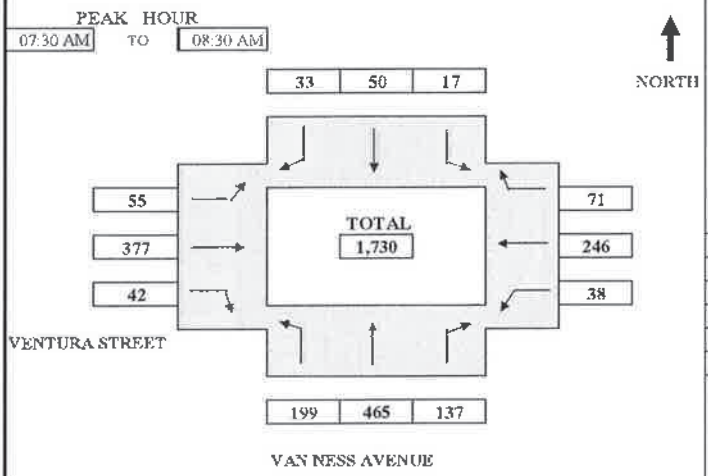
Telephone: (510)232-1271 Fax: (510)232-1272

B.A.Y.M.E.T.R.I.C.S.

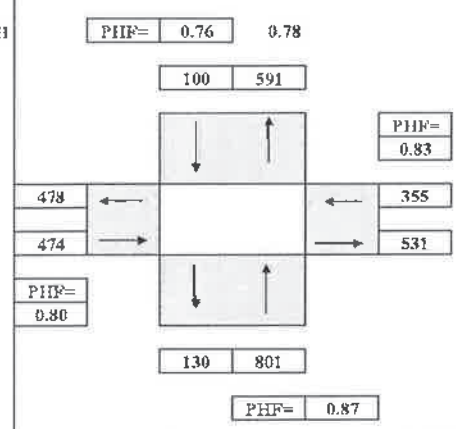
INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT:	HST PROJECT	SURVEY DATE:	11/5/2009	DAY:	THURSDAY
N-S APPROACH:	VAN NESS AVENUE	SURVEY TIME:	7:00 AM	TO	9:00 AM
E-W APPROACH:	VENTURA STREET	CITY:	FRESNO	FILE:	2911072-17AM

PEAK HOUR
07:30 AM TO 08:30 AM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD From	To	NORTHBOUND Left	Thru	Right	SOUTHBOUND Left	Thru	Right	EASTBOUND Left	Thru	Right	WESTBOUND Left	Thru	Right	TOTAL
SURVEY DATA														
7:00 AM ---	7:15 AM	20	73	22	1	10	2	5	47	5	5	44	8	*242*
7:15 AM ---	7:30 AM	73	165	60	5	14	5	15	136	17	8	96	21	*615*
7:30 AM ---	7:45 AM	118	272	87	6	26	10	34	235	28	19	166	34	*1,035*
7:45 AM ---	8:00 AM	171	412	124	10	39	14	50	354	42	26	219	48	*1,509*
8:00 AM ---	8:15 AM	219	540	164	17	49	29	64	429	47	39	287	74	*1,958*
8:15 AM ---	8:30 AM	272	630	197	22	64	38	70	513	59	46	342	92	*2,345*
8:30 AM ---	8:45 AM	306	701	212	30	84	43	77	595	63	50	392	113	*2,666*
8:45 AM ---	9:00 AM	333	773	237	37	96	47	86	670	74	60	449	129	*2,991*
TOTAL BY PERIOD														
7:00 AM ---	7:15 AM	20	73	22	1	10	2	5	47	5	5	44	8	*242*
7:15 AM ---	7:30 AM	53	92	38	4	4	3	10	89	12	3	52	13	*373*
7:30 AM ---	7:45 AM	45	107	27	1	12	5	19	99	11	11	70	13	*420*
7:45 AM ---	8:00 AM	53	140	37	4	13	4	16	119	14	7	53	14	*474*
8:00 AM ---	8:15 AM	48	128	40	7	10	15	14	75	5	13	68	26	*449*
8:15 AM ---	8:30 AM	53	90	33	5	15	9	6	84	12	7	55	18	*387*
8:30 AM ---	8:45 AM	34	71	15	8	20	5	7	82	4	4	50	21	*321*
8:45 AM ---	9:00 AM	27	72	25	7	12	4	9	75	11	10	57	16	*325*
HOURLY TOTALS														
7:00 AM ---	8:00 AM	171	412	124	10	39	14	50	354	42	26	219	48	*1,509*
7:15 AM ---	8:15 AM	199	467	142	16	39	27	59	382	42	34	243	66	*1,716*
7:30 AM ---	8:30 AM	199	465	137	17	50	33	55	377	42	38	246	71	*1,730*
7:45 AM ---	8:45 AM	188	429	125	24	58	33	43	360	35	31	226	79	*1,631*
8:00 AM ---	9:00 AM	162	361	113	27	57	33	36	316	32	34	230	81	*1,482*

Telephone: (510)232-1271 Fax: (510)232-1272

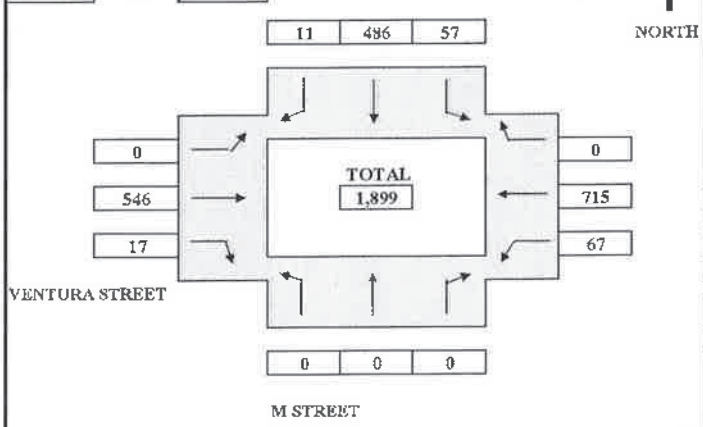
B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

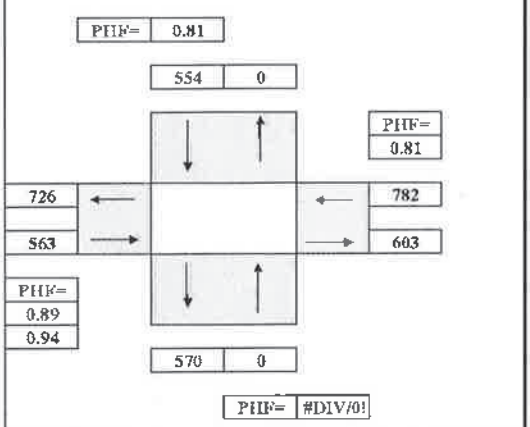
PROJECT:	HST PROJECT	SURVEY DATE:	11/5/2009	DAY:	THURSDAY
N-S APPROACH:	M STREET	SURVEY TIME:	4:00 PM	TO	6:00 PM
E-W APPROACH:	VENTURA STREET	CITY:	FRESNO	FILE:	2911072-21PM

PEAK HOUR

04:15 PM TO 05:15 PM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD From		To	NORTHBOUND Left	Thru	Right	SOUTHBOUND Left	Thru	Right	EASTBOUND Left	Thru	Right	WESTBOUND Left	Thru	Right	TOTAL
SURVEY DATA															
4:00 PM	---	4:15 PM	0	0	0	16	135	4	0	142	16	30	169	0	*512*
4:15 PM	---	4:30 PM	0	0	0	27	197	7	0	269	23	43	328	0	*894*
4:30 PM	---	4:45 PM	0	0	0	50	340	11	0	396	27	68	497	0	*1,389*
4:45 PM	---	5:00 PM	0	0	0	58	466	13	0	540	31	80	660	0	*1,848*
5:00 PM	---	5:15 PM	0	0	0	73	621	15	0	688	33	97	884	0	*2,411*
5:15 PM	---	5:30 PM	0	0	0	88	709	21	0	785	34	114	998	0	*2,749*
5:30 PM	---	5:45 PM	0	0	0	97	787	22	0	882	41	141	1,159	0	*3,129*
5:45 PM	---	6:00 PM	0	0	0	100	838	29	0	977	43	156	1,288	0	*3,431*
TOTAL BY PERIOD															
4:00 PM	---	4:15 PM	0	0	0	16	135	4	0	142	16	30	169	0	*512*
4:15 PM	---	4:30 PM	0	0	0	11	62	3	0	127	7	13	159	0	*382*
4:30 PM	---	4:45 PM	0	0	0	23	143	4	0	127	4	25	169	0	*495*
4:45 PM	---	5:00 PM	0	0	0	8	126	2	0	144	4	12	163	0	*459*
5:00 PM	---	5:15 PM	0	0	0	15	155	2	0	148	2	17	224	0	*563*
5:15 PM	---	5:30 PM	0	0	0	15	88	6	0	97	1	17	114	0	*338*
5:30 PM	---	5:45 PM	0	0	0	9	78	1	0	97	7	27	161	0	*380*
5:45 PM	---	6:00 PM	0	0	0	3	51	7	0	95	2	15	129	0	*302*
HOURLY TOTALS															
4:00 PM	---	5:00 PM	0	0	0	58	466	13	0	540	31	80	660	0	*1,848*
4:15 PM	---	5:15 PM	0	0	0	57	486	11	0	546	17	67	715	0	*1,899*
4:30 PM	---	5:30 PM	0	0	0	61	512	14	0	516	11	71	670	0	*1,855*
4:45 PM	---	5:45 PM	0	0	0	47	447	11	0	486	14	73	662	0	*1,740*
5:00 PM	---	6:00 PM	0	0	0	42	372	16	0	437	12	76	628	0	*1,583*

Telephone: (510)232-1271 Fax: (510)232-1272

Data File: 'Broadway_NO_Stanislaus_NB_031809.rdf'
Site Code: '800000000008'
Start Date: 3/19/2009
Start Time: 12:00 AM
Sensor Layout: '11'

'LOCATION': 'Broadway'
'CROSS ST': 'N/O Stanislaus'
'COUNT': 'Downtown Study'

Date	Time	NB	Date	Time	NB	Date	Time	NB	Date	Time	NB
3/19/2009	12:00 AM	14	3/20/2009	12:00 AM	11	3/21/2009	12:00 AM	20	3/22/2009	12:00 AM	16
3/19/2009	1:00 AM	8	3/20/2009	1:00 AM	10	3/21/2009	1:00 AM	10	3/22/2009	1:00 AM	10
3/19/2009	2:00 AM	1	3/20/2009	2:00 AM	0	3/21/2009	2:00 AM	6	3/22/2009	2:00 AM	4
3/19/2009	3:00 AM	0	3/20/2009	3:00 AM	1	3/21/2009	3:00 AM	3	3/22/2009	3:00 AM	2
3/19/2009	4:00 AM	1	3/20/2009	4:00 AM	2	3/21/2009	4:00 AM	0	3/22/2009	4:00 AM	0
3/19/2009	5:00 AM	13	3/20/2009	5:00 AM	12	3/21/2009	5:00 AM	6	3/22/2009	5:00 AM	1
3/19/2009	6:00 AM	18	3/20/2009	6:00 AM	19	3/21/2009	6:00 AM	6	3/22/2009	6:00 AM	4
3/19/2009	7:00 AM	32	3/20/2009	7:00 AM	34	3/21/2009	7:00 AM	19	3/22/2009	7:00 AM	10
3/19/2009	8:00 AM	47	3/20/2009	8:00 AM	34	3/21/2009	8:00 AM	17	3/22/2009	8:00 AM	14
3/19/2009	9:00 AM	50	3/20/2009	9:00 AM	44	3/21/2009	9:00 AM	28	3/22/2009	9:00 AM	32
3/19/2009	10:00 AM	39	3/20/2009	10:00 AM	55	3/21/2009	10:00 AM	58	3/22/2009	10:00 AM	104
3/19/2009	11:00 AM	52	3/20/2009	11:00 AM	62	3/21/2009	11:00 AM	46	3/22/2009	11:00 AM	60
3/19/2009	12:00 PM	62	3/20/2009	12:00 PM	75	3/21/2009	12:00 PM	41	3/22/2009	12:00 PM	125
3/19/2009	1:00 PM	54	3/20/2009	1:00 PM	55	3/21/2009	1:00 PM	23	3/22/2009	1:00 PM	18
3/19/2009	2:00 PM	57	3/20/2009	2:00 PM	70	3/21/2009	2:00 PM	20	3/22/2009	2:00 PM	23
3/19/2009	3:00 PM	73	3/20/2009	3:00 PM	71	3/21/2009	3:00 PM	37	3/22/2009	3:00 PM	11
3/19/2009	4:00 PM	71	3/20/2009	4:00 PM	88	3/21/2009	4:00 PM	30	3/22/2009	4:00 PM	9
3/19/2009	5:00 PM	73	3/20/2009	5:00 PM	56	3/21/2009	5:00 PM	22	3/22/2009	5:00 PM	15
3/19/2009	6:00 PM	28	3/20/2009	6:00 PM	30	3/21/2009	6:00 PM	24	3/22/2009	6:00 PM	17
3/19/2009	7:00 PM	21	3/20/2009	7:00 PM	27	3/21/2009	7:00 PM	33	3/22/2009	7:00 PM	13
3/19/2009	8:00 PM	15	3/20/2009	8:00 PM	52	3/21/2009	8:00 PM	71	3/22/2009	8:00 PM	11
3/19/2009	9:00 PM	15	3/20/2009	9:00 PM	90	3/21/2009	9:00 PM	89	3/22/2009	9:00 PM	14
3/19/2009	10:00 PM	14	3/20/2009	10:00 PM	48	3/21/2009	10:00 PM	38	3/22/2009	10:00 PM	2
3/19/2009	11:00 PM	7	3/20/2009	11:00 PM	26	3/21/2009	11:00 PM	17	3/22/2009	11:00 PM	2
		765			972			664			517

Data File: 'Broadway_NO_Stanislaus_SB_031809.rdf'
Site Code: '000000000009'
Start Date: 3/19/2009
Start Time: 12:00 AM
Sensor Layout: '11'

'LOCATION': 'Broadway'
'CROSS ST': 'N/O Stanislaus'
'COUNT': 'Downtown Study'

Thursday			Friday			Saturday			Sunday		
Date	Time	SB									
3/19/2009	12:00 AM	4	3/20/2009	12:00 AM	12	3/21/2009	12:00 AM	56	3/22/2009	12:00 AM	51
3/19/2009	1:00 AM	2	3/20/2009	1:00 AM	10	3/21/2009	1:00 AM	74	3/22/2009	1:00 AM	106
3/19/2009	2:00 AM	3	3/20/2009	2:00 AM	2	3/21/2009	2:00 AM	7	3/22/2009	2:00 AM	20
3/19/2009	3:00 AM	3	3/20/2009	3:00 AM	2	3/21/2009	3:00 AM	1	3/22/2009	3:00 AM	1
3/19/2009	4:00 AM	10	3/20/2009	4:00 AM	11	3/21/2009	4:00 AM	3	3/22/2009	4:00 AM	3
3/19/2009	5:00 AM	46	3/20/2009	5:00 AM	40	3/21/2009	5:00 AM	32	3/22/2009	5:00 AM	3
3/19/2009	6:00 AM	55	3/20/2009	6:00 AM	50	3/21/2009	6:00 AM	21	3/22/2009	6:00 AM	7
3/19/2009	7:00 AM	154	3/20/2009	7:00 AM	158	3/21/2009	7:00 AM	32	3/22/2009	7:00 AM	20
3/19/2009	8:00 AM	141	3/20/2009	8:00 AM	117	3/21/2009	8:00 AM	58	3/22/2009	8:00 AM	26
3/19/2009	9:00 AM	105	3/20/2009	9:00 AM	104	3/21/2009	9:00 AM	64	3/22/2009	9:00 AM	43
3/19/2009	10:00 AM	92	3/20/2009	10:00 AM	92	3/21/2009	10:00 AM	69	3/22/2009	10:00 AM	53
3/19/2009	11:00 AM	107	3/20/2009	11:00 AM	120	3/21/2009	11:00 AM	87	3/22/2009	11:00 AM	44
3/19/2009	12:00 PM	145	3/20/2009	12:00 PM	88	3/21/2009	12:00 PM	67	3/22/2009	12:00 PM	65
3/19/2009	1:00 PM	117	3/20/2009	1:00 PM	109	3/21/2009	1:00 PM	57	3/22/2009	1:00 PM	49
3/19/2009	2:00 PM	143	3/20/2009	2:00 PM	160	3/21/2009	2:00 PM	38	3/22/2009	2:00 PM	41
3/19/2009	3:00 PM	136	3/20/2009	3:00 PM	125	3/21/2009	3:00 PM	41	3/22/2009	3:00 PM	51
3/19/2009	4:00 PM	120	3/20/2009	4:00 PM	131	3/21/2009	4:00 PM	43	3/22/2009	4:00 PM	31
3/19/2009	5:00 PM	76	3/20/2009	5:00 PM	115	3/21/2009	5:00 PM	28	3/22/2009	5:00 PM	24
3/19/2009	6:00 PM	52	3/20/2009	6:00 PM	58	3/21/2009	6:00 PM	36	3/22/2009	6:00 PM	32
3/19/2009	7:00 PM	40	3/20/2009	7:00 PM	58	3/21/2009	7:00 PM	32	3/22/2009	7:00 PM	20
3/19/2009	8:00 PM	27	3/20/2009	8:00 PM	52	3/21/2009	8:00 PM	37	3/22/2009	8:00 PM	14
3/19/2009	9:00 PM	34	3/20/2009	9:00 PM	57	3/21/2009	9:00 PM	31	3/22/2009	9:00 PM	10
3/19/2009	10:00 PM	13	3/20/2009	10:00 PM	42	3/21/2009	10:00 PM	20	3/22/2009	10:00 PM	8
3/19/2009	11:00 PM	15	3/20/2009	11:00 PM	56	3/21/2009	11:00 PM	41	3/22/2009	11:00 PM	10
		1,640			1,769			975			732

Data File: 'Fulton_NO_Stanislaus_031809.rdf'
Site Code: '000000000000'
Start Date: 3/19/2009
Start Time: 12:00 AM
Sensor Layout: '31'

'LOCATION': 'Fulton'
'CROSS ST': 'N/O Stanislaus'
'COUNT': 'Downtown Study'

Thursday					Friday					Saturday					Sunday				
Date	Time	Total	**SB**	**NB**	Date	Time	Total	**SB**	**NB**	Date	Time	Total	**SB**	**NB**	Date	Time	Total	**SB**	**NB**
3/19/2009	12:00 AM	3	3	0	3/20/2009	12:00 AM	4	4	0	3/21/2009	12:00 AM	35	32	3	3/22/2009	12:00 AM	23	20	3
3/19/2009	1:00 AM	4	3	1	3/20/2009	1:00 AM	7	5	2	3/21/2009	1:00 AM	23	21	2	3/22/2009	1:00 AM	32	27	5
3/19/2009	2:00 AM	5	5	0	3/20/2009	2:00 AM	8	6	2	3/21/2009	2:00 AM	7	3	4	3/22/2009	2:00 AM	10	8	2
3/19/2009	3:00 AM	5	5	0	3/20/2009	3:00 AM	6	6	0	3/21/2009	3:00 AM	7	6	1	3/22/2009	3:00 AM	4	4	0
3/19/2009	4:00 AM	41	41	0	3/20/2009	4:00 AM	28	28	0	3/21/2009	4:00 AM	5	4	1	3/22/2009	4:00 AM	3	2	1
3/19/2009	5:00 AM	63	59	4	3/20/2009	5:00 AM	64	60	4	3/21/2009	5:00 AM	41	38	3	3/22/2009	5:00 AM	2	1	1
3/19/2009	6:00 AM	88	82	6	3/20/2009	6:00 AM	62	59	3	3/21/2009	6:00 AM	31	20	11	3/22/2009	6:00 AM	28	24	4
3/19/2009	7:00 AM	242	221	21	3/20/2009	7:00 AM	188	173	15	3/21/2009	7:00 AM	42	32	10	3/22/2009	7:00 AM	53	43	10
3/19/2009	8:00 AM	270	225	45	3/20/2009	8:00 AM	218	184	34	3/21/2009	8:00 AM	80	57	23	3/22/2009	8:00 AM	96	79	17
3/19/2009	9:00 AM	174	141	33	3/20/2009	9:00 AM	169	144	25	3/21/2009	9:00 AM	124	89	35	3/22/2009	9:00 AM	64	52	12
3/19/2009	10:00 AM	187	147	40	3/20/2009	10:00 AM	185	153	32	3/21/2009	10:00 AM	158	120	38	3/22/2009	10:00 AM	136	103	33
3/19/2009	11:00 AM	222	173	49	3/20/2009	11:00 AM	210	182	28	3/21/2009	11:00 AM	147	106	41	3/22/2009	11:00 AM	122	79	43
3/19/2009	12:00 PM	238	200	38	3/20/2009	12:00 PM	208	174	34	3/21/2009	12:00 PM	130	90	40	3/22/2009	12:00 PM	161	108	53
3/19/2009	1:00 PM	246	214	32	3/20/2009	1:00 PM	220	191	29	3/21/2009	1:00 PM	100	69	31	3/22/2009	1:00 PM	101	74	27
3/19/2009	2:00 PM	185	150	35	3/20/2009	2:00 PM	214	191	23	3/21/2009	2:00 PM	100	76	24	3/22/2009	2:00 PM	81	65	16
3/19/2009	3:00 PM	194	161	33	3/20/2009	3:00 PM	198	175	23	3/21/2009	3:00 PM	151	136	15	3/22/2009	3:00 PM	71	63	8
3/19/2009	4:00 PM	148	122	26	3/20/2009	4:00 PM	185	153	32	3/21/2009	4:00 PM	95	83	12	3/22/2009	4:00 PM	57	45	12
3/19/2009	5:00 PM	143	115	28	3/20/2009	5:00 PM	133	116	17	3/21/2009	5:00 PM	70	61	9	3/22/2009	5:00 PM	68	61	7
3/19/2009	6:00 PM	95	75	20	3/20/2009	6:00 PM	108	86	22	3/21/2009	6:00 PM	84	59	25	3/22/2009	6:00 PM	63	43	20
3/19/2009	7:00 PM	47	39	8	3/20/2009	7:00 PM	71	58	13	3/21/2009	7:00 PM	65	54	11	3/22/2009	7:00 PM	49	37	12
3/19/2009	8:00 PM	46	38	8	3/20/2009	8:00 PM	66	59	7	3/21/2009	8:00 PM	59	42	17	3/22/2009	8:00 PM	25	21	4
3/19/2009	9:00 PM	43	30	13	3/20/2009	9:00 PM	75	50	25	3/21/2009	9:00 PM	70	46	24	3/22/2009	9:00 PM	44	27	17
3/19/2009	10:00 PM	23	19	4	3/20/2009	10:00 PM	43	28	15	3/21/2009	10:00 PM	50	40	10	3/22/2009	10:00 PM	8	8	0
3/19/2009	11:00 PM	9	9	0	3/20/2009	11:00 PM	44	37	7	3/21/2009	11:00 PM	32	25	7	3/22/2009	11:00 PM	7	5	2
		2,721	**2,277**	**444**			2,714	**2,322**	**392**			1,706	**1,309**	**397**			1,308	**999**	**309**

Data File: 'VanNess_NO_Stanislaus_031809.rdf'
Site Code: '000000000000'
Start Date: 3/19/2009
Start Time: 12:00 AM
Sensor Layout: '21'

'LOCATION': 'Van Ness'
'CROSS ST': 'N/O Stanislaus'
'COUNT': 'Downtown Study'

Thursday					Friday					Saturday					Sunday				
Date	Time	Total	**NB**	**SB**	Date	Time	Total	**NB**	**SB**	Date	Time	Total	**NB**	**SB**	Date	Time	Total	**NB**	**SB**
3/19/2009	12:00 AM	57	47	10	3/20/2009	12:00 AM	51	42	9	3/21/2009	12:00 AM	82	67	15	3/22/2009	12:00 AM	63	51	12
3/19/2009	1:00 AM	53	43	10	3/20/2009	1:00 AM	52	45	7	3/21/2009	1:00 AM	68	53	15	3/22/2009	1:00 AM	58	45	13
3/19/2009	2:00 AM	14	9	5	3/20/2009	2:00 AM	17	13	4	3/21/2009	2:00 AM	29	21	8	3/22/2009	2:00 AM	32	25	7
3/19/2009	3:00 AM	21	14	7	3/20/2009	3:00 AM	17	12	5	3/21/2009	3:00 AM	18	13	5	3/22/2009	3:00 AM	17	13	4
3/19/2009	4:00 AM	12	10	2	3/20/2009	4:00 AM	15	12	3	3/21/2009	4:00 AM	20	15	5	3/22/2009	4:00 AM	9	5	4
3/19/2009	5:00 AM	43	30	13	3/20/2009	5:00 AM	39	29	10	3/21/2009	5:00 AM	19	14	5	3/22/2009	5:00 AM	12	8	4
3/19/2009	6:00 AM	76	46	30	3/20/2009	6:00 AM	89	61	28	3/21/2009	6:00 AM	48	34	14	3/22/2009	6:00 AM	19	13	6
3/19/2009	7:00 AM	252	133	119	3/20/2009	7:00 AM	216	114	102	3/21/2009	7:00 AM	83	49	34	3/22/2009	7:00 AM	52	38	14
3/19/2009	8:00 AM	338	199	139	3/20/2009	8:00 AM	344	198	146	3/21/2009	8:00 AM	147	93	54	3/22/2009	8:00 AM	73	50	23
3/19/2009	9:00 AM	337	233	104	3/20/2009	9:00 AM	374	256	118	3/21/2009	9:00 AM	217	133	84	3/22/2009	9:00 AM	87	62	25
3/19/2009	10:00 AM	408	289	119	3/20/2009	10:00 AM	399	269	130	3/21/2009	10:00 AM	258	186	72	3/22/2009	10:00 AM	123	79	44
3/19/2009	11:00 AM	533	384	149	3/20/2009	11:00 AM	529	379	150	3/21/2009	11:00 AM	306	217	89	3/22/2009	11:00 AM	176	126	50
3/19/2009	12:00 PM	488	358	130	3/20/2009	12:00 PM	512	375	137	3/21/2009	12:00 PM	285	223	62	3/22/2009	12:00 PM	218	160	58
3/19/2009	1:00 PM	551	379	172	3/20/2009	1:00 PM	608	459	149	3/21/2009	1:00 PM	277	199	78	3/22/2009	1:00 PM	264	199	65
3/19/2009	2:00 PM	513	397	116	3/20/2009	2:00 PM	524	370	154	3/21/2009	2:00 PM	289	211	78	3/22/2009	2:00 PM	255	179	76
3/19/2009	3:00 PM	528	408	120	3/20/2009	3:00 PM	548	399	149	3/21/2009	3:00 PM	246	180	66	3/22/2009	3:00 PM	195	141	54
3/19/2009	4:00 PM	535	437	98	3/20/2009	4:00 PM	580	472	108	3/21/2009	4:00 PM	260	188	72	3/22/2009	4:00 PM	185	134	51
3/19/2009	5:00 PM	525	458	67	3/20/2009	5:00 PM	542	440	102	3/21/2009	5:00 PM	167	124	43	3/22/2009	5:00 PM	132	102	30
3/19/2009	6:00 PM	289	214	75	3/20/2009	6:00 PM	255	193	62	3/21/2009	6:00 PM	208	105	103	3/22/2009	6:00 PM	140	110	30
3/19/2009	7:00 PM	187	144	43	3/20/2009	7:00 PM	209	167	42	3/21/2009	7:00 PM	146	111	35	3/22/2009	7:00 PM	91	62	29
3/19/2009	8:00 PM	127	92	35	3/20/2009	8:00 PM	204	154	50	3/21/2009	8:00 PM	111	91	20	3/22/2009	8:00 PM	97	74	23
3/19/2009	9:00 PM	106	85	21	3/20/2009	9:00 PM	158	129	29	3/21/2009	9:00 PM	147	123	24	3/22/2009	9:00 PM	53	39	14
3/19/2009	10:00 PM	59	43	16	3/20/2009	10:00 PM	139	102	37	3/21/2009	10:00 PM	175	141	34	3/22/2009	10:00 PM	56	41	15
3/19/2009	11:00 PM	73	44	29	3/20/2009	11:00 PM	100	76	24	3/21/2009	11:00 PM	111	79	32	3/22/2009	11:00 PM	48	30	18
		6,125	**4,496**	**1,629**			6,521	**4,766**	**1,755**			3,717	**2,670**	**1,047**			2,455	**1,786**	**669**

B A Y M E T R I C S

HST PROJECT - FRESNO

Date	15-Nov-09 Sunday				16-Nov-09 Monday				17-Nov-09 Tuesday				18-Nov-09 Wednesday				19-Nov-09 Thursday				20-Nov-09 Friday				21-Nov-09 Saturday			
Location	19. On Van Ness Avenue, between Fresno Street and Tulare Street																											
Direction	NB		SB		NB		SB		NB		SB		NB		SB		NB		SB		NB		SB		NB		SB	
TIME	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN
1200	15	0	14	0	8	0	4	0	6	0	5	0	3	0	8	0	4	0	5	0	13	0	3	0	15	0	7	0
1215	12	0	8	0	5	0	7	0	12	0	7	0	15	0	3	0	8	0	6	0	10	0	3	0	14	0	5	0
1230	8	0	13	0	6	0	11	0	13	0	1	0	15	0	4	0	24	0	4	0	16	0	2	0	16	0	6	0
1245	17	52	20	55	3	22	5	27	33	64	2	15	30	63	5	20	18	54	4	19	24	63	0	8	26	71	3	21
100	9	46	12	53	4	18	4	27	5	63	4	14	1	61	5	17	17	67	4	18	8	58	2	7	9	65	2	16
115	8	42	19	64	2	15	2	22	6	57	3	10	4	50	3	17	5	64	1	13	3	51	1	5	7	58	2	13
130	10	44	44	95	4	13	5	16	4	48	5	14	6	41	6	19	4	44	5	14	5	40	5	8	8	50	5	12
145	5	32	36	111	3	13	1	12	2	17	6	18	2	13	5	19	2	28	2	12	5	21	1	9	9	33	3	12
200	4	27	9	108	3	12	4	12	4	16	7	21	5	17	3	17	4	15	5	13	3	16	7	14	5	29	4	14
215	2	21	5	94	4	14	6	16	1	11	4	22	7	20	4	18	6	16	2	14	2	15	1	14	3	25	5	17
230	8	19	12	62	3	13	4	15	4	11	3	20	2	16	4	16	1	13	3	12	3	13	9	18	4	21	9	21
245	8	22	12	38	3	13	4	18	1	10	3	17	4	18	4	15	5	16	7	17	3	11	7	24	7	19	9	27
300	6	24	8	37	2	12	3	17	7	13	3	13	1	14	3	15	2	14	13	25	6	14	10	27	5	19	9	32
315	6	28	7	39	0	8	1	12	2	14	2	11	2	9	6	17	4	12	5	28	0	12	15	41	2	18	6	33
330	3	23	3	30	3	8	4	12	2	12	6	14	0	7	11	24	2	13	6	31	4	13	9	41	1	15	9	33
345	4	19	6	24	7	12	4	12	2	13	10	21	3	6	5	25	2	10	19	43	4	14	13	47	5	13	9	33
400	6	19	4	20	2	12	3	12	3	9	5	23	6	11	9	31	4	12	14	44	0	8	16	53	7	15	11	35
415	2	15	6	19	3	15	4	15	2	9	1	22	2	11	13	38	1	9	17	56	2	10	24	62	1	14	11	40
430	1	13	2	18	4	16	4	15	7	14	9	25	7	18	14	41	3	10	16	66	4	10	29	82	3	16	18	49
445	2	11	1	13	5	14	8	19	9	21	17	32	8	23	14	50	15	23	22	69	7	13	36	105	4	15	27	67
500	2	7	5	14	11	23	6	22	6	24	7	34	8	25	16	57	9	28	26	81	6	19	46	135	3	11	22	78
515	3	8	5	13	4	24	13	31	5	27	14	47	10	33	20	64	7	34	37	101	5	22	58	169	9	19	47	114
530	4	11	1	12	15	35	9	36	12	32	21	59	12	38	26	76	19	50	57	142	13	31	81	221	7	23	32	128
545	6	15	6	17	14	44	12	40	20	43	23	65	15	45	39	101	18	53	72	192	16	40	59	244	9	28	26	127
600	11	24	9	21	25	58	24	58	26	63	26	84	19	56	53	138	27	71	69	235	24	58	69	267	13	38	37	142
615	4	25	6	22	16	70	23	68	20	78	50	120	23	69	88	206	18	82	73	271	24	77	51	260	7	36	37	132
630	12	33	9	30	25	80	32	91	32	98	73	172	28	85	87	267	28	91	59	273	27	91	74	253	7	36	50	150
645	5	32	9	33	26	92	44	123	34	112	85	234	37	107	62	290	29	102	83	284	28	103	75	269	7	34	46	170
700	7	28	4	28	44	111	46	145	42	128	86	294	43	131	55	292	56	131	67	282	41	120	91	291	20	41	57	190
715	10	34	8	30	48	143	96	218	60	168	84	328	16	124	67	271	62	175	87	296	52	148	92	332	24	58	52	205
730	13	35	12	33	74	192	66	252	77	213	76	331	71	167	61	245	87	234	88	325	70	191	108	366	15	66	56	211
745	8	38	10	34	73	239	74	282	70	249	63	309	63	193	82	265	72	277	87	329	81	244	88	379	24	83	41	206
800	15	46	11	41	115	310	73	309	97	304	71	294	75	225	69	279	88	309	72	334	100	303	85	373	27	90	51	200
815	20	56	5	38	106	368	71	284	120	364	83	293	77	286	72	284	92	339	71	318	117	368	103	384	33	99	57	205
830	10	53	18	44	104	398	72	290	125	412	85	302	75	290	88	311	132	384	82	312	118	416	103	379	28	112	53	202
845	19	64	8	42	116	441	72	288	142	484	89	328	81	308	62	291	122	434	82	307	96	431	97	388	26	114	65	226
900	24	73	8	39	115	441	77	292	96	483	83	340	86	319	79	301	110	456	111	346	89	420	96	399	44	131	44	219
915	27	80	29	63	107	442	88	309	99	462	71	328	87	329	81	310	108	472	103	378	101	404	105	401	47	145	51	213
930	17	87	24	69	93	431	66	303	99	436	89	332	86	340	80	302	97	437	87	383	98	384	120	418	44	161	56	216
945	32	100	31	92	115	430	79	310	126	420	111	354	92	351	90	330	110	425	104	405	102	390	111	432	34	169	55	206
1000	28	104	21	105	107	422	87	320	106	430	91	362	97	362	110	361	93	408	110	404	128	429	96	432	56	181	65	227
1015	29	106	27	103	108	423	96	328	118	449	95	386	105	380	111	391	136	436	106	407	106	434	112	439	59	193	56	232
1030	25	114	38	117	114	444	84	346	115	465	97	394	90	384	79	390	98	437	77	397	103	439	113	432	58	207	60	236
1045	41	123	39	125	117	446	97	364	122	461	102	385	119	411	99	399	129	456	93	386	134	471	112	433	56	229	87	268
1100	42	137	38	142	117	456	86	363	127	482	112	406	118	432	96	385	126	489	98	374	130	473	124	461	57	230	64	267
1115	36	144	44	159	117	465	99	366	110	474	91	402	101	428	91	365	110	463	115	383	95	462	100	449	62	233	68	279
1130	23	142	37	158	114	465	125	407	126	485	77	382	91	429	89	375	123	488	93	399	136	495	93	429	61	236	67	286
1145	50	151	42	161	149	497	87	397	118	481	94	374	151	461	83	359	154	513	84	390	122	483	114	431	72	252	62	261
1200	44	153	37	160	153	533	100	411	112	466	94	356	139	482	82	345	120	507	89	381	133	486	124	431	53	248	50	247
1215	39	156	45	161	152	568	105	417	149	505	82	347	159	540	73	327	156	553	94	360	141	532	127	458	63	249	45	224
1230	38	171	66	190	132	586	94	386	106	485	91	361	104	553	92	330	135	565	93	360	145	541	123	488	69	257	54	211
1245	48	169	37	185	125	562	117	416	121	488	87	354	117	519	72	319	138	549	72	348	140	559	85	459	72	257	47	196
1300	39	164	46	194	155	564	93	409	136	512	79	339	123	503	89	326	143	572	94	353	138	564	109	444	56	260	59	205
1315	53	178	55	204	171	583	84	388	146	509	79	336	111	455	88	341	27	443	90	349	129	552	93	410	73	270	66	226
1330	50	190	49	187	134	585	94	388	134	537	103	348	109	460	87	336	133	441	92	348	130	537	113	400	39	240	47	219
1345	39	181	42	192	125	585	82	353	116	532	98	359	107	450	83	347	97	400	103	379	145	542	110	425	59	227	60	232
1400	43	185	36	182	152	582	93	353	141	537	100	380	110	437	98	356	97	354	91	376	147	551	94	410	68	239	57	230
1415	60	192	53	180	139	550	102	371	113	504	104	405	113	439	98	366	147	474	54	340	140	562	97	414	67	233	46	210
1430	49	191	34	165	153	569	104	381	133	503	69	371	112	442	90	369	142	483	71	319	125	557	98	399	52	246	47	210
1445	55	207	50	173	142	586	129	428	142	529	87	360	114	449	100	386	138	524	79	295	152	564	85	374	54	241	45	195
1500	48	212	35	172	132	566	112	447	109	497	108	368	117	456	84	372	114	541	72	276	141	558	59	339	55	228	41	179
1515	61	213	50	169	127	554	86	431	121	505	80	344	111	454	73	347	135	529	60	282	162	580	53	295	51	212	36	169
1530	45	209	33	168	141	542	69	396	122	494	78	353	124	466	73	330	128	515	49	260	137	592	51	248	36	196	39	161
1545	48	202	40	158	179	579	82	349	128	480	81	347	125	477	49	279	143	520	33	214	149	589	46	209	64	206	40	156
1600	34	188	35	158	132	579	87	324	133	504	66	305	111	471	56	251	131	537	33	175	135	583	56	206	46	197	42	157
1615	44	171	49	157	165	617	89	327	146	529	58	283	138	498	39	217	156	558	36	151	150	571	47	200	61	207	41	162
1630	36	162	46	170	111	587	72	330	134	541	52	257	113	487	24	168	106	536	29	131	145	579	35	184	35	206	38	161
1645	45	159	36	166	136	544	61	309	144	557	39	215	115	477	44	163	144	537	26	124	135	565	36	174	69	211	31	152
1700	34	159	22	153	93	505	40	262	127	551	27	176	112	478	25	132	110	516	24	115	134	564	34	152	47	212	31	141
1715	28	143	28	132	172	512	38	211	151	556	41	159	163	503	34	127	167	527	22	101	188	602	36	141	63	214	36	136
1730	30	137	30	116	103	504	39	178	109	531	34	141	91	481	20	123	109	530	20	92	112	569	56	162	42	221	28	126
1745	34	126	18	98	100	468	44	161	79	466	36	138	62	428	23	102	81	467	21	87	92	526	35	161	45	197	42	137
1800	25	117	25	101	54	429	34	155	60	399	25	136	67	383	21	98	57	414	27	90	64	456	25	152	52	202	30	136
1815	18	107	19	92	42	299	23	140	52	300	20	115	54	274	17	81	56	303	26	94	63	331	25	141	36	175	34	134
1830	24	101	17	79	38	234	23	124	44	235	23	104	33	216	35	96	54	248	12	86	42	261	39	124	29	162	28	134
1845	20	87	16	77	37	171	15	95	42	198	21	89	38	192	34	107	38	205	15	80	46	215	29	118	37	154	24	116
1900	24	86	23	75	27	144	24	85	35	173	23	87	31	156	21	107	30	178	26	79	35	186	20	113	30	132	33	119
1915	20	88	9	65	26	128	18	80	38	159	22	89	35	137	22	112	24	146	16	69	39	162	23	111	27	123	38	123
1930	29	93	20	68	18	108	10	67	30	145	16	82	40	144	19	96	26	118	16	73	38	158	17	89	28	122	34	129
1945	20	93	22	74	27	98	25	77	37	140	22	83	22	128	13	75	29	109	11	69	37	149	25	85	23	108	13	118
2000	18	87	22	73	22	93	25	78	17	122	16	76	17	114	10	64	16	95	14	57	34	148	18	83	25	103	0	85
2015	23	90	19	83	18	85	23	83	11	95	14	68	20	99	16	58	22	93	12	53	27	136	27	87	33	109	0	47
2030	17	78	14	77	16	83	15	88	21	86	16	68	16	75	18	57	13	80	19	56	41	139	20	90	33	114	0	13
2045	18	76	11	66	27	83	15	78	22	71	13	59	27	80	23	67	22	73	8	53	33	135	15	80	26	117	0	0
2100	11	69	11	55	16	77	15	68	17	71	19	62	23	86	8	65	13	70	9	48	26	127	28	90	36	128	0	0
2115	10	56	7	43	21	80	13	58	9	69	16	64	23	89	13	62	22	70	9	45	24	124	17	80	22	117	0	0
2130	11	50	8	37	15	79	10	53	15	63	11	59	14	87	7	51	14	71	10	36	19	102	22	82	24	108	0	0
2145	11	43	12	38	14	66	8	46	18	59	9	55	23	83	11	39	16	65	11	39	31	100	14	81	25	107	0	0
2200	19	51	12	39	18	68	3	34	21	63	14	50	15	75	7	38	13	65	2	32	32	106	18	71	34	105	0	0
2215	7	48	14	46	14	61	11	32	34	88	8	42	45	97	8	33	20	63	7	30	26	108	10	64	54	137	0	0
2230	7	44	12	50	5	51	7	29	12	85	6	37	21	104	8	34	18	67	3	23	28	117	23	65	54	167	0	0
2245	7	40	19	57	9	46	5	26	10	77	4	32	11	92	5	28	18	69	5	17	23	109	8	59	26	168	0	0
2300	7	28	9	54	11	39	8	31	16	72	4	22	7	84	7	28	22	78	7	22	19	96	18	59	18	152	0	0
2315	10	31	11	51	13	38	3	23	11	49	6	20	20	59	11	31	23	81	14	29	19	89	6	55	24	122	0	0
2330	8	32	8	47	6	39	7	23	9	46	1	15	12	50	9	32	10	73	6	32	13	74	8	40	30	98	0	0
2345	6	31	7	35	5	35	12	30	2	38	6	17	10	49	10	37	12	67	6	33	15	66	7	39	10	82	0	0
TOTAL	2,073	N/A	2,064	N/A	6,086	N/A	4,260	N/A	6,010	N/A	4,260	N/A	5,423	N/A	4,113	N/A	5,976	N/A	4,191	N/A	6,403	N/A	5,033	N/A	3,135	N/A	2,926	N/A
AM	100		92		442		310		484		354		351		330		472		405		431		432		169		226	
NOON	207		204		586		428		537		406		553		399		572		407		564		488		270		286	
PM	213		172		617		447		557		368		503		372		558		282		602		339		228		179	
EVEN	90		83		93		88		122		76		114		67		95		57		148		90		168		85	

Telephone: (510) 232-1271 *Fax: (510) 232-1272*

Data File: 'VanNess_NO_Inyo_NB_031809.rdf'
Site Code: '000000000000'
Start Date: 3/19/2009
Start Time: 12:00 AM
Sensor Layout: '11'

'LOCATION': 'Van Ness'
'CROSS ST': 'N/O Inyo'
'COUNT': 'Downtown Study'

Thursday			Friday			Saturday			Sunday		
Date	Time	NB	Date	Time	NB	Date	Time	NB	Date	Time	NB
3/19/2009	12:00 AM	39	3/20/2009	12:00 AM	30	3/21/2009	12:00 AM	71	3/22/2009	12:00 AM	60
3/19/2009	1:00 AM	14	3/20/2009	1:00 AM	23	3/21/2009	1:00 AM	40	3/22/2009	1:00 AM	58
3/19/2009	2:00 AM	7	3/20/2009	2:00 AM	12	3/21/2009	2:00 AM	24	3/22/2009	2:00 AM	27
3/19/2009	3:00 AM	4	3/20/2009	3:00 AM	8	3/21/2009	3:00 AM	11	3/22/2009	3:00 AM	13
3/19/2009	4:00 AM	19	3/20/2009	4:00 AM	25	3/21/2009	4:00 AM	12	3/22/2009	4:00 AM	5
3/19/2009	5:00 AM	61	3/20/2009	5:00 AM	76	3/21/2009	5:00 AM	30	3/22/2009	5:00 AM	18
3/19/2009	6:00 AM	122	3/20/2009	6:00 AM	110	3/21/2009	6:00 AM	45	3/22/2009	6:00 AM	41
3/19/2009	7:00 AM	390	3/20/2009	7:00 AM	371	3/21/2009	7:00 AM	104	3/22/2009	7:00 AM	60
3/19/2009	8:00 AM	506	3/20/2009	8:00 AM	458	3/21/2009	8:00 AM	148	3/22/2009	8:00 AM	85
3/19/2009	9:00 AM	430	3/20/2009	9:00 AM	430	3/21/2009	9:00 AM	227	3/22/2009	9:00 AM	143
3/19/2009	10:00 AM	425	3/20/2009	10:00 AM	426	3/21/2009	10:00 AM	242	3/22/2009	10:00 AM	155
3/19/2009	11:00 AM	487	3/20/2009	11:00 AM	543	3/21/2009	11:00 AM	318	3/22/2009	11:00 AM	216
3/19/2009	12:00 PM	501	3/20/2009	12:00 PM	499	3/21/2009	12:00 PM	284	3/22/2009	12:00 PM	292
3/19/2009	1:00 PM	528	3/20/2009	1:00 PM	564	3/21/2009	1:00 PM	330	3/22/2009	1:00 PM	312
3/19/2009	2:00 PM	484	3/20/2009	2:00 PM	534	3/21/2009	2:00 PM	298	3/22/2009	2:00 PM	249
3/19/2009	3:00 PM	471	3/20/2009	3:00 PM	551	3/21/2009	3:00 PM	291	3/22/2009	3:00 PM	200
3/19/2009	4:00 PM	382	3/20/2009	4:00 PM	485	3/21/2009	4:00 PM	230	3/22/2009	4:00 PM	151
3/19/2009	5:00 PM	331	3/20/2009	5:00 PM	402	3/21/2009	5:00 PM	202	3/22/2009	5:00 PM	152
3/19/2009	6:00 PM	193	3/20/2009	6:00 PM	283	3/21/2009	6:00 PM	182	3/22/2009	6:00 PM	101
3/19/2009	7:00 PM	150	3/20/2009	7:00 PM	196	3/21/2009	7:00 PM	177	3/22/2009	7:00 PM	91
3/19/2009	8:00 PM	115	3/20/2009	8:00 PM	222	3/21/2009	8:00 PM	135	3/22/2009	8:00 PM	61
3/19/2009	9:00 PM	88	3/20/2009	9:00 PM	238	3/21/2009	9:00 PM	192	3/22/2009	9:00 PM	60
3/19/2009	10:00 PM	91	3/20/2009	10:00 PM	179	3/21/2009	10:00 PM	168	3/22/2009	10:00 PM	30
3/19/2009	11:00 PM	64	3/20/2009	11:00 PM	132	3/21/2009	11:00 PM	125	3/22/2009	11:00 PM	17
		5,902			6,797			3,886			2,597

Data File: 'VanNess_NO_Inyo_SB_031809.rdf'
Site Code: '000000000000'
Start Date: 3/19/2009
Start Time: 12:00 AM
Sensor Layout: '11'

'LOCATION': 'Van Ness'
'CROSS ST': 'N/O Inyo'
'COUNT': 'Downtown Study'

Thursday			Friday			Saturday			Sunday		
Date	Time	SB	Date	Time	SB	Date	Time	SB	Date	Time	SB
3/19/2009	12:00 AM	20	3/20/2009	12:00 AM	28	3/21/2009	12:00 AM	53	3/22/2009	12:00 AM	53
3/19/2009	1:00 AM	34	3/20/2009	1:00 AM	44	3/21/2009	1:00 AM	62	3/22/2009	1:00 AM	105
3/19/2009	2:00 AM	7	3/20/2009	2:00 AM	16	3/21/2009	2:00 AM	33	3/22/2009	2:00 AM	37
3/19/2009	3:00 AM	4	3/20/2009	3:00 AM	4	3/21/2009	3:00 AM	5	3/22/2009	3:00 AM	8
3/19/2009	4:00 AM	8	3/20/2009	4:00 AM	13	3/21/2009	4:00 AM	8	3/22/2009	4:00 AM	4
3/19/2009	5:00 AM	13	3/20/2009	5:00 AM	11	3/21/2009	5:00 AM	9	3/22/2009	5:00 AM	7
3/19/2009	6:00 AM	43	3/20/2009	6:00 AM	34	3/21/2009	6:00 AM	23	3/22/2009	6:00 AM	8
3/19/2009	7:00 AM	112	3/20/2009	7:00 AM	105	3/21/2009	7:00 AM	42	3/22/2009	7:00 AM	27
3/19/2009	8:00 AM	176	3/20/2009	8:00 AM	146	3/21/2009	8:00 AM	88	3/22/2009	8:00 AM	42
3/19/2009	9:00 AM	219	3/20/2009	9:00 AM	175	3/21/2009	9:00 AM	123	3/22/2009	9:00 AM	61
3/19/2009	10:00 AM	217	3/20/2009	10:00 AM	221	3/21/2009	10:00 AM	153	3/22/2009	10:00 AM	83
3/19/2009	11:00 AM	293	3/20/2009	11:00 AM	293	3/21/2009	11:00 AM	194	3/22/2009	11:00 AM	106
3/19/2009	12:00 PM	287	3/20/2009	12:00 PM	327	3/21/2009	12:00 PM	203	3/22/2009	12:00 PM	150
3/19/2009	1:00 PM	288	3/20/2009	1:00 PM	306	3/21/2009	1:00 PM	188	3/22/2009	1:00 PM	174
3/19/2009	2:00 PM	262	3/20/2009	2:00 PM	305	3/21/2009	2:00 PM	180	3/22/2009	2:00 PM	140
3/19/2009	3:00 PM	285	3/20/2009	3:00 PM	313	3/21/2009	3:00 PM	193	3/22/2009	3:00 PM	160
3/19/2009	4:00 PM	258	3/20/2009	4:00 PM	287	3/21/2009	4:00 PM	148	3/22/2009	4:00 PM	94
3/19/2009	5:00 PM	197	3/20/2009	5:00 PM	269	3/21/2009	5:00 PM	120	3/22/2009	5:00 PM	72
3/19/2009	6:00 PM	147	3/20/2009	6:00 PM	188	3/21/2009	6:00 PM	89	3/22/2009	6:00 PM	67
3/19/2009	7:00 PM	72	3/20/2009	7:00 PM	126	3/21/2009	7:00 PM	97	3/22/2009	7:00 PM	60
3/19/2009	8:00 PM	77	3/20/2009	8:00 PM	124	3/21/2009	8:00 PM	95	3/22/2009	8:00 PM	63
3/19/2009	9:00 PM	53	3/20/2009	9:00 PM	93	3/21/2009	9:00 PM	77	3/22/2009	9:00 PM	33
3/19/2009	10:00 PM	49	3/20/2009	10:00 PM	83	3/21/2009	10:00 PM	90	3/22/2009	10:00 PM	30
3/19/2009	11:00 PM	29	3/20/2009	11:00 PM	78	3/21/2009	11:00 PM	76	3/22/2009	11:00 PM	19
		3,150			3,589			2,349			1,603

B A Y M E T R I C S

HST PROJECT - FRESNO

Date	15-Nov-09 Sunday				16-Nov-09 Monday				17-Nov-09 Tuesday				18-Nov-09 Wednesday				19-Nov-09 Thursday				20-Nov-09 Friday				21-Nov-09 Saturday			
Location	26. On Van Ness Avenue, between Inyo Street and Ventura Avenue																											
Direction	NB		SB		NB		SB		NB		SB		NB		SB		NB		SB		NB		SB		NB		SB	
TIME	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN
1200	7	0	5	0	3	0	1	0	5	0	6	0	6	0	6	0	5	0	1	0	1	0	3	0	1	0	2	0
1215	7	0	4	0	2	0	2	0	2	0	5	0	5	0	4	0	1	0	3	0	1	0	0	0	1	0	1	0
1230	6	0	6	0	0	0	2	0	1	0	4	0	5	0	2	0	1	0	4	0	4	0	2	0	2	0	8	0
1245	4	24	10	25	1	6	3	8	1	9	1	16	2	18	1	13	5	12	1	9	0	6	1	6	0	4	2	13
100	3	20	15	35	3	6	4	11	3	7	1	11	0	12	4	11	2	9	0	8	0	5	1	4	2	5	1	12
115	5	18	10	41	3	7	2	11	2	7	3	9	3	10	1	8	2	10	0	5	4	8	1	5	0	4	0	11
130	10	22	30	65	0	7	1	10	0	6	0	5	1	6	1	7	3	12	1	2	1	5	0	3	1	3	0	3
145	6	24	20	75	0	6	1	8	5	10	3	7	0	4	3	9	4	11	3	4	2	7	2	4	4	7	3	4
200	0	21	3	63	2	5	1	5	0	7	5	11	0	4	3	8	2	11	2	6	5	12	0	3	5	10	4	7
215	3	19	6	59	1	3	3	6	0	5	3	11	2	3	1	8	1	10	2	8	5	13	2	4	6	16	2	9
230	3	12	3	32	0	3	3	8	2	7	3	14	1	3	4	11	9	16	5	12	7	19	2	6	14	29	1	10
245	2	8	4	16	0	3	3	10	2	4	2	13	1	4	2	10	8	20	4	13	20	37	3	7	19	44	1	8
300	3	11	3	16	8	9	2	11	2	6	3	11	9	13	0	7	15	33	0	11	23	55	5	12	16	55	2	6
315	1	9	4	14	2	10	2	10	5	11	1	9	17	28	2	8	22	54	3	12	30	80	8	18	8	57	5	9
330	0	6	1	12	1	11	1	8	6	15	4	10	14	41	3	7	24	69	3	10	22	95	1	17	5	48	3	11
345	1	5	2	10	6	17	3	8	10	23	1	9	17	57	2	7	42	103	7	13	25	100	8	22	13	42	3	13
400	0	2	1	8	3	12	2	8	10	31	1	7	19	67	4	11	15	103	3	16	34	111	9	26	20	46	4	15
415	1	2	4	8	8	18	1	7	23	49	0	6	39	89	3	12	23	104	4	17	60	141	14	32	21	59	5	15
430	0	2	1	8	7	24	0	6	23	66	2	4	19	94	6	15	40	120	3	17	61	180	14	45	22	76	11	23
445	1	2	0	6	23	41	1	4	37	93	5	8	24	101	8	21	66	144	20	30	95	250	13	50	25	88	12	32
500	2	4	2	7	14	52	0	2	18	101	3	10	42	124	12	29	71	200	16	43	106	322	22	63	39	107	17	45
515	5	8	1	4	41	85	3	4	26	104	6	16	67	152	15	41	129	306	17	56	157	419	16	65	40	126	25	65
530	9	17	2	5	9	87	8	12	49	130	8	22	71	204	14	49	136	402	26	79	171	529	32	83	27	131	15	69
545	11	27	0	5	27	91	3	14	70	163	16	33	113	293	13	54	149	485	28	87	130	564	17	87	45	151	18	75
600	3	28	5	8	46	123	17	31	82	227	10	40	111	362	28	70	171	585	30	101	130	588	33	98	43	155	15	73
615	5	28	2	9	58	140	17	45	118	319	16	50	141	436	24	79	195	651	18	102	87	518	28	110	58	173	21	69
630	2	21	4	11	100	231	9	46	154	424	22	64	135	500	41	106	142	657	40	116	89	436	34	112	54	200	34	88
645	7	17	2	13	122	326	24	67	175	529	35	83	113	500	43	136	117	625	31	119	127	433	41	136	60	215	25	95
700	7	21	1	9	162	442	19	69	209	656	25	98	102	491	37	145	97	551	36	125	90	393	51	154	57	229	37	117
715	10	26	6	13	166	550	29	81	186	724	25	107	107	457	43	164	84	440	41	148	128	434	35	161	63	234	38	134
730	7	31	8	17	166	616	21	93	133	703	42	127	91	413	32	155	104	402	50	158	91	436	57	184	59	239	35	135
745	16	40	7	22	145	639	36	105	92	620	27	119	82	382	33	145	101	386	41	168	102	411	49	192	61	240	31	141
800	11	44	7	28	121	598	25	111	105	516	44	138	116	396	18	126	89	378	41	173	89	410	41	182	63	246	33	137
815	16	50	4	26	108	540	36	118	95	425	52	165	107	396	35	118	92	386	36	168	111	393	55	202	68	251	38	137
830	17	60	11	29	91	465	43	140	94	386	43	166	88	393	53	139	94	376	49	167	94	396	51	196	67	259	42	144
845	24	68	3	25	100	420	34	138	81	375	41	180	99	410	43	149	90	365	46	172	111	405	69	216	61	259	47	160
900	26	83	5	23	112	411	38	151	79	349	55	191	107	401	50	181	100	376	60	191	127	443	50	225	67	263	30	157
915	40	107	17	36	103	406	44	159	73	327	54	193	86	380	47	193	111	395	54	209	110	442	71	241	66	261	37	156
930	58	148	15	40	91	406	43	159	95	328	43	193	94	386	49	189	101	402	54	214	114	462	73	263	62	256	34	148
945	43	167	14	51	90	396	46	171	98	345	53	205	98	385	49	195	117	429	51	219	118	469	67	261	67	262	55	156
1000	38	179	15	61	102	386	46	179	108	374	54	204	130	408	49	194	105	434	65	224	126	468	71	282	68	263	51	177
1015	44	183	12	56	89	372	58	193	97	398	50	200	109	431	65	212	99	422	62	232	98	456	62	273	62	259	36	176
1030	49	174	27	68	98	379	54	204	108	411	45	202	123	460	54	217	129	450	54	232	87	429	67	267	77	274	35	177
1045	48	179	14	68	110	399	63	221	94	407	72	221	82	444	58	226	126	459	64	245	122	433	55	255	72	279	61	183
1100	31	172	25	78	125	422	62	237	95	394	74	241	87	401	52	229	110	464	70	250	125	432	81	265	63	274	30	162
1115	52	180	25	91	107	440	65	244	89	386	53	244	98	390	47	211	104	469	65	253	108	442	77	280	39	251	36	162
1130	62	193	33	97	115	457	75	265	109	387	65	264	103	370	55	212	90	430	46	245	95	450	62	275	71	245	38	165
1145	40	185	29	112	126	473	55	257	138	431	49	241	101	389	62	216	111	415	53	234	102	430	72	292	57	230	40	144
1200	44	198	29	116	123	471	68	263	116	452	71	238	112	414	49	213	92	397	51	215	121	426	59	270	51	218	32	146
1215	46	192	30	121	147	511	63	261	97	460	45	230	83	399	50	216	108	401	55	205	110	428	69	262	52	231	37	147
1230	50	180	36	124	154	550	44	230	101	452	54	219	88	384	62	223	99	410	60	219	89	422	80	280	72	232	39	148
1245	52	192	27	122	116	540	70	245	92	406	52	222	107	390	56	217	98	397	59	225	112	432	53	261	44	219	34	142
1300	43	191	32	125	149	566	57	234	105	395	58	209	103	381	58	226	111	416	50	224	113	424	60	262	45	213	36	146
1315	50	195	28	123	108	527	65	236	100	398	52	216	93	391	76	252	109	417	64	233	113	427	59	252	50	211	39	148
1330	61	206	26	113	101	474	51	243	92	389	59	221	108	411	52	242	106	424	59	232	98	436	75	247	52	191	21	130
1345	62	216	34	120	96	454	62	235	89	386	51	220	108	412	57	243	92	418	70	243	95	419	73	267	53	200	37	133
1400	70	243	21	109	93	398	54	232	106	387	62	224	109	418	73	258	71	378	71	264	99	405	68	275	47	202	23	120
1415	37	230	38	119	92	382	60	227	94	381	69	241	76	401	48	230	85	354	61	261	79	371	73	289	43	195	25	106
1430	52	221	25	118	94	375	63	239	103	392	59	241	72	365	64	242	93	341	49	251	103	376	77	291	66	209	29	114
1445	63	222	33	117	108	387	73	250	86	389	58	248	85	342	67	252	63	312	86	267	77	358	55	273	55	211	22	99
1500	49	201	25	121	121	415	77	273	91	374	56	242	72	305	70	249	85	326	68	264	67	326	47	252	43	207	27	103
1515	53	217	29	112	96	419	72	285	80	360	60	233	78	307	67	268	54	295	43	246	47	294	37	216	32	196	17	95
1530	35	200	23	110	84	409	52	274	74	331	64	238	52	287	53	257	41	243	43	240	44	235	27	166	36	166	19	85
1545	30	167	28	105	92	393	75	276	74	319	85	265	56	258	50	240	43	223	24	178	53	211	23	134	36	147	9	72
1600	35	153	25	105	79	351	81	280	82	310	47	256	58	244	29	199	45	183	18	128	37	181	24	111	40	144	10	55
1615	47	147	19	95	77	332	82	290	46	276	52	248	49	215	29	161	34	163	18	103	40	174	15	89	26	138	10	48
1630	35	147	38	110	59	307	55	293	36	238	29	213	43	206	14	122	47	169	16	76	37	167	10	72	29	131	10	39
1645	35	152	22	104	57	272	49	267	33	197	27	155	25	175	23	95	30	156	23	75	36	150	5	54	26	121	9	39
1700	33	150	24	103	36	229	28	214	39	154	16	124	40	157	14	80	25	136	14	71	29	142	14	44	37	118	14	43
1715	29	132	30	114	40	192	23	155	40	148	15	87	37	145	16	67	23	125	9	62	25	127	19	48	19	111	8	41
1730	22	119	17	93	37	170	21	121	38	150	17	75	42	144	15	68	19	97	12	58	22	112	16	54	24	106	13	44
1745	24	108	9	80	34	147	18	90	29	146	13	61	16	135	8	53	23	90	8	43	33	109	7	56	22	102	13	48
1800	19	94	9	65	26	137	16	78	21	128	14	59	14	109	16	55	12	77	13	42	24	104	18	60	15	80	19	53
1815	20	85	8	43	26	123	14	69	27	115	12	56	18	90	10	49	15	69	6	39	23	102	17	58	13	74	10	55
1830	17	80	5	31	16	102	7	55	21	98	14	53	16	64	22	56	11	61	12	39	25	105	22	64	21	71	7	49
1845	15	71	11	33	16	84	9	46	13	82	8	48	18	66	19	67	15	53	7	38	22	94	8	65	31	80	14	50
1900	24	76	11	35	18	76	15	45	11	72	7	41	21	73	12	63	13	54	15	40	27	97	6	53	37	102	20	51
1915	13	69	8	35	11	61	9	40	20	65	10	39	18	73	15	68	19	58	6	40	29	103	15	51	12	101	17	58
1930	14	66	14	44	19	64	6	39	17	61	10	35	14	71	10	56	17	64	9	37	8	86	10	39	28	108	15	66
1945	15	66	11	44	17	65	11	41	9	57	9	36	16	69	5	42	16	65	7	37	18	82	12	43	14	91	8	60
2000	12	54	6	39	15	62	7	33	8	54	7	36	12	60	3	33	11	63	9	31	16	71	13	50	22	76	10	50
2015	13	54	7	38	19	70	16	40	16	50	5	31	14	56	7	25	12	56	9	34	19	61	10	45	12	76	4	37
2030	9	49	8	32	11	62	5	39	14	47	8	29	10	52	1	16	14	53	12	37	10	63	9	44	11	59	12	34
2045	12	46	5	26	14	59	13	41	19	57	10	30	8	44	5	16	11	48	7	37	10	55	4	36	18	63	13	39
2100	15	49	2	22	7	51	1	35	12	61	6	29	10	42	2	15	4	41	7	35	7	46	11	34	14	55	5	34
2115	5	41	3	18	5	37	4	23	6	51	4	28	8	36	10	18	9	38	2	28	14	41	8	32	7	50	11	41
2130	6	38	2	12	8	34	8	26	8	45	6	26	6	32	0	17	6	30	3	19	13	44	11	34	6	45	8	37
2145	11	37	6	13	4	24	4	17	7	33	6	22	6	30	3	15	2	21	3	15	7	41	9	39	8	35	12	36
2200	6	28	7	18	4	21	1	17	6	27	2	18	3	23	4	17	8	25	3	11	8	42	6	34	4	25	9	40
2215	6	29	9	24	6	22	6	19	6	27	4	18	5	20	4	11	3	19	4	13	4	32	7	33	3	21	9	38
2230	5	28	6	28	11	25	1	12	5	24	2	14	5	19	10	21	3	16	3	13	5	24	15	37	7	22	9	39
2245	6	23	11	33	4	25	3	11	8	25	1	9	4	17	1	19	1	15	5	15	6	23	6	34	5	19	12	39
2300	3	20	4	30	2	23	4	14	5	24	5	12	7	21	3	18	2	9	7	19	6	21	6	34	1	16	4	34
2315	9	23	2	23	6	23	4	12	5	23	5	13	2	18	4	18	6	12	6	21	6	23	5	32	3	16	7	32
2330	3	21	2	19	2	14	3	14	1	19	4	15	1	14	6	14	6	15	2	20	3	21	1	18	4	13	5	28
2345	1	16	4	12	4	14	4	15	6	17	2	16	4	14	5	18	1	15	4	19	4	19	1	13	5	13	0	16
TOTAL	2,062	N/A	1,237	N/A	5,281	N/A	2,545	N/A	5,123	N/A	2,467	N/A	4,939	N/A	2,458	N/A	5,267	N/A	2,505	N/A	5,538	N/A	2,803	N/A	3,122	N/A	1,797	N/A
AM	167		51		639		171		724		205		500		195		657		219		588		263		263		160	
NOON	243		125		566		265		460		264		460		258		469		267		468		292		279		183	
PM	217		121		419		293		374		265		307		268		326		264		326		252		207		103	
EVEN	54		39		70		41		61		36		60		33		63		37		71		50		76		50	

Telephone: (510) 232-1271 *Fax: (510) 232-1272*

B A Y M E T R I C S

HST PROJECT - FRESNO

Date	15-Nov-09 Sunday				16-Nov-09 Monday				17-Nov-09 Tuesday				18-Nov-09 Wednesday				19-Nov-09 Thursday				20-Nov-09 Friday				21-Nov-09 Saturday			
Location	7. On Stanislaus Street, between Van Ness Avenue and O Street																											
Direction	EB		WB		EB		WB		EB		WB		EB		WB		EB		WB		EB		WB		EB		WB	
TIME	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN
1200	0	0	12	0	0	0	14	0	0	0	12	0	0	0	7	0	0	0	5	0	0	0	6	0	0	0	7	0
1215	0	0	13	0	0	0	7	0	0	0	1	0	0	0	6	0	0	0	8	0	0	0	8	0	0	0	5	0
1230	0	0	8	0	0	0	8	0	0	0	5	0	0	0	4	0	0	0	5	0	0	0	6	0	0	0	9	0
1245	0	0	9	42	0	0	4	33	0	0	2	20	0	0	3	20	0	0	4	22	0	0	6	26	0	0	5	26
100	0	0	9	39	0	0	3	22	0	0	6	14	0	0	5	18	0	0	7	24	0	0	2	22	0	0	3	22
115	0	0	6	32	0	0	1	16	0	0	5	18	0	0	6	18	0	0	4	20	0	0	2	16	0	0	9	26
130	0	0	3	27	0	0	2	10	0	0	0	13	0	0	3	17	0	0	3	18	0	0	3	13	0	0	4	21
145	0	0	1	19	0	0	2	8	0	0	3	14	0	0	2	16	0	0	5	19	0	0	1	8	0	0	5	21
200	0	0	5	15	0	0	1	6	0	0	3	11	0	0	1	12	0	0	3	15	0	0	0	6	0	0	9	27
215	0	0	4	13	0	0	3	8	0	0	5	11	0	0	4	10	0	0	1	12	0	0	4	8	0	0	6	24
230	0	0	6	16	0	0	3	9	0	0	1	12	0	0	0	7	0	0	0	9	0	0	2	7	0	0	4	24
245	0	0	3	18	0	0	2	9	0	0	4	13	0	0	3	8	0	0	3	7	0	0	3	9	0	0	7	26
300	0	0	3	16	0	0	2	10	0	0	2	12	0	0	3	10	0	0	5	9	0	0	1	10	0	0	3	20
315	0	0	5	17	0	0	0	7	0	0	0	7	0	0	2	8	0	0	4	12	0	0	1	7	0	0	4	18
330	0	0	0	11	0	0	2	6	0	0	3	9	0	0	3	11	0	0	1	13	0	0	1	6	0	0	3	17
345	0	0	5	13	0	0	4	8	0	0	3	8	0	0	4	12	0	0	5	15	0	0	6	9	0	0	0	10
400	0	0	4	14	0	0	8	14	0	0	7	13	0	0	7	16	0	0	6	16	0	0	5	13	0	0	4	11
415	0	0	3	12	0	0	6	20	0	0	7	20	0	0	7	21	0	0	10	22	0	0	7	19	0	0	3	10
430	0	0	3	15	0	0	11	29	0	0	10	27	0	0	13	31	0	0	9	30	0	0	8	26	0	0	4	11
445	0	0	4	14	0	0	12	37	0	0	13	37	0	0	14	41	0	0	12	37	0	0	13	33	0	0	2	13
500	0	0	3	13	0	0	7	36	0	0	8	38	0	0	9	43	0	0	10	41	0	0	9	37	0	0	4	13
515	0	0	3	13	0	0	11	41	0	0	10	41	0	0	8	44	0	0	12	43	0	0	9	39	0	0	6	16
530	0	0	10	20	0	0	17	47	0	0	15	46	0	0	17	48	0	0	13	47	0	0	13	44	0	0	7	19
545	0	0	12	28	0	0	10	45	0	0	11	44	0	0	14	48	0	0	15	50	0	0	14	45	0	0	6	23
600	0	0	2	27	0	0	17	55	0	0	19	55	0	0	15	54	0	0	14	54	0	0	18	54	0	0	6	25
615	0	0	3	27	0	0	20	64	0	0	18	63	0	0	19	65	0	0	21	63	0	0	19	64	0	0	3	22
630	0	0	4	21	0	0	26	73	0	0	25	73	0	0	23	71	0	0	24	74	0	0	28	79	0	0	5	20
645	0	0	12	21	0	0	32	95	0	0	29	91	0	0	29	86	0	0	34	93	0	0	27	92	0	0	7	21
700	0	0	12	31	0	0	49	127	0	0	46	118	0	0	39	110	0	0	35	114	0	0	34	108	0	0	12	27
715	0	0	13	41	0	0	38	145	0	0	41	141	0	0	41	132	0	0	47	140	0	0	47	136	0	0	11	35
730	0	0	7	44	0	0	55	174	0	0	53	169	0	0	57	166	0	0	53	169	0	0	53	161	0	0	13	43
745	0	0	16	48	0	0	73	215	0	0	67	207	0	0	69	206	0	0	71	206	0	0	67	201	0	0	14	50
800	0	0	15	51	0	0	90	256	0	0	87	248	0	0	87	254	0	0	77	248	0	0	88	255	0	0	15	53
815	0	0	14	52	0	0	88	306	0	0	91	298	0	0	91	304	0	0	89	290	0	0	93	301	0	0	17	59
830	0	0	16	61	0	0	80	331	0	0	89	334	0	0	87	334	0	0	76	313	0	0	87	335	0	0	14	60
845	0	0	17	62	0	0	67	325	0	0	76	343	0	0	73	338	0	0	69	311	0	0	79	347	0	0	16	62
900	0	0	30	77	0	0	70	305	0	0	68	324	0	0	68	319	0	0	63	297	0	0	73	332	0	0	24	71
915	0	0	22	85	0	0	51	268	0	0	54	287	0	0	56	284	0	0	62	270	0	0	64	303	0	0	27	81
930	0	0	25	94	0	0	66	254	0	0	52	250	0	0	63	260	0	0	68	262	0	0	59	275	0	0	21	88
945	0	0	17	94	0	0	48	235	0	0	61	235	0	0	57	244	0	0	66	259	0	0	59	255	0	0	23	95
1000	0	0	33	97	0	0	68	233	0	0	69	236	0	0	59	235	0	0	89	285	0	0	63	245	0	0	32	103
1015	0	0	31	106	0	0	71	253	0	0	73	255	0	0	77	256	0	0	64	287	0	0	74	255	0	0	32	108
1030	0	0	34	115	0	0	75	262	0	0	72	275	0	0	74	267	0	0	61	280	0	0	81	277	0	0	37	124
1045	0	0	23	121	0	0	68	282	0	0	71	285	0	0	72	282	0	0	71	285	0	0	77	295	0	0	34	135
1100	0	0	37	125	0	0	88	302	0	0	83	299	0	0	76	299	0	0	70	266	0	0	69	301	0	0	35	138
1115	0	0	29	123	0	0	77	308	0	0	87	313	0	0	90	312	0	0	75	277	0	0	83	310	0	0	36	142
1130	0	0	32	121	0	0	89	322	0	0	81	322	0	0	81	319	0	0	77	293	0	0	82	311	0	0	29	134
1145	0	0	31	129	0	0	88	342	0	0	88	339	0	0	82	329	0	0	79	301	0	0	93	327	0	0	33	133
1200	0	0	31	123	0	0	87	341	0	0	79	335	0	0	93	346	0	0	84	315	0	0	81	339	0	0	37	135
1215	0	0	45	139	0	0	105	369	0	0	82	330	0	0	76	332	0	0	81	321	0	0	89	345	0	0	38	137
1230	0	0	33	140	0	0	64	344	0	0	67	316	0	0	69	320	0	0	72	316	0	0	85	348	0	0	41	149
1245	0	0	45	154	0	0	100	356	0	0	69	297	0	0	73	311	0	0	70	307	0	0	91	346	0	0	39	155
1300	0	0	43	166	0	0	74	343	0	0	83	301	0	0	72	290	0	0	83	306	0	0	86	351	0	0	42	160
1315	0	0	38	159	0	0	98	336	0	0	81	300	0	0	93	307	0	0	84	309	0	0	99	361	0	0	38	160
1330	0	0	43	169	0	0	80	352	0	0	85	318	0	0	81	319	0	0	79	316	0	0	95	371	0	0	47	166
1345	0	0	54	178	0	0	86	338	0	0	94	343	0	0	90	336	0	0	83	329	0	0	83	363	0	0	52	179
1400	0	0	43	178	0	0	81	345	0	0	76	336	0	0	75	339	0	0	77	323	0	0	85	362	0	0	49	186
1415	0	0	33	173	0	0	74	321	0	0	67	322	0	0	64	310	0	0	73	312	0	0	81	344	0	0	38	186
1430	0	0	29	159	0	0	73	314	0	0	88	325	0	0	82	311	0	0	71	304	0	0	72	321	0	0	43	182
1445	0	0	34	139	0	0	92	320	0	0	87	318	0	0	87	308	0	0	90	311	0	0	79	317	0	0	45	175
1500	0	0	35	131	0	0	77	316	0	0	91	333	0	0	76	309	0	0	72	306	0	0	86	318	0	0	47	173
1515	0	0	39	137	0	0	101	343	0	0	97	363	0	0	106	351	0	0	89	322	0	0	97	334	0	0	37	172
1530	0	0	36	144	0	0	91	361	0	0	84	359	0	0	89	358	0	0	91	342	0	0	93	355	0	0	29	158
1545	0	0	20	130	0	0	98	367	0	0	83	355	0	0	83	354	0	0	86	338	0	0	97	373	0	0	42	155
1600	0	0	36	131	0	0	79	369	0	0	92	356	0	0	83	361	0	0	94	360	0	0	91	378	0	0	39	147
1615	0	0	38	130	0	0	101	369	0	0	91	350	0	0	102	357	0	0	97	368	0	0	107	388	0	0	43	153
1630	0	0	30	124	0	0	102	380	0	0	86	352	0	0	86	354	0	0	91	368	0	0	101	396	0	0	51	175
1645	0	0	38	142	0	0	107	389	0	0	94	363	0	0	95	366	0	0	99	381	0	0	98	397	0	0	42	175
1700	0	0	39	145	0	0	104	414	0	0	99	370	0	0	108	391	0	0	97	384	0	0	111	417	0	0	53	189
1715	0	0	35	142	0	0	131	444	0	0	113	392	0	0	129	418	0	0	101	388	0	0	123	433	0	0	39	185
1730	0	0	42	154	0	0	104	446	0	0	109	415	0	0	106	438	0	0	95	392	0	0	117	449	0	0	43	177
1745	0	0	27	143	0	0	90	429	0	0	74	395	0	0	55	398	0	0	86	379	0	0	94	445	0	0	28	163
1800	0	0	22	126	0	0	62	387	0	0	67	363	0	0	68	358	0	0	71	353	0	0	56	390	0	0	43	153
1815	0	0	26	117	0	0	59	315	0	0	65	315	0	0	65	294	0	0	61	313	0	0	64	331	0	0	34	148
1830	0	0	29	104	0	0	60	271	0	0	54	260	0	0	46	234	0	0	53	271	0	0	65	279	0	0	40	145
1845	0	0	28	105	0	0	47	228	0	0	67	253	0	0	62	241	0	0	59	244	0	0	63	248	0	0	49	166
1900	0	0	29	112	0	0	37	203	0	0	56	242	0	0	46	219	0	0	53	226	0	0	47	239	0	0	29	152
1915	0	0	20	106	0	0	33	177	0	0	29	206	0	0	36	190	0	0	48	213	0	0	41	216	0	0	23	141
1930	0	0	10	87	0	0	30	147	0	0	31	183	0	0	25	169	0	0	33	193	0	0	30	181	0	0	33	134
1945	0	0	22	81	0	0	38	138	0	0	30	146	0	0	30	137	0	0	31	165	0	0	29	147	0	0	23	108
2000	0	0	16	68	0	0	29	130	0	0	27	117	0	0	25	116	0	0	29	141	0	0	33	133	0	0	25	104
2015	0	0	25	73	0	0	30	127	0	0	28	116	0	0	35	115	0	0	42	135	0	0	40	132	0	0	30	111
2030	0	0	12	75	0	0	41	138	0	0	42	127	0	0	55	145	0	0	39	141	0	0	34	136	0	0	23	101
2045	0	0	12	65	0	0	39	139	0	0	39	136	0	0	41	156	0	0	37	147	0	0	35	142	0	0	14	92
2100	0	0	11	60	0	0	25	135	0	0	24	133	0	0	23	154	0	0	34	152	0	0	27	136	0	0	20	87
2115	0	0	16	51	0	0	17	122	0	0	24	129	0	0	25	144	0	0	21	131	0	0	29	125	0	0	20	77
2130	0	0	15	54	0	0	15	96	0	0	9	96	0	0	11	100	0	0	18	110	0	0	18	109	0	0	14	68
2145	0	0	6	48	0	0	18	75	0	0	12	69	0	0	10	69	0	0	12	85	0	0	21	95	0	0	24	78
2200	0	0	14	51	0	0	19	69	0	0	11	56	0	0	7	53	0	0	9	60	0	0	14	82	0	0	22	80
2215	0	0	14	49	0	0	5	57	0	0	6	38	0	0	12	40	0	0	10	49	0	0	7	60	0	0	21	81
2230	0	0	22	56	0	0	10	52	0	0	10	39	0	0	11	40	0	0	9	40	0	0	8	50	0	0	18	85
2245	0	0	6	56	0	0	7	41	0	0	7	34	0	0	8	38	0	0	7	35	0	0	9	38	0	0	16	77
2300	0	0	10	52	0	0	4	26	0	0	4	27	0	0	7	38	0	0	10	36	0	0	3	27	0	0	15	70
2315	0	0	12	50	0	0	11	32	0	0	11	32	0	0	6	32	0	0	7	33	0	0	8	28	0	0	12	61
2330	0	0	9	37	0	0	4	26	0	0	4	26	0	0	3	24	0	0	4	28	0	0	7	27	0	0	16	59
2345	0	0	8	39	0	0	3	22	0	0	3	22	0	0	4	20	0	0	3	24	0	0	2	20	0	0	10	53
TOTAL	0	N/A	1,889	N/A	0	N/A	4,476	N/A	0	N/A	4,367	N/A	0	N/A	4,364	N/A	0	N/A	4,350	N/A	0	N/A	4,578	N/A	0	N/A	2,191	N/A
AM	0		94		0		331		0		343		0		338		0		313		0		347		0		95	
NOON	0		178		0		369		0		343		0		346		0		329		0		371		0		186	
PM	0		154		0		446		0		415		0		438		0		392		0		449		0		189	
EVEN	0		75		0		139		0		136		0		156		0		152		0		142		0		111	

Telephone: (510) 232-1271 *Fax: (510) 232-1272*

B A Y M E T R I C S

HST PROJECT - FRESNO

Date	15-Nov-09 Sunday				16-Nov-09 Monday				17-Nov-09 Tuesday				18-Nov-09 Wednesday				19-Nov-09 Thursday				20-Nov-09 Friday				21-Nov-09 Saturday			
Location	11. On Stanislaus Street, between Broadway Street and E Street																											
Direction	EB		WB		EB		WB		EB		WB		EB		WB		EB		WB		EB		WB		EB		WB	
TIME	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN
1200	0	0	35	0	0	0	28	0	0	0	19	0	0	0	22	0	0	0	22	0	0	0	22	0	0	0	28	0
1215	0	0	25	0	0	0	11	0	0	0	27	0	0	0	17	0	0	0	28	0	0	0	19	0	0	0	44	0
1230	0	0	27	0	0	0	20	0	0	0	20	0	0	0	18	0	0	0	17	0	0	0	17	0	0	0	22	0
1245	0	0	20	107	0	0	2	61	0	0	35	101	0	0	33	90	0	0	31	98	0	0	38	96	0	0	45	139
100	0	0	29	101	0	0	9	42	0	0	19	101	0	0	15	83	0	0	15	91	0	0	18	92	0	0	32	143
115	0	0	50	126	0	0	2	33	0	0	49	123	0	0	61	127	0	0	65	128	0	0	61	134	0	0	63	162
130	0	0	30	129	0	0	6	19	0	0	18	121	0	0	20	129	0	0	27	138	0	0	28	145	0	0	55	195
145	0	0	73	182	0	0	17	34	0	0	11	97	0	0	14	110	0	0	16	123	0	0	17	124	0	0	15	165
200	0	0	38	191	0	0	9	34	0	0	12	90	0	0	19	114	0	0	11	119	0	0	8	114	0	0	22	155
215	0	0	20	161	0	0	7	39	0	0	9	50	0	0	10	63	0	0	18	72	0	0	10	63	0	0	26	118
230	0	0	15	146	0	0	10	43	0	0	10	42	0	0	7	50	0	0	9	54	0	0	9	44	0	0	16	79
245	0	0	11	84	0	0	10	36	0	0	4	35	0	0	11	47	0	0	12	50	0	0	13	40	0	0	22	86
300	0	0	12	58	0	0	10	37	0	0	10	33	0	0	2	30	0	0	11	50	0	0	13	45	0	0	5	69
315	0	0	5	43	0	0	13	43	0	0	11	35	0	0	13	33	0	0	7	39	0	0	14	49	0	0	10	53
330	0	0	7	35	0	0	12	45	0	0	10	35	0	0	18	44	0	0	4	34	0	0	21	61	0	0	6	43
345	0	0	5	29	0	0	10	45	0	0	8	39	0	0	11	44	0	0	11	33	0	0	8	56	0	0	8	29
400	0	0	11	28	0	0	9	44	0	0	12	41	0	0	12	54	0	0	12	34	0	0	11	54	0	0	8	32
415	0	0	8	31	0	0	14	45	0	0	15	45	0	0	5	46	0	0	8	35	0	0	10	50	0	0	16	38
430	0	0	3	27	0	0	12	45	0	0	17	52	0	0	14	42	0	0	18	49	0	0	14	43	0	0	10	42
445	0	0	3	25	0	0	12	47	0	0	17	61	0	0	14	45	0	0	16	54	0	0	12	47	0	0	21	55
500	0	0	8	22	0	0	8	46	0	0	21	70	0	0	16	49	0	0	26	68	0	0	20	56	0	0	13	60
515	0	0	3	17	0	0	10	42	0	0	22	77	0	0	19	63	0	0	25	85	0	0	17	63	0	0	11	55
530	0	0	8	22	0	0	14	44	0	0	15	75	0	0	15	64	0	0	24	91	0	0	15	64	0	0	11	56
545	0	0	7	26	0	0	26	58	0	0	21	79	0	0	32	82	0	0	21	96	0	0	19	71	0	0	27	62
600	0	0	7	25	0	0	20	70	0	0	15	73	0	0	20	86	0	0	25	95	0	0	22	73	0	0	15	64
615	0	0	15	37	0	0	39	99	0	0	30	81	0	0	41	108	0	0	36	106	0	0	37	93	0	0	26	79
630	0	0	8	37	0	0	23	108	0	0	27	93	0	0	21	114	0	0	27	109	0	0	24	102	0	0	15	83
645	0	0	13	43	0	0	33	115	0	0	39	111	0	0	26	108	0	0	29	117	0	0	31	114	0	0	21	77
700	0	0	11	47	0	0	46	141	0	0	49	145	0	0	51	139	0	0	38	130	0	0	48	140	0	0	22	84
715	0	0	15	47	0	0	47	149	0	0	58	173	0	0	56	154	0	0	56	150	0	0	51	154	0	0	22	80
730	0	0	9	48	0	0	56	182	0	0	72	218	0	0	55	188	0	0	68	191	0	0	62	192	0	0	15	80
745	0	0	23	58	0	0	60	209	0	0	81	260	0	0	83	245	0	0	76	238	0	0	77	238	0	0	19	78
800	0	0	14	61	0	0	87	250	0	0	83	294	0	0	86	280	0	0	86	286	0	0	77	267	0	0	26	82
815	0	0	20	66	0	0	76	279	0	0	78	314	0	0	87	311	0	0	93	323	0	0	86	302	0	0	29	89
830	0	0	20	77	0	0	79	302	0	0	88	330	0	0	69	325	0	0	84	339	0	0	73	313	0	0	22	96
845	0	0	17	71	0	0	57	299	0	0	80	329	0	0	72	314	0	0	72	335	0	0	84	320	0	0	32	109
900	0	0	25	82	0	0	67	279	0	0	94	340	0	0	79	307	0	0	74	323	0	0	72	315	0	0	36	119
915	0	0	21	83	0	0	88	291	0	0	92	354	0	0	94	314	0	0	91	321	0	0	88	317	0	0	47	137
930	0	0	31	94	0	0	91	303	0	0	75	341	0	0	86	331	0	0	70	307	0	0	92	336	0	0	38	153
945	0	0	26	103	0	0	78	324	0	0	62	323	0	0	76	335	0	0	85	320	0	0	93	345	0	0	31	152
1000	0	0	33	111	0	0	89	346	0	0	87	316	0	0	115	371	0	0	96	342	0	0	76	349	0	0	41	157
1015	0	0	30	120	0	0	85	343	0	0	86	310	0	0	76	353	0	0	73	324	0	0	99	360	0	0	38	148
1030	0	0	38	127	0	0	108	360	0	0	88	323	0	0	102	369	0	0	88	342	0	0	100	368	0	0	65	175
1045	0	0	79	180	0	0	86	368	0	0	95	356	0	0	83	376	0	0	103	360	0	0	100	375	0	0	70	214
1100	0	0	59	206	0	0	99	378	0	0	101	370	0	0	95	356	0	0	129	393	0	0	95	394	0	0	51	224
1115	0	0	35	211	0	0	117	410	0	0	134	418	0	0	102	382	0	0	124	444	0	0	128	423	0	0	61	247
1130	0	0	43	216	0	0	120	422	0	0	123	453	0	0	94	374	0	0	100	456	0	0	162	485	0	0	71	253
1145	0	0	43	180	0	0	125	461	0	0	128	486	0	0	115	406	0	0	118	471	0	0	117	502	0	0	59	242
1200	0	0	39	160	0	0	117	479	0	0	126	511	0	0	109	420	0	0	120	462	0	0	112	519	0	0	51	242
1215	0	0	46	171	0	0	153	515	0	0	156	533	0	0	133	451	0	0	160	498	0	0	142	533	0	0	57	238
1230	0	0	53	181	0	0	108	503	0	0	99	509	0	0	117	474	0	0	111	509	0	0	126	497	0	0	48	215
1245	0	0	112	250	0	0	124	502	0	0	110	491	0	0	96	455	0	0	124	515	0	0	131	511	0	0	55	211
1300	0	0	74	285	0	0	122	507	0	0	125	490	0	0	100	446	0	0	118	513	0	0	118	517	0	0	67	227
1315	0	0	71	310	0	0	121	475	0	0	97	431	0	0	127	440	0	0	144	497	0	0	126	501	0	0	60	230
1330	0	0	59	316	0	0	111	478	0	0	110	442	0	0	106	429	0	0	123	509	0	0	127	502	0	0	79	261
1345	0	0	70	274	0	0	141	495	0	0	146	478	0	0	141	474	0	0	145	530	0	0	150	521	0	0	57	263
1400	0	0	49	249	0	0	120	493	0	0	107	460	0	0	114	488	0	0	118	530	0	0	125	528	0	0	73	269
1415	0	0	62	240	0	0	130	502	0	0	118	481	0	0	122	483	0	0	130	516	0	0	131	533	0	0	72	281
1430	0	0	45	226	0	0	114	505	0	0	142	513	0	0	138	515	0	0	139	532	0	0	118	524	0	0	67	269
1445	0	0	57	213	0	0	158	522	0	0	159	526	0	0	140	514	0	0	168	555	0	0	175	549	0	0	62	274
1500	0	0	38	202	0	0	121	523	0	0	118	537	0	0	126	526	0	0	141	578	0	0	143	567	0	0	68	269
1515	0	0	55	195	0	0	157	550	0	0	154	573	0	0	149	553	0	0	162	610	0	0	138	574	0	0	70	267
1530	0	0	52	202	0	0	127	563	0	0	123	554	0	0	159	574	0	0	120	591	0	0	143	599	0	0	67	267
1545	0	0	53	198	0	0	184	589	0	0	193	588	0	0	184	618	0	0	199	622	0	0	165	589	0	0	59	264
1600	0	0	37	197	0	0	148	616	0	0	164	634	0	0	136	628	0	0	147	628	0	0	150	596	0	0	56	252
1615	0	0	50	192	0	0	181	640	0	0	192	672	0	0	159	638	0	0	172	638	0	0	192	650	0	0	58	240
1630	0	0	48	188	0	0	162	675	0	0	157	706	0	0	162	641	0	0	167	685	0	0	158	665	0	0	70	243
1645	0	0	47	182	0	0	196	687	0	0	202	715	0	0	187	644	0	0	179	665	0	0	187	687	0	0	35	219
1700	0	0	57	202	0	0	184	723	0	0	170	721	0	0	152	660	0	0	172	690	0	0	162	699	0	0	61	224
1715	0	0	50	202	0	0	283	825	0	0	297	826	0	0	261	762	0	0	272	790	0	0	239	746	0	0	61	227
1730	0	0	56	210	0	0	205	868	0	0	196	865	0	0	177	777	0	0	160	783	0	0	192	780	0	0	59	216
1745	0	0	43	206	0	0	142	814	0	0	147	810	0	0	122	712	0	0	141	745	0	0	129	722	0	0	48	229
1800	0	0	39	188	0	0	100	730	0	0	108	748	0	0	126	686	0	0	111	684	0	0	107	667	0	0	40	208
1815	0	0	62	200	0	0	90	537	0	0	106	557	0	0	113	538	0	0	90	502	0	0	102	530	0	0	44	191
1830	0	0	42	186	0	0	76	408	0	0	88	449	0	0	72	433	0	0	85	427	0	0	86	424	0	0	45	177
1845	0	0	51	194	0	0	66	332	0	0	70	372	0	0	63	374	0	0	73	359	0	0	81	376	0	0	46	175
1900	0	0	36	191	0	0	59	291	0	0	58	322	0	0	71	319	0	0	57	305	0	0	69	338	0	0	44	179
1915	0	0	31	160	0	0	72	273	0	0	62	278	0	0	68	274	0	0	65	280	0	0	69	305	0	0	33	168
1930	0	0	18	136	0	0	41	238	0	0	62	252	0	0	50	252	0	0	56	251	0	0	56	275	0	0	30	153
1945	0	0	41	126	0	0	52	224	0	0	45	227	0	0	47	236	0	0	50	228	0	0	41	235	0	0	29	136
2000	0	0	26	116	0	0	45	210	0	0	71	240	0	0	47	212	0	0	46	217	0	0	43	209	0	0	25	117
2015	0	0	31	116	0	0	67	205	0	0	65	243	0	0	80	224	0	0	41	193	0	0	46	186	0	0	25	109
2030	0	0	23	121	0	0	42	206	0	0	74	255	0	0	74	248	0	0	59	196	0	0	45	175	0	0	32	111
2045	0	0	16	96	0	0	61	215	0	0	54	264	0	0	78	279	0	0	51	197	0	0	42	176	0	0	25	107
2100	0	0	19	89	0	0	36	206	0	0	36	229	0	0	45	277	0	0	48	199	0	0	37	170	0	0	18	100
2115	0	0	19	77	0	0	42	181	0	0	40	204	0	0	48	245	0	0	37	195	0	0	45	169	0	0	23	98
2130	0	0	18	72	0	0	30	169	0	0	33	163	0	0	37	208	0	0	34	170	0	0	32	156	0	0	28	94
2145	0	0	15	71	0	0	35	143	0	0	18	127	0	0	19	149	0	0	19	138	0	0	25	139	0	0	30	99
2200	0	0	17	69	0	0	29	136	0	0	29	120	0	0	25	129	0	0	30	120	0	0	31	133	0	0	42	123
2215	0	0	22	72	0	0	13	107	0	0	36	116	0	0	34	115	0	0	28	111	0	0	34	122	0	0	33	133
2230	0	0	20	74	0	0	22	99	0	0	21	104	0	0	21	99	0	0	35	112	0	0	21	111	0	0	76	181
2245	0	0	13	72	0	0	13	77	0	0	20	106	0	0	24	104	0	0	33	126	0	0	21	107	0	0	46	197
2300	0	0	11	66	0	0	17	65	0	0	24	101	0	0	21	100	0	0	17	113	0	0	31	107	0	0	27	182
2315	0	0	26	70	0	0	23	75	0	0	26	91	0	0	23	89	0	0	22	107	0	0	24	97	0	0	22	171
2330	0	0	19	69	0	0	16	69	0	0	18	88	0	0	19	87	0	0	27	99	0	0	32	108	0	0	26	121
2345	0	0	20	76	0	0	18	74	0	0	23	91	0	0	26	89	0	0	26	92	0	0	31	118	0	0	38	113
TOTAL	0	N/A	3,046	N/A	0	N/A	6,731	N/A	0	N/A	7,072	N/A	0	N/A	6,850	N/A	0	N/A	7,067	N/A	0	N/A	7,058	N/A	0	N/A	3,695	N/A
AM	0		103		0		324		0		354		0		335		0		339		0		345		0		153	
NOON	0		316		0		522		0		533		0		515		0		555		0		549		0		281	
PM	0		210		0		868		0		865		0		777		0		790		0		780		0		269	
EVEN	0		121		0		215		0		264		0		279		0		217		0		209		0		197	

Telephone: (510) 232-1271 Fax: (510) 232-1272

B A Y M E T R I C S

HST PROJECT - FRESNO

Date	15-Nov-09 Sunday				16-Nov-09 Monday				17-Nov-09 Tuesday				18-Nov-09 Wednesday				19-Nov-09 Thursday				20-Nov-09 Friday				21-Nov-09 Saturday			
Location	12. On Tuolumne Street, between Broadway Street and E Street																											
Direction	EB		WB		EB		WB		EB		WB		EB		WB		EB		WB		EB		WB		EB		WB	
TIME	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN
1200	12	0	0	0	10	0	0	0	8	0	0	0	13	0	0	0	10	0	0	0	9	0	0	0	25	0	0	0
1215	11	0	0	0	13	0	0	0	9	0	0	0	12	0	0	0	9	0	0	0	8	0	0	0	9	0	0	0
1230	7	0	0	0	7	0	0	0	10	0	0	0	4	0	0	0	11	0	0	0	13	0	0	0	11	0	0	0
1245	19	49	0	0	10	40	0	0	9	36	0	0	4	33	0	0	7	37	0	0	7	37	0	0	18	63	0	0
100	7	44	0	0	6	36	0	0	2	30	0	0	10	30	0	0	4	31	0	0	10	38	0	0	14	52	0	0
115	8	41	0	0	1	24	0	0	5	26	0	0	2	20	0	0	7	29	0	0	6	36	0	0	8	51	0	0
130	12	46	0	0	12	29	0	0	6	22	0	0	5	21	0	0	10	28	0	0	4	27	0	0	14	54	0	0
145	16	43	0	0	8	27	0	0	11	24	0	0	6	23	0	0	5	26	0	0	10	30	0	0	8	44	0	0
200	10	46	0	0	8	29	0	0	7	29	0	0	7	20	0	0	6	28	0	0	6	26	0	0	10	40	0	0
215	12	50	0	0	5	33	0	0	8	32	0	0	9	27	0	0	10	31	0	0	5	25	0	0	9	41	0	0
230	4	42	0	0	3	24	0	0	9	35	0	0	4	26	0	0	4	25	0	0	9	30	0	0	3	30	0	0
245	13	39	0	0	4	20	0	0	8	32	0	0	4	24	0	0	5	25	0	0	12	32	0	0	6	28	0	0
300	5	34	0	0	7	19	0	0	6	31	0	0	5	22	0	0	3	22	0	0	9	35	0	0	5	23	0	0
315	6	28	0	0	9	23	0	0	5	28	0	0	8	21	0	0	1	13	0	0	6	36	0	0	5	19	0	0
330	7	31	0	0	7	27	0	0	6	25	0	0	4	21	0	0	4	13	0	0	6	33	0	0	7	23	0	0
345	6	24	0	0	8	31	0	0	13	30	0	0	10	27	0	0	10	18	0	0	15	36	0	0	8	25	0	0
400	6	25	0	0	9	33	0	0	9	33	0	0	8	30	0	0	8	23	0	0	12	39	0	0	9	29	0	0
415	0	19	0	0	5	29	0	0	7	35	0	0	8	30	0	0	8	30	0	0	6	39	0	0	7	31	0	0
430	1	13	0	0	14	36	0	0	10	39	0	0	13	39	0	0	7	33	0	0	4	37	0	0	4	28	0	0
445	3	10	0	0	16	44	0	0	26	52	0	0	33	62	0	0	24	47	0	0	21	43	0	0	7	27	0	0
500	5	9	0	0	31	66	0	0	43	86	0	0	47	101	0	0	53	92	0	0	44	75	0	0	12	30	0	0
515	4	13	0	0	25	86	0	0	33	112	0	0	27	120	0	0	30	114	0	0	28	97	0	0	9	32	0	0
530	20	32	0	0	43	115	0	0	38	140	0	0	44	151	0	0	34	141	0	0	35	128	0	0	20	48	0	0
545	8	37	0	0	41	140	0	0	31	145	0	0	38	156	0	0	42	159	0	0	47	154	0	0	9	50	0	0
600	7	39	0	0	49	158	0	0	67	169	0	0	72	181	0	0	56	162	0	0	68	178	0	0	13	51	0	0
615	3	38	0	0	40	173	0	0	50	186	0	0	41	195	0	0	39	171	0	0	42	192	0	0	19	61	0	0
630	9	27	0	0	58	188	0	0	63	211	0	0	65	216	0	0	74	211	0	0	80	237	0	0	21	62	0	0
645	13	32	0	0	72	219	0	0	68	248	0	0	75	253	0	0	69	238	0	0	59	249	0	0	28	81	0	0
700	26	51	0	0	109	279	0	0	127	308	0	0	114	295	0	0	110	292	0	0	112	293	0	0	44	112	0	0
715	25	73	0	0	92	331	0	0	122	380	0	0	95	349	0	0	85	338	0	0	88	339	0	0	21	114	0	0
730	17	81	0	0	140	413	0	0	172	489	0	0	137	421	0	0	149	413	0	0	152	411	0	0	34	127	0	0
745	18	86	0	0	169	510	0	0	189	610	0	0	174	520	0	0	198	542	0	0	180	532	0	0	45	144	0	0
800	21	81	0	0	191	592	0	0	203	686	0	0	174	580	0	0	208	640	0	0	195	615	0	0	38	138	0	0
815	31	87	0	0	144	644	0	0	146	710	0	0	124	609	0	0	157	712	0	0	132	659	0	0	33	150	0	0
830	35	105	0	0	149	653	0	0	161	699	0	0	137	609	0	0	155	718	0	0	123	630	0	0	32	148	0	0
845	32	119	0	0	91	575	0	0	122	632	0	0	83	518	0	0	131	651	0	0	107	557	0	0	37	140	0	0
900	57	155	0	0	99	483	0	0	103	532	0	0	88	432	0	0	109	552	0	0	105	467	0	0	33	135	0	0
915	39	163	0	0	74	413	0	0	88	474	0	0	88	396	0	0	94	489	0	0	80	415	0	0	45	147	0	0
930	39	167	0	0	87	351	0	0	84	397	0	0	76	335	0	0	84	418	0	0	97	389	0	0	38	153	0	0
945	41	176	0	0	88	348	0	0	89	364	0	0	86	338	0	0	83	370	0	0	82	364	0	0	41	157	0	0
1000	44	163	0	0	85	334	0	0	91	352	0	0	71	321	0	0	95	356	0	0	85	344	0	0	48	172	0	0
1015	43	167	0	0	94	354	0	0	86	350	0	0	65	298	0	0	73	335	0	0	83	347	0	0	57	184	0	0
1030	41	169	0	0	74	341	0	0	78	344	0	0	74	296	0	0	72	323	0	0	77	327	0	0	34	180	0	0
1045	53	181	0	0	65	318	0	0	80	335	0	0	83	293	0	0	85	325	0	0	81	326	0	0	54	193	0	0
1100	58	195	0	0	72	305	0	0	77	321	0	0	70	292	0	0	82	312	0	0	78	319	0	0	52	197	0	0
1115	42	194	0	0	80	291	0	0	120	355	0	0	71	298	0	0	107	346	0	0	87	323	0	0	59	199	0	0
1130	47	200	0	0	91	308	0	0	80	357	0	0	76	300	0	0	81	355	0	0	79	325	0	0	39	204	0	0
1145	40	187	0	0	89	332	0	0	67	344	0	0	95	312	0	0	93	363	0	0	77	321	0	0	56	206	0	0
1200	52	181	0	0	104	364	0	0	89	356	0	0	86	328	0	0	92	373	0	0	75	318	0	0	42	196	0	0
1215	42	181	0	0	94	378	0	0	109	345	0	0	108	365	0	0	106	372	0	0	104	335	0	0	43	180	0	0
1230	41	175	0	0	85	372	0	0	87	352	0	0	88	377	0	0	80	371	0	0	90	346	0	0	44	185	0	0
1245	53	188	0	0	91	374	0	0	80	365	0	0	94	376	0	0	90	368	0	0	107	376	0	0	51	180	0	0
1300	44	180	0	0	114	384	0	0	90	366	0	0	86	376	0	0	109	385	0	0	98	399	0	0	45	183	0	0
1315	38	176	0	0	90	380	0	0	95	352	0	0	85	353	0	0	115	394	0	0	108	403	0	0	45	185	0	0
1330	42	177	0	0	91	386	0	0	79	344	0	0	80	345	0	0	107	421	0	0	89	402	0	0	58	199	0	0
1345	45	169	0	0	103	398	0	0	112	376	0	0	82	333	0	0	98	429	0	0	118	413	0	0	58	206	0	0
1400	38	163	0	0	85	369	0	0	69	355	0	0	63	310	0	0	95	415	0	0	96	411	0	0	46	207	0	0
1415	38	163	0	0	74	353	0	0	78	338	0	0	88	313	0	0	89	389	0	0	83	386	0	0	48	210	0	0
1430	45	166	0	0	82	344	0	0	87	346	0	0	84	317	0	0	110	392	0	0	99	396	0	0	39	191	0	0
1445	51	172	0	0	103	344	0	0	108	342	0	0	99	334	0	0	98	392	0	0	111	389	0	0	57	190	0	0
1500	49	183	0	0	82	341	0	0	94	367	0	0	92	363	0	0	108	405	0	0	99	392	0	0	46	190	0	0
1515	47	192	0	0	106	373	0	0	111	400	0	0	98	373	0	0	93	409	0	0	105	414	0	0	48	190	0	0
1530	35	182	0	0	99	390	0	0	124	437	0	0	110	399	0	0	103	402	0	0	104	419	0	0	48	199	0	0
1545	33	164	0	0	97	384	0	0	88	417	0	0	109	409	0	0	87	391	0	0	103	411	0	0	43	185	0	0
1600	42	157	0	0	85	387	0	0	108	431	0	0	84	401	0	0	91	374	0	0	98	410	0	0	57	196	0	0
1615	38	148	0	0	113	394	0	0	89	409	0	0	99	402	0	0	87	368	0	0	93	398	0	0	33	181	0	0
1630	36	149	0	0	88	383	0	0	113	398	0	0	92	384	0	0	72	337	0	0	110	404	0	0	42	175	0	0
1645	33	149	0	0	67	353	0	0	126	436	0	0	90	365	0	0	80	330	0	0	87	388	0	0	55	187	0	0
1700	36	143	0	0	89	357	0	0	101	429	0	0	83	364	0	0	86	325	0	0	112	402	0	0	36	166	0	0
1715	35	140	0	0	95	339	0	0	91	431	0	0	78	343	0	0	82	320	0	0	105	414	0	0	41	174	0	0
1730	37	141	0	0	88	339	0	0	117	435	0	0	89	340	0	0	108	356	0	0	89	393	0	0	63	195	0	0
1745	41	149	0	0	70	342	0	0	85	394	0	0	62	312	0	0	94	370	0	0	66	372	0	0	45	185	0	0
1800	26	139	0	0	55	308	0	0	63	356	0	0	64	293	0	0	50	334	0	0	62	322	0	0	46	195	0	0
1815	26	130	0	0	52	265	0	0	35	300	0	0	37	252	0	0	37	289	0	0	51	268	0	0	46	200	0	0
1830	31	124	0	0	36	213	0	0	41	224	0	0	44	207	0	0	39	220	0	0	47	226	0	0	32	169	0	0
1845	23	106	0	0	42	185	0	0	36	175	0	0	64	209	0	0	41	167	0	0	48	208	0	0	41	165	0	0
1900	40	120	0	0	33	163	0	0	52	164	0	0	46	191	0	0	51	168	0	0	45	191	0	0	39	158	0	0
1915	34	128	0	0	27	138	0	0	28	157	0	0	30	184	0	0	38	169	0	0	26	166	0	0	25	137	0	0
1930	25	122	0	0	26	128	0	0	38	154	0	0	26	166	0	0	25	155	0	0	25	144	0	0	29	134	0	0
1945	19	118	0	0	20	106	0	0	20	138	0	0	30	132	0	0	27	141	0	0	25	121	0	0	30	123	0	0
2000	16	94	0	0	20	93	0	0	32	118	0	0	29	115	0	0	26	116	0	0	28	104	0	0	31	115	0	0
2015	14	74	0	0	22	88	0	0	27	117	0	0	28	113	0	0	23	101	0	0	24	102	0	0	34	124	0	0
2030	15	64	0	0	22	84	0	0	27	106	0	0	18	105	0	0	15	91	0	0	34	111	0	0	28	123	0	0
2045	15	60	0	0	30	94	0	0	18	104	0	0	16	91	0	0	22	86	0	0	29	115	0	0	28	121	0	0
2100	16	60	0	0	20	94	0	0	32	104	0	0	16	78	0	0	22	82	0	0	32	119	0	0	48	138	0	0
2115	23	69	0	0	17	89	0	0	16	93	0	0	21	71	0	0	17	76	0	0	19	114	0	0	34	138	0	0
2130	15	69	0	0	13	80	0	0	20	86	0	0	17	70	0	0	18	79	0	0	20	100	0	0	34	144	0	0
2145	16	70	0	0	30	80	0	0	18	86	0	0	18	72	0	0	37	94	0	0	26	97	0	0	23	139	0	0
2200	11	65	0	0	11	71	0	0	14	68	0	0	15	71	0	0	13	85	0	0	28	93	0	0	30	121	0	0
2215	11	53	0	0	17	71	0	0	12	64	0	0	19	69	0	0	12	80	0	0	24	98	0	0	20	107	0	0
2230	11	49	0	0	10	68	0	0	10	54	0	0	14	66	0	0	15	77	0	0	29	107	0	0	19	92	0	0
2245	14	47	0	0	11	49	0	0	19	55	0	0	11	59	0	0	26	66	0	0	21	102	0	0	25	94	0	0
2300	11	47	0	0	18	56	0	0	15	56	0	0	21	65	0	0	17	70	0	0	21	95	0	0	17	81	0	0
2315	2	38	0	0	10	49	0	0	14	58	0	0	7	53	0	0	7	65	0	0	22	93	0	0	14	75	0	0
2330	5	32	0	0	11	50	0	0	11	59	0	0	10	49	0	0	5	55	0	0	23	87	0	0	19	75	0	0
2345	5	23	0	0	10	49	0	0	8	48	0	0	10	48	0	0	8	37	0	0	21	87	0	0	20	70	0	0
TOTAL	2,398	N/A	0	N/A	5,362	N/A	0	N/A	5,788	N/A	0	N/A	5,299	N/A	0	N/A	5,672	N/A	0	N/A	5,760	N/A	0	N/A	3,003	N/A	0	N/A
AM	176		0		653		0		710		0		609		0		718		0		659		0		157		0	
NOON	200		0		398		0		376		0		377		0		429		0		413		0		210		0	
PM	192		0		394		0		437		0		409		0		409		0		419		0		200		0	
EVEN	94		0		94		0		118		0		115		0		116		0		119		0		144		0	

Telephone: (510) 232-1271 *Fax: (510) 232-1272*

B A Y M E T R I C S

HST PROJECT - FRESNO

Date	15-Nov-09 Sunday				16-Nov-09 Monday				17-Nov-09 Tuesday				18-Nov-09 Wednesday				19-Nov-09 Thursday				20-Nov-09 Friday				21-Nov-09 Saturday			
Location	13. On Tuolumne Street, between Van Ness Avenue and O Street																											
Direction	EB		WB		EB		WB		EB		WB		EB		WB		EB		WB		EB		WB		EB		WB	
TIME	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN
1200	12	0	0	0	8	0	0	0	9	0	0	0	7	0	0	0	6	0	0	0	13	0	0	0	17	0	0	0
1215	12	0	0	0	9	0	0	0	5	0	0	0	6	0	0	0	7	0	0	0	11	0	0	0	7	0	0	0
1230	9	0	0	0	7	0	0	0	9	0	0	0	7	0	0	0	5	0	0	0	10	0	0	0	15	0	0	0
1245	11	44	0	0	6	30	0	0	14	37	0	0	13	33	0	0	12	30	0	0	10	44	0	0	14	53	0	0
100	6	38	0	0	4	26	0	0	3	31	0	0	3	29	0	0	4	28	0	0	9	40	0	0	12	48	0	0
115	5	31	0	0	0	17	0	0	22	48	0	0	20	43	0	0	17	38	0	0	15	44	0	0	24	65	0	0
130	12	34	0	0	2	12	0	0	4	43	0	0	5	41	0	0	7	40	0	0	4	38	0	0	8	58	0	0
145	18	41	0	0	0	6	0	0	5	34	0	0	4	32	0	0	3	31	0	0	5	33	0	0	5	49	0	0
200	11	46	0	0	1	3	0	0	3	34	0	0	3	32	0	0	3	30	0	0	2	26	0	0	5	42	0	0
215	15	56	0	0	2	5	0	0	3	15	0	0	5	17	0	0	8	21	0	0	2	13	0	0	2	20	0	0
230	2	46	0	0	1	4	0	0	3	14	0	0	2	14	0	0	2	16	0	0	6	15	0	0	3	15	0	0
245	6	34	0	0	2	6	0	0	1	10	0	0	3	13	0	0	4	17	0	0	3	13	0	0	3	13	0	0
300	4	27	0	0	3	8	0	0	1	8	0	0	2	12	0	0	3	17	0	0	2	13	0	0	0	8	0	0
315	4	16	0	0	2	8	0	0	6	11	0	0	3	10	0	0	1	10	0	0	6	17	0	0	1	7	0	0
330	4	18	0	0	3	10	0	0	1	9	0	0	0	8	0	0	0	8	0	0	2	13	0	0	3	7	0	0
345	4	16	0	0	4	12	0	0	7	15	0	0	5	10	0	0	4	8	0	0	5	15	0	0	3	7	0	0
400	2	14	0	0	5	14	0	0	4	18	0	0	4	12	0	0	4	9	0	0	7	20	0	0	1	8	0	0
415	0	10	0	0	0	12	0	0	0	12	0	0	2	11	0	0	3	11	0	0	2	16	0	0	5	12	0	0
430	0	6	0	0	4	13	0	0	6	17	0	0	4	15	0	0	3	14	0	0	1	15	0	0	3	12	0	0
445	4	6	0	0	8	17	0	0	4	14	0	0	5	15	0	0	5	15	0	0	5	15	0	0	3	12	0	0
500	3	7	0	0	8	20	0	0	13	23	0	0	15	26	0	0	16	27	0	0	14	22	0	0	5	16	0	0
515	2	9	0	0	14	34	0	0	14	37	0	0	13	37	0	0	13	37	0	0	16	36	0	0	5	16	0	0
530	18	27	0	0	22	52	0	0	21	52	0	0	15	48	0	0	10	44	0	0	21	56	0	0	15	28	0	0
545	8	31	0	0	22	66	0	0	12	60	0	0	17	60	0	0	22	61	0	0	18	69	0	0	13	38	0	0
600	6	34	0	0	7	65	0	0	12	59	0	0	11	56	0	0	11	56	0	0	11	66	0	0	7	40	0	0
615	5	37	0	0	15	66	0	0	18	63	0	0	13	56	0	0	9	52	0	0	15	65	0	0	4	39	0	0
630	7	26	0	0	22	66	0	0	28	70	0	0	32	73	0	0	35	77	0	0	39	83	0	0	18	42	0	0
645	7	25	0	0	43	87	0	0	38	96	0	0	37	93	0	0	37	92	0	0	36	101	0	0	19	48	0	0
700	19	38	0	0	51	131	0	0	63	147	0	0	61	143	0	0	59	140	0	0	54	144	0	0	24	65	0	0
715	11	44	0	0	67	183	0	0	59	188	0	0	53	183	0	0	48	179	0	0	61	190	0	0	23	84	0	0
730	8	45	0	0	80	241	0	0	86	246	0	0	77	228	0	0	69	213	0	0	74	225	0	0	23	89	0	0
745	12	50	0	0	105	303	0	0	131	339	0	0	134	325	0	0	138	314	0	0	133	322	0	0	26	96	0	0
800	13	44	0	0	126	378	0	0	148	424	0	0	147	411	0	0	146	401	0	0	139	407	0	0	15	87	0	0
815	29	62	0	0	103	414	0	0	109	474	0	0	109	467	0	0	109	462	0	0	107	453	0	0	19	83	0	0
830	23	77	0	0	97	431	0	0	128	516	0	0	121	511	0	0	114	507	0	0	96	475	0	0	32	92	0	0
845	12	77	0	0	84	410	0	0	97	482	0	0	93	470	0	0	89	458	0	0	86	428	0	0	34	100	0	0
900	20	84	0	0	65	349	0	0	78	412	0	0	79	402	0	0	80	392	0	0	86	375	0	0	35	120	0	0
915	27	82	0	0	63	309	0	0	82	385	0	0	77	370	0	0	71	354	0	0	57	325	0	0	28	129	0	0
930	21	80	0	0	88	300	0	0	69	326	0	0	69	318	0	0	70	310	0	0	61	290	0	0	34	131	0	0
945	20	88	0	0	70	286	0	0	69	298	0	0	59	284	0	0	50	271	0	0	63	267	0	0	35	132	0	0
1000	17	85	0	0	71	292	0	0	59	279	0	0	58	263	0	0	59	250	0	0	65	246	0	0	41	138	0	0
1015	26	84	0	0	63	292	0	0	67	264	0	0	61	247	0	0	55	234	0	0	76	265	0	0	35	145	0	0
1030	26	89	0	0	67	271	0	0	78	273	0	0	72	250	0	0	67	231	0	0	75	279	0	0	29	140	0	0
1045	48	117	0	0	62	263	0	0	71	275	0	0	62	253	0	0	53	234	0	0	69	285	0	0	40	145	0	0
1100	30	130	0	0	70	262	0	0	74	290	0	0	63	258	0	0	53	228	0	0	59	279	0	0	52	156	0	0
1115	26	130	0	0	72	271	0	0	117	340	0	0	66	263	0	0	71	244	0	0	76	279	0	0	25	146	0	0
1130	27	131	0	0	64	268	0	0	83	345	0	0	67	258	0	0	80	257	0	0	77	281	0	0	43	160	0	0
1145	28	111	0	0	71	277	0	0	67	341	0	0	73	269	0	0	75	279	0	0	77	289	0	0	25	145	0	0
1200	34	115	0	0	85	292	0	0	89	356	0	0	75	281	0	0	76	302	0	0	72	302	0	0	37	130	0	0
1215	37	126	0	0	86	306	0	0	86	325	0	0	70	285	0	0	88	319	0	0	93	319	0	0	28	133	0	0
1230	38	137	0	0	75	317	0	0	74	316	0	0	69	287	0	0	68	307	0	0	83	325	0	0	47	137	0	0
1245	66	175	0	0	74	320	0	0	66	315	0	0	79	293	0	0	83	315	0	0	88	336	0	0	29	141	0	0
1300	36	177	0	0	77	312	0	0	73	299	0	0	59	277	0	0	108	347	0	0	76	340	0	0	45	149	0	0
1315	31	171	0	0	75	301	0	0	86	299	0	0	87	294	0	0	96	355	0	0	82	329	0	0	42	163	0	0
1330	34	167	0	0	86	312	0	0	75	300	0	0	62	287	0	0	88	375	0	0	104	350	0	0	34	150	0	0
1345	43	144	0	0	99	337	0	0	91	325	0	0	69	277	0	0	89	381	0	0	93	355	0	0	51	172	0	0
1400	31	139	0	0	79	339	0	0	70	322	0	0	54	272	0	0	80	353	0	0	72	351	0	0	37	164	0	0
1415	31	139	0	0	67	331	0	0	67	303	0	0	68	253	0	0	80	337	0	0	77	346	0	0	36	158	0	0
1430	35	140	0	0	82	327	0	0	73	301	0	0	62	253	0	0	76	325	0	0	86	328	0	0	33	157	0	0
1445	30	127	0	0	93	321	0	0	98	308	0	0	75	259	0	0	95	331	0	0	95	330	0	0	41	147	0	0
1500	36	132	0	0	81	323	0	0	83	321	0	0	77	282	0	0	89	340	0	0	76	334	0	0	41	151	0	0
1515	32	133	0	0	89	345	0	0	98	352	0	0	76	290	0	0	90	350	0	0	84	341	0	0	39	154	0	0
1530	32	130	0	0	88	351	0	0	86	365	0	0	65	293	0	0	86	360	0	0	90	345	0	0	33	154	0	0
1545	25	125	0	0	69	327	0	0	94	361	0	0	78	296	0	0	87	352	0	0	78	328	0	0	31	144	0	0
1600	28	117	0	0	61	307	0	0	81	359	0	0	69	288	0	0	77	340	0	0	81	333	0	0	26	129	0	0
1615	22	107	0	0	93	311	0	0	95	356	0	0	84	296	0	0	71	321	0	0	69	318	0	0	33	123	0	0
1630	24	99	0	0	57	280	0	0	84	354	0	0	73	304	0	0	63	298	0	0	61	289	0	0	25	115	0	0
1645	33	107	0	0	53	264	0	0	106	366	0	0	68	294	0	0	86	297	0	0	74	285	0	0	31	115	0	0
1700	25	104	0	0	68	271	0	0	76	361	0	0	79	304	0	0	72	292	0	0	82	286	0	0	25	114	0	0
1715	25	107	0	0	108	286	0	0	103	369	0	0	97	317	0	0	96	317	0	0	98	315	0	0	41	122	0	0
1730	42	125	0	0	77	306	0	0	106	391	0	0	75	319	0	0	79	333	0	0	81	335	0	0	31	128	0	0
1745	28	120	0	0	77	330	0	0	74	359	0	0	70	321	0	0	80	327	0	0	66	327	0	0	32	129	0	0
1800	21	116	0	0	48	310	0	0	45	328	0	0	48	290	0	0	46	301	0	0	51	296	0	0	42	146	0	0
1815	21	112	0	0	48	250	0	0	37	262	0	0	31	224	0	0	34	239	0	0	30	228	0	0	28	133	0	0
1830	24	94	0	0	24	197	0	0	28	184	0	0	39	188	0	0	32	192	0	0	41	188	0	0	18	120	0	0
1845	22	88	0	0	36	156	0	0	36	146	0	0	35	153	0	0	30	142	0	0	29	151	0	0	23	111	0	0
1900	31	98	0	0	30	138	0	0	49	150	0	0	25	130	0	0	45	141	0	0	33	133	0	0	16	85	0	0
1915	21	98	0	0	20	110	0	0	26	139	0	0	25	124	0	0	24	131	0	0	21	124	0	0	25	82	0	0
1930	15	89	0	0	26	112	0	0	28	139	0	0	26	111	0	0	27	126	0	0	19	102	0	0	22	86	0	0
1945	19	86	0	0	28	104	0	0	20	123	0	0	33	109	0	0	23	119	0	0	15	88	0	0	25	88	0	0
2000	15	70	0	0	21	95	0	0	28	102	0	0	28	112	0	0	24	98	0	0	27	82	0	0	19	91	0	0
2015	14	63	0	0	18	93	0	0	18	94	0	0	31	118	0	0	18	92	0	0	17	78	0	0	20	86	0	0
2030	11	59	0	0	14	81	0	0	21	87	0	0	15	107	0	0	15	80	0	0	15	74	0	0	13	77	0	0
2045	12	52	0	0	17	70	0	0	21	88	0	0	17	91	0	0	17	74	0	0	24	83	0	0	9	61	0	0
2100	15	52	0	0	13	62	0	0	21	81	0	0	12	75	0	0	11	61	0	0	16	72	0	0	20	62	0	0
2115	13	51	0	0	17	61	0	0	16	79	0	0	15	59	0	0	18	61	0	0	16	71	0	0	23	65	0	0
2130	18	58	0	0	14	61	0	0	16	74	0	0	18	62	0	0	10	56	0	0	23	79	0	0	22	74	0	0
2145	7	53	0	0	21	65	0	0	17	70	0	0	9	54	0	0	27	66	0	0	21	76	0	0	14	79	0	0
2200	9	47	0	0	12	64	0	0	10	59	0	0	10	52	0	0	11	66	0	0	14	74	0	0	11	70	0	0
2215	11	45	0	0	10	57	0	0	13	56	0	0	11	48	0	0	12	60	0	0	13	71	0	0	14	61	0	0
2230	9	36	0	0	9	52	0	0	4	44	0	0	13	43	0	0	11	61	0	0	10	58	0	0	17	56	0	0
2245	9	38	0	0	14	45	0	0	18	45	0	0	7	41	0	0	16	50	0	0	12	49	0	0	16	58	0	0
2300	8	37	0	0	11	44	0	0	6	41	0	0	12	43	0	0	16	55	0	0	10	45	0	0	9	56	0	0
2315	4	30	0	0	5	39	0	0	10	38	0	0	4	36	0	0	4	47	0	0	7	39	0	0	15	57	0	0
2330	4	25	0	0	8	38	0	0	3	37	0	0	5	28	0	0	1	37	0	0	14	43	0	0	16	56	0	0
2345	3	19	0	0	4	28	0	0	8	27	0	0	6	27	0	0	5	26	0	0	9	40	0	0	7	47	0	0
TOTAL	1,774	N/A	0	N/A	4,130	N/A	0	N/A	4,534	N/A	0	N/A	4,072	N/A	0	N/A	4,290	N/A	0	N/A	4,329	N/A	0	N/A	2,130	N/A	0	N/A
AM	88		0		431		0		516		0		511		0		507		0		475		0		132		0	
NOON	177		0		339		0		356		0		294		0		381		0		355		0		172		0	
PM	133		0		351		0		391		0		321		0		360		0		345		0		154		0	
EVEN	70		0		95		0		102		0		118		0		98		0		83		0		91		0	

Telephone: (510) 232-1271 *Fax: (510) 232-1272*

Data File: 'Fresno_WO_Fulton_EB_032509.rdf'
Site Code: '000000000000'
Start Date: 3/26/2009
Start Time: 12:00 AM
Sensor Layout: '11'

'LOCATION': 'Fresno'
'CROSS ST': 'W/O Fulton'
'COUNT': 'Downtown Study'

thursday			Friday			Saturday			Sunday		
Date	Time	EB									
3/26/2009	12:00 AM	43	3/27/2009	12:00 AM	43	3/28/2009	12:00 AM	90	3/29/2009	12:00 AM	101
3/26/2009	1:00 AM	36	3/27/2009	1:00 AM	36	3/28/2009	1:00 AM	64	3/29/2009	1:00 AM	62
3/26/2009	2:00 AM	34	3/27/2009	2:00 AM	17	3/28/2009	2:00 AM	31	3/29/2009	2:00 AM	47
3/26/2009	3:00 AM	22	3/27/2009	3:00 AM	19	3/28/2009	3:00 AM	25	3/29/2009	3:00 AM	21
3/26/2009	4:00 AM	18	3/27/2009	4:00 AM	23	3/28/2009	4:00 AM	20	3/29/2009	4:00 AM	15
3/26/2009	5:00 AM	71	3/27/2009	5:00 AM	76	3/28/2009	5:00 AM	30	3/29/2009	5:00 AM	37
3/26/2009	6:00 AM	180	3/27/2009	6:00 AM	177	3/28/2009	6:00 AM	76	3/29/2009	6:00 AM	61
3/26/2009	7:00 AM	417	3/27/2009	7:00 AM	418	3/28/2009	7:00 AM	110	3/29/2009	7:00 AM	74
3/26/2009	8:00 AM	533	3/27/2009	8:00 AM	554	3/28/2009	8:00 AM	158	3/29/2009	8:00 AM	98
3/26/2009	9:00 AM	540	3/27/2009	9:00 AM	566	3/28/2009	9:00 AM	218	3/29/2009	9:00 AM	134
3/26/2009	10:00 AM	525	3/27/2009	10:00 AM	523	3/28/2009	10:00 AM	273	3/29/2009	10:00 AM	198
3/26/2009	11:00 AM	549	3/27/2009	11:00 AM	608	3/28/2009	11:00 AM	291	3/29/2009	11:00 AM	269
3/26/2009	12:00 PM	611	3/27/2009	12:00 PM	674	3/28/2009	12:00 PM	297	3/29/2009	12:00 PM	295
3/26/2009	1:00 PM	582	3/27/2009	1:00 PM	613	3/28/2009	1:00 PM	321	3/29/2009	1:00 PM	315
3/26/2009	2:00 PM	545	3/27/2009	2:00 PM	635	3/28/2009	2:00 PM	280	3/29/2009	2:00 PM	266
3/26/2009	3:00 PM	526	3/27/2009	3:00 PM	558	3/28/2009	3:00 PM	259	3/29/2009	3:00 PM	235
3/26/2009	4:00 PM	536	3/27/2009	4:00 PM	503	3/28/2009	4:00 PM	218	3/29/2009	4:00 PM	175
3/26/2009	5:00 PM	414	3/27/2009	5:00 PM	477	3/28/2009	5:00 PM	212	3/29/2009	5:00 PM	191
3/26/2009	6:00 PM	257	3/27/2009	6:00 PM	248	3/28/2009	6:00 PM	215	3/29/2009	6:00 PM	168
3/26/2009	7:00 PM	193	3/27/2009	7:00 PM	272	3/28/2009	7:00 PM	168	3/29/2009	7:00 PM	117
3/26/2009	8:00 PM	136	3/27/2009	8:00 PM	186	3/28/2009	8:00 PM	132	3/29/2009	8:00 PM	108
3/26/2009	9:00 PM	102	3/27/2009	9:00 PM	139	3/28/2009	9:00 PM	129	3/29/2009	9:00 PM	100
3/26/2009	10:00 PM	99	3/27/2009	10:00 PM	153	3/28/2009	10:00 PM	151	3/29/2009	10:00 PM	67
3/26/2009	11:00 PM	64	3/27/2009	11:00 PM	121	3/28/2009	11:00 PM	126	3/29/2009	11:00 PM	55
		7,033			7,639			3,894			3,209

Data File: 'Fresno_WO_Fulton_WB_031809.rdf'
Site Code: '000000000000'
Start Date: 3/19/2009
Start Time: 12:00 AM
Sensor Layout: '21'

'LOCATION': 'Fresno'
'CROSS ST': 'W/O Fulton'
'COUNT': 'Downtown Study'

Thursday			Friday			Saturday			Sunday		
Date	Time	WB	Date	Time	WB	Date	Time	WB	Date	Time	WB
3/19/2009	12:00 AM	58	3/20/2009	12:00 AM	55	3/21/2009	12:00 AM	102	3/22/2009	12:00 AM	90
3/19/2009	1:00 AM	80	3/20/2009	1:00 AM	102	3/21/2009	1:00 AM	139	3/22/2009	1:00 AM	124
3/19/2009	2:00 AM	26	3/20/2009	2:00 AM	30	3/21/2009	2:00 AM	37	3/22/2009	2:00 AM	61
3/19/2009	3:00 AM	13	3/20/2009	3:00 AM	15	3/21/2009	3:00 AM	29	3/22/2009	3:00 AM	27
3/19/2009	4:00 AM	21	3/20/2009	4:00 AM	9	3/21/2009	4:00 AM	17	3/22/2009	4:00 AM	28
3/19/2009	5:00 AM	54	3/20/2009	5:00 AM	59	3/21/2009	5:00 AM	36	3/22/2009	5:00 AM	21
3/19/2009	6:00 AM	106	3/20/2009	6:00 AM	92	3/21/2009	6:00 AM	64	3/22/2009	6:00 AM	43
3/19/2009	7:00 AM	232	3/20/2009	7:00 AM	256	3/21/2009	7:00 AM	108	3/22/2009	7:00 AM	66
3/19/2009	8:00 AM	373	3/20/2009	8:00 AM	342	3/21/2009	8:00 AM	151	3/22/2009	8:00 AM	92
3/19/2009	9:00 AM	414	3/20/2009	9:00 AM	434	3/21/2009	9:00 AM	252	3/22/2009	9:00 AM	157
3/19/2009	10:00 AM	487	3/20/2009	10:00 AM	507	3/21/2009	10:00 AM	309	3/22/2009	10:00 AM	176
3/19/2009	11:00 AM	553	3/20/2009	11:00 AM	566	3/21/2009	11:00 AM	317	3/22/2009	11:00 AM	218
3/19/2009	12:00 PM	572	3/20/2009	12:00 PM	587	3/21/2009	12:00 PM	350	3/22/2009	12:00 PM	293
3/19/2009	1:00 PM	617	3/20/2009	1:00 PM	631	3/21/2009	1:00 PM	303	3/22/2009	1:00 PM	289
3/19/2009	2:00 PM	603	3/20/2009	2:00 PM	676	3/21/2009	2:00 PM	344	3/22/2009	2:00 PM	259
3/19/2009	3:00 PM	557	3/20/2009	3:00 PM	654	3/21/2009	3:00 PM	324	3/22/2009	3:00 PM	301
3/19/2009	4:00 PM	580	3/20/2009	4:00 PM	624	3/21/2009	4:00 PM	271	3/22/2009	4:00 PM	250
3/19/2009	5:00 PM	516	3/20/2009	5:00 PM	560	3/21/2009	5:00 PM	233	3/22/2009	5:00 PM	224
3/19/2009	6:00 PM	241	3/20/2009	6:00 PM	328	3/21/2009	6:00 PM	177	3/22/2009	6:00 PM	189
3/19/2009	7:00 PM	187	3/20/2009	7:00 PM	221	3/21/2009	7:00 PM	175	3/22/2009	7:00 PM	158
3/19/2009	8:00 PM	166	3/20/2009	8:00 PM	205	3/21/2009	8:00 PM	175	3/22/2009	8:00 PM	156
3/19/2009	9:00 PM	136	3/20/2009	9:00 PM	166	3/21/2009	9:00 PM	146	3/22/2009	9:00 PM	89
3/19/2009	10:00 PM	114	3/20/2009	10:00 PM	141	3/21/2009	10:00 PM	126	3/22/2009	10:00 PM	84
3/19/2009	11:00 PM	96	3/20/2009	11:00 PM	128	3/21/2009	11:00 PM	108	3/22/2009	11:00 PM	59
		6,802			7,388			4,293			3,454

B A Y M E T R I C S

HST PROJECT - FRESNO

Date	15-Nov-09 Sunday				16-Nov-09 Monday				17-Nov-09 Tuesday				18-Nov-09 Wednesday				19-Nov-09 Thursday				20-Nov-09 Friday				21-Nov-09 Saturday			
Location	15. On Fresno Street, between M Street and Van Ness Avenue																											
Direction	EB		WB		EB		WB		EB		WB		EB		WB		EB		WB		EB		WB		EB		WB	
TIME	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN
1200	19	0	14	0	18	0	12	0	10	0	7	0	14	0	15	0	10	0	11	0	11	0	13	0	15	0	21	0
1215	20	0	19	0	13	0	8	0	17	0	9	0	18	0	9	0	13	0	3	0	18	0	8	0	24	0	13	0
1230	16	0	15	0	10	0	7	0	17	0	6	0	9	0	7	0	10	0	6	0	7	0	3	0	22	0	21	0
1245	16	71	14	62	12	53	7	34	7	51	6	28	10	51	6	37	6	39	9	29	7	43	5	29	18	79	16	71
100	10	62	13	61	12	47	9	31	11	52	6	27	6	43	6	28	9	38	4	22	8	40	5	21	18	82	10	60
115	9	51	8	50	5	39	8	31	11	46	6	24	11	36	10	29	15	40	9	28	14	36	5	18	18	76	16	63
130	11	46	7	42	6	35	9	33	3	32	2	20	7	34	3	25	8	38	3	25	15	44	9	24	17	71	9	51
145	24	54	13	41	9	32	6	32	7	32	9	23	7	31	5	24	13	45	6	22	12	49	3	22	12	65	9	44
200	18	62	9	37	3	23	6	29	8	29	5	22	6	31	6	24	9	45	6	24	6	47	4	21	15	62	7	41
215	22	75	7	36	14	32	7	28	10	28	6	22	11	31	12	26	8	38	6	21	10	43	5	21	11	55	8	33
230	32	96	9	38	9	35	5	24	5	30	8	28	7	31	7	30	9	39	8	26	7	35	4	16	8	46	9	33
245	17	89	6	31	2	28	6	24	7	30	7	26	5	29	6	31	5	31	5	25	8	31	3	16	13	47	2	26
300	15	86	9	31	6	31	4	22	10	32	4	25	2	25	2	27	3	25	7	26	9	34	8	20	8	40	4	23
315	7	71	6	30	6	23	2	17	8	30	7	26	5	19	3	18	6	23	3	23	19	43	3	18	5	34	1	16
330	8	47	7	28	1	15	8	20	3	28	6	24	7	19	7	18	6	20	9	24	4	40	7	21	10	36	5	12
345	9	39	6	28	5	18	4	18	4	25	7	24	2	16	6	18	3	18	4	23	4	36	3	21	18	41	4	14
400	7	31	10	29	3	15	8	22	4	19	5	25	2	16	7	23	5	20	2	18	0	27	6	19	6	39	6	16
415	6	30	3	26	5	14	7	27	3	14	5	23	8	19	5	25	6	20	2	17	7	15	1	17	11	45	3	18
430	2	24	4	23	3	16	10	29	5	16	8	25	5	17	7	25	5	19	4	12	6	17	4	14	6	41	3	16
445	2	17	5	22	9	20	6	31	6	18	12	30	13	28	9	28	8	24	5	13	7	20	5	16	10	33	7	19
500	6	16	4	16	7	24	6	29	9	23	10	35	3	29	8	29	3	22	16	27	5	25	13	23	11	38	4	17
515	3	13	5	18	4	23	15	37	4	24	5	35	9	30	5	29	6	22	5	30	4	22	9	31	7	34	4	18
530	7	18	5	19	12	32	14	41	6	25	11	38	5	30	9	31	7	24	10	36	7	23	8	35	6	34	4	19
545	7	23	13	27	13	36	22	57	18	37	16	42	11	28	20	42	8	24	20	51	13	29	14	44	11	35	16	28
600	15	32	11	34	19	48	18	69	16	44	13	45	19	44	13	47	19	40	17	52	18	42	13	44	9	33	10	34
615	12	41	7	36	30	74	18	72	25	65	25	65	25	60	30	72	20	54	21	68	21	59	21	56	17	43	8	38
630	12	46	7	38	18	80	24	82	23	82	18	72	27	82	21	84	27	74	24	82	27	79	23	71	17	54	11	45
645	20	59	8	33	58	125	36	96	38	102	27	83	46	117	35	99	35	101	30	92	41	107	26	83	13	56	17	46
700	22	66	18	40	51	157	37	115	42	128	41	111	44	142	55	141	56	138	47	122	56	145	36	106	32	79	18	54
715	19	73	17	50	58	185	54	151	61	164	53	139	66	183	54	165	51	169	37	138	54	178	35	120	22	84	21	67
730	19	80	22	65	82	249	55	182	71	212	61	182	71	227	53	197	98	240	68	182	68	219	64	161	23	90	22	78
745	16	76	19	76	118	309	83	229	104	278	64	219	92	273	73	235	79	284	68	220	81	259	78	213	38	115	45	106
800	14	68	13	71	111	369	97	289	109	345	90	268	105	334	83	263	103	331	101	274	105	308	86	263	41	124	25	113
815	20	69	15	69	124	435	60	295	123	407	93	308	90	358	93	302	102	382	90	327	107	361	93	321	26	128	38	130
830	19	69	17	64	146	499	107	347	132	468	98	345	101	388	64	313	117	401	67	326	108	401	92	349	25	130	45	153
845	26	79	23	68	130	511	111	375	138	502	96	377	104	400	80	320	135	457	114	372	100	420	94	365	36	128	41	149
900	33	98	40	95	137	537	91	369	141	534	117	404	116	411	80	317	131	485	99	370	127	442	88	367	31	118	45	169
915	37	115	20	100	135	548	97	406	151	562	96	407	97	418	70	294	156	539	116	396	117	452	82	356	34	126	44	175
930	45	141	35	118	132	534	102	401	120	550	103	412	110	427	93	323	136	558	97	426	97	441	118	382	38	139	74	204
945	33	148	28	123	130	534	133	423	142	554	101	417	106	429	102	345	121	544	102	414	117	458	82	370	47	150	62	225
1000	37	152	42	125	122	519	128	460	121	534	124	424	93	406	110	375	126	539	115	430	115	446	102	384	45	164	50	230
1015	44	159	29	134	150	534	92	455	138	521	86	414	88	397	83	388	164	547	130	444	115	444	114	416	51	181	54	240
1030	33	147	49	148	144	546	119	472	146	547	136	447	91	378	94	389	134	545	101	448	139	486	107	405	58	201	59	225
1045	38	152	42	162	132	548	100	439	167	572	125	471	109	381	93	380	135	559	116	462	122	491	101	424	57	211	65	228
1100	38	153	58	178	142	568	106	417	135	586	125	472	106	394	101	371	158	591	108	455	128	504	133	455	57	223	48	226
1115	42	151	44	193	143	561	132	457	135	583	132	518	109	415	109	397	156	583	123	448	121	510	115	456	64	236	68	240
1130	66	184	37	181	141	558	131	469	152	589	135	517	98	422	93	396	156	605	118	465	137	508	135	484	53	231	69	250
1145	53	199	66	205	179	605	116	485	153	575	115	507	116	429	121	424	146	616	133	482	116	502	147	530	74	248	76	261
1200	43	204	62	209	157	620	132	511	132	572	139	521	133	456	108	431	123	581	146	520	135	509	131	528	45	236	73	286
1215	58	220	56	221	153	630	146	525	156	593	126	515	132	479	114	436	133	558	122	519	135	523	132	545	56	228	68	286
1230	42	196	53	237	147	636	117	511	147	588	96	476	131	512	115	458	144	546	107	508	138	524	135	545	55	230	71	288
1245	48	191	61	232	132	589	110	505	120	555	147	508	127	523	101	438	139	539	111	486	133	541	103	501	60	216	61	273
1300	68	216	58	228	146	578	174	547	134	557	121	490	115	505	116	446	154	570	133	473	128	534	161	531	66	237	61	261
1315	54	212	58	230	152	577	122	523	147	548	130	494	120	493	90	422	160	597	114	465	128	527	104	503	60	241	73	266
1330	82	252	73	250	166	596	140	546	149	550	121	519	103	465	120	427	126	579	118	476	112	501	151	519	63	249	76	271
1345	58	262	64	253	150	614	130	566	128	558	129	501	117	455	112	438	134	574	140	505	138	506	121	537	63	252	65	275
1400	67	261	59	254	137	605	133	525	128	552	118	498	162	502	108	430	122	542	89	461	142	520	108	484	66	252	83	297
1415	60	267	55	251	158	611	122	525	127	532	114	482	150	532	111	451	130	512	118	465	134	526	117	497	66	258	75	299
1430	50	235	65	243	152	597	141	526	134	517	144	505	155	584	91	422	128	514	96	443	132	546	118	464	70	265	61	284
1445	67	244	65	244	157	604	126	522	160	549	124	500	123	590	127	437	158	538	129	432	117	525	112	455	67	269	44	263
1500	77	254	75	260	143	610	132	521	142	563	117	499	109	537	115	444	142	558	128	471	115	498	124	471	65	268	57	237
1515	65	259	56	261	139	591	126	525	130	566	140	525	113	500	120	453	126	554	141	494	122	486	133	487	51	253	87	249
1530	55	264	58	254	159	598	141	525	131	563	108	489	119	464	113	475	154	580	132	530	121	475	121	490	51	234	52	240
1545	42	239	45	234	129	570	151	550	122	525	141	506	114	455	113	461	138	560	116	517	113	471	134	512	51	218	65	261
1600	48	210	41	200	153	580	124	542	119	502	114	503	110	456	105	451	144	562	113	502	125	481	145	533	51	204	56	260
1615	57	202	67	211	149	590	130	546	127	499	94	457	110	453	113	444	125	561	98	459	104	463	136	536	64	217	48	221
1630	53	200	45	198	120	551	97	502	125	493	104	453	110	444	95	426	127	534	102	429	101	443	114	529	62	228	52	221
1645	60	218	41	194	142	564	106	457	181	552	106	418	138	468	120	433	148	544	116	429	136	466	100	495	51	228	39	195
1700	44	214	41	194	129	540	111	444	120	553	102	406	109	467	103	431	106	506	117	433	113	454	102	452	48	225	51	190
1715	47	204	42	169	150	541	120	434	143	569	104	416	120	477	113	431	155	536	129	464	161	511	134	450	43	204	43	185
1730	32	183	50	174	105	526	101	438	128	572	96	408	126	493	104	440	105	514	75	437	134	544	88	424	57	199	40	173
1745	27	150	35	168	97	481	101	433	69	460	77	379	96	451	74	394	107	473	91	412	77	485	78	402	48	196	35	169
1800	26	132	35	162	60	412	70	392	70	410	72	349	85	427	70	361	77	444	58	353	90	462	84	384	46	194	42	160
1815	39	124	36	156	51	313	55	327	52	319	88	333	73	380	53	301	75	364	95	319	74	375	48	298	47	198	45	162
1830	30	122	46	152	49	257	44	270	61	252	56	293	50	304	53	250	46	305	62	306	46	287	47	257	42	183	39	161
1845	39	134	34	151	35	195	51	220	47	230	53	269	45	253	53	229	57	255	54	269	55	265	65	244	44	179	51	177
1900	32	140	42	158	39	174	54	204	47	207	66	263	41	209	46	205	63	241	46	257	59	234	69	229	55	188	34	169
1915	25	126	40	162	39	162	48	197	47	202	51	226	48	184	44	196	28	194	45	207	43	203	56	237	33	174	46	170
1930	22	118	42	158	35	148	46	199	37	178	56	226	39	173	32	175	28	176	48	193	46	203	49	239	30	162	37	168
1945	22	101	45	169	22	135	37	185	36	167	44	217	26	154	33	155	31	150	52	191	44	192	44	218	29	147	35	152
2000	19	88	40	167	28	124	37	168	26	146	42	193	37	150	32	141	42	129	38	183	29	162	45	194	29	121	49	167
2015	26	89	44	171	37	122	34	154	29	128	39	181	25	127	35	132	32	133	34	172	32	151	47	185	36	124	35	156
2030	23	90	39	168	34	121	34	142	32	123	31	156	31	119	43	143	27	132	36	160	30	135	41	177	25	119	19	138
2045	26	94	24	147	24	123	31	136	39	126	30	142	30	123	43	153	24	125	28	136	37	128	31	164	41	131	32	135
2100	24	99	25	132	28	123	28	127	23	123	28	128	27	113	29	150	27	110	31	129	25	124	30	149	36	138	42	128
2115	16	89	18	106	34	120	22	115	17	111	33	122	29	117	25	140	22	100	26	121	31	123	18	120	25	127	35	128
2130	20	86	28	95	27	113	27	108	24	103	30	121	22	108	28	125	27	100	30	115	37	130	39	118	25	127	27	136
2145	22	82	15	86	28	117	13	90	10	74	25	116	28	106	30	112	26	102	16	103	18	111	31	118	25	111	26	130
2200	16	74	17	78	17	106	18	80	20	71	21	109	23	102	17	100	8	83	17	89	23	109	32	120	47	122	21	109
2215	24	82	13	73	20	92	17	75	18	72	16	92	22	95	18	93	17	78	20	83	30	108	19	121	32	129	26	100
2230	11	73	17	62	15	80	15	63	13	61	13	75	13	86	15	80	16	67	20	73	28	99	18	100	39	143	26	99
2245	24	75	11	58	15	67	8	58	16	67	11	61	21	79	22	72	12	53	19	76	26	107	26	95	21	139	17	90
2300	16	75	9	50	19	69	18	58	13	60	17	57	14	70	19	74	14	59	20	79	18	102	27	90	25	117	17	86
2315	28	79	12	49	11	60	18	59	11	53	13	54	13	61	15	71	20	62	14	73	28	100	18	89	33	118	20	80
2330	31	99	16	48	20	65	15	59	14	54	18	59	18	66	16	72	13	59	14	67	25	97	18	89	34	113	12	66
2345	18	93	19	56	16	66	13	64	13	51	15	63	12	57	19	69	9	56	12	60	25	96	15	78	28	120	23	72
TOTAL	2,889	N/A	2,870	N/A	6,944	N/A	6,029	N/A	6,690	N/A	5,927	N/A	5,926	N/A	5,374	N/A	6,711	N/A	5,821	N/A	6,338	N/A	5,952	N/A	3,414	N/A	3,409	N/A
AM	148		123		548		423		562		417		429		345		558		426		458		382		150		225	
NOON	267		254		636		566		593		521		590		458		616		520		546		545		269		299	
PM	264		261		610		550		572		525		537		475		580		530		544		536		268		261	
EVEN	99		171		124		168		146		193		150		153		133		183		162		194		143		167	

Telephone: (510) 232-1271 *Fax: (510) 232-1272*

Data File: 'Tulare_WO_Fulton_031809.rdf'
Site Code: '000000000000'
Start Date: 3/19/2009
Start Time: 12:00 AM
Sensor Layout: '21'

'LOCATION': 'Tulare'
'CROSS ST': 'W/O Fulton'
'COUNT': 'Downtown Study'

Thursday					Friday					Saturday					Sunday				
Date	Time	Total	**EB**	**WB**	Date	Time	Total	**EB**	**WB**	Date	Time	Total	**EB**	**WB**	Date	Time	Total	**EB**	**WB**
3/19/2009	12:00 AM	54	24	30	3/20/2009	12:00 AM	38	20	18	3/21/2009	12:00 AM	72	37	35	3/22/2009	12:00 AM	63	32	31
3/19/2009	1:00 AM	34	19	15	3/20/2009	1:00 AM	46	22	24	3/21/2009	1:00 AM	67	32	35	3/22/2009	1:00 AM	57	32	25
3/19/2009	2:00 AM	20	9	11	3/20/2009	2:00 AM	16	8	8	3/21/2009	2:00 AM	38	25	13	3/22/2009	2:00 AM	40	23	17
3/19/2009	3:00 AM	18	7	11	3/20/2009	3:00 AM	14	9	5	3/21/2009	3:00 AM	24	10	14	3/22/2009	3:00 AM	21	10	11
3/19/2009	4:00 AM	19	9	10	3/20/2009	4:00 AM	23	13	10	3/21/2009	4:00 AM	22	9	13	3/22/2009	4:00 AM	13	5	8
3/19/2009	5:00 AM	105	58	47	3/20/2009	5:00 AM	94	56	38	3/21/2009	5:00 AM	58	35	23	3/22/2009	5:00 AM	24	11	13
3/19/2009	6:00 AM	156	101	55	3/20/2009	6:00 AM	162	103	59	3/21/2009	6:00 AM	93	56	37	3/22/2009	6:00 AM	47	27	20
3/19/2009	7:00 AM	448	296	152	3/20/2009	7:00 AM	483	321	162	3/21/2009	7:00 AM	148	94	54	3/22/2009	7:00 AM	108	71	37
3/19/2009	8:00 AM	589	331	258	3/20/2009	8:00 AM	535	335	200	3/21/2009	8:00 AM	213	121	92	3/22/2009	8:00 AM	127	58	69
3/19/2009	9:00 AM	518	297	221	3/20/2009	9:00 AM	564	314	250	3/21/2009	9:00 AM	335	194	141	3/22/2009	9:00 AM	207	114	93
3/19/2009	10:00 AM	655	357	298	3/20/2009	10:00 AM	761	407	354	3/21/2009	10:00 AM	400	230	170	3/22/2009	10:00 AM	240	140	100
3/19/2009	11:00 AM	776	433	343	3/20/2009	11:00 AM	825	430	395	3/21/2009	11:00 AM	483	271	212	3/22/2009	11:00 AM	357	183	174
3/19/2009	12:00 PM	810	434	376	3/20/2009	12:00 PM	826	420	406	3/21/2009	12:00 PM	535	325	210	3/22/2009	12:00 PM	389	210	179
3/19/2009	1:00 PM	769	423	346	3/20/2009	1:00 PM	819	453	366	3/21/2009	1:00 PM	538	309	229	3/22/2009	1:00 PM	422	227	195
3/19/2009	2:00 PM	755	408	347	3/20/2009	2:00 PM	854	456	398	3/21/2009	2:00 PM	455	244	211	3/22/2009	2:00 PM	396	211	185
3/19/2009	3:00 PM	726	383	343	3/20/2009	3:00 PM	789	410	379	3/21/2009	3:00 PM	431	260	171	3/22/2009	3:00 PM	354	183	171
3/19/2009	4:00 PM	839	454	385	3/20/2009	4:00 PM	777	391	386	3/21/2009	4:00 PM	466	266	200	3/22/2009	4:00 PM	317	158	159
3/19/2009	5:00 PM	654	345	309	3/20/2009	5:00 PM	727	411	316	3/21/2009	5:00 PM	365	195	170	3/22/2009	5:00 PM	263	136	127
3/19/2009	6:00 PM	300	159	141	3/20/2009	6:00 PM	408	230	178	3/21/2009	6:00 PM	294	170	124	3/22/2009	6:00 PM	209	103	106
3/19/2009	7:00 PM	213	112	101	3/20/2009	7:00 PM	258	139	119	3/21/2009	7:00 PM	200	107	93	3/22/2009	7:00 PM	190	104	86
3/19/2009	8:00 PM	199	109	90	3/20/2009	8:00 PM	230	127	103	3/21/2009	8:00 PM	180	91	89	3/22/2009	8:00 PM	190	102	88
3/19/2009	9:00 PM	97	53	44	3/20/2009	9:00 PM	177	81	96	3/21/2009	9:00 PM	175	96	79	3/22/2009	9:00 PM	121	62	59
3/19/2009	10:00 PM	102	54	48	3/20/2009	10:00 PM	128	63	65	3/21/2009	10:00 PM	134	71	63	3/22/2009	10:00 PM	75	41	34
3/19/2009	11:00 PM	62	32	30	3/20/2009	11:00 PM	116	52	64	3/21/2009	11:00 PM	76	47	29	3/22/2009	11:00 PM	50	26	24
		8,918	**4,907**	**4,011**			9,670	**5,271**	**4,399**			5,802	**3,295**	**2,507**			4,280	**2,269**	**2,011**

B A Y M E T R I C S

HST PROJECT - FRESNO

Date	15-Nov-09 Sunday				16-Nov-09 Monday				17-Nov-09 Tuesday				18-Nov-09 Wednesday				19-Nov-09 Thursday				20-Nov-09 Friday				21-Nov-09 Saturday			
Location	25. On Inyo Street, between Broadway Street and Van Ness Avenue																											
Direction	EB		WB		EB		WB		EB		WB		EB		WB		EB		WB		EB		WB		EB		WB	
TIME	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN
1200	7	0	5	0	0	0	0	0	3	0	2	0	1	0	0	0	3	0	1	0	1	0	1	0	4	0	2	0
1215	5	0	5	0	1	0	0	0	3	0	2	0	7	0	6	0	6	0	3	0	1	0	1	0	4	0	3	0
1230	4	0	2	0	0	0	0	0	0	0	0	0	1	0	0	0	3	0	4	0	2	0	2	0	3	0	3	0
1245	1	17	0	12	0	1	0	0	4	10	4	8	8	17	8	14	3	15	2	10	7	11	5	9	4	15	4	12
100	3	13	2	9	2	3	1	1	5	12	3	9	6	22	4	18	5	17	4	13	1	11	1	9	2	13	1	11
115	3	11	2	6	0	2	0	1	4	13	1	8	2	17	0	12	2	13	3	13	2	12	2	10	0	9	0	8
130	5	12	1	5	4	6	2	3	3	16	2	10	3	19	1	13	2	12	2	11	0	10	0	8	0	6	0	5
145	2	13	2	7	1	7	0	3	4	16	2	8	3	14	3	8	0	9	0	9	2	5	2	5	3	5	0	1
200	3	13	1	6	3	8	0	2	0	11	0	5	3	11	0	4	0	4	0	5	2	6	1	5	1	4	0	0
215	2	12	1	5	0	8	0	2	1	8	1	5	3	12	1	5	3	5	1	3	0	4	0	3	2	6	2	2
230	0	7	0	4	0	4	0	0	1	6	1	4	1	10	0	4	0	3	0	1	0	4	0	3	1	7	1	3
245	0	5	0	2	0	3	0	0	1	3	0	2	0	7	0	1	0	3	0	1	0	2	0	1	1	5	1	4
300	2	4	1	2	0	0	0	0	1	4	0	2	0	4	0	1	0	3	0	1	0	0	0	0	1	5	1	5
315	1	3	0	1	0	0	0	0	1	4	1	2	1	2	0	0	1	1	1	1	1	1	1	1	0	3	0	3
330	0	3	0	1	0	0	0	0	0	3	0	1	0	1	0	0	1	2	0	1	0	1	0	1	2	4	0	2
345	0	3	0	1	1	1	0	0	0	2	0	1	1	2	0	0	0	2	0	1	0	1	0	1	0	3	0	1
400	1	2	0	0	0	1	0	0	1	2	0	1	0	2	0	0	0	2	0	1	0	1	0	1	0	2	0	0
415	0	1	0	0	1	2	0	0	0	1	0	0	1	2	0	0	0	1	0	0	0	0	0	0	1	3	0	0
430	3	4	1	1	0	2	0	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0
445	0	4	0	1	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0	0	2	2	1	1	2	3	0	0
500	0	3	0	1	1	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	1	1	4	0	0
515	0	3	0	1	1	2	0	0	3	3	1	1	0	0	0	0	2	2	0	0	3	5	1	2	1	4	1	1
530	0	0	0	0	5	7	1	1	8	11	3	4	5	5	2	2	10	12	2	2	5	10	0	2	0	4	0	1
545	0	0	0	0	4	11	2	3	6	17	4	8	8	13	4	6	8	20	3	5	6	14	3	4	3	5	0	1
600	0	0	0	0	14	24	3	6	13	30	3	11	12	25	2	8	10	30	3	8	11	25	4	8	3	7	0	1
615	0	0	0	0	10	33	4	10	7	34	3	13	6	31	1	9	7	35	3	11	4	26	1	8	4	10	1	1
630	1	1	0	0	3	31	0	9	2	28	1	11	3	29	0	7	7	32	3	12	3	24	1	9	4	14	1	2
645	0	1	0	0	7	34	3	10	8	30	3	10	6	27	3	6	11	35	4	13	7	25	3	9	4	15	2	4
700	7	8	1	1	15	35	3	10	24	41	9	16	28	43	9	13	19	44	7	17	21	35	10	15	4	16	0	4
715	1	9	0	1	20	45	12	18	14	48	3	16	13	50	5	17	26	63	10	24	16	47	8	22	1	13	0	3
730	2	10	1	2	31	73	11	29	33	79	11	26	22	69	8	25	29	85	9	30	28	72	12	33	2	11	1	3
745	2	12	0	2	47	113	18	44	44	115	20	43	43	106	22	44	48	122	25	51	44	109	22	52	5	12	2	3
800	4	9	3	4	68	166	23	64	66	157	28	62	59	137	16	51	66	169	20	64	61	149	26	68	11	19	4	7
815	4	12	2	6	51	197	34	86	56	199	38	97	57	181	26	72	62	205	35	89	51	184	29	89	12	30	7	14
830	2	12	1	6	57	223	38	113	67	233	46	132	33	192	17	81	41	217	23	103	51	207	23	100	7	35	4	17
845	7	17	0	6	41	217	22	117	50	239	29	141	38	187	11	70	34	203	18	96	37	200	21	99	7	37	0	15
900	8	21	3	6	28	177	12	106	36	209	17	130	29	157	16	70	37	174	19	95	33	172	18	91	9	35	4	15
915	9	26	2	6	29	155	19	91	27	180	20	112	29	129	16	60	38	150	21	81	25	146	15	77	11	34	4	12
930	11	35	6	11	43	141	23	76	26	139	13	79	20	116	8	51	30	139	14	72	41	136	20	74	10	37	3	11
945	13	41	5	16	31	131	18	72	30	119	14	64	39	117	18	58	37	142	18	72	27	126	15	68	16	46	7	18
1000	13	46	6	19	38	141	21	81	38	121	15	62	31	119	14	56	28	133	17	70	36	129	13	63	27	64	11	25
1015	17	54	8	25	38	150	18	80	46	140	18	60	50	140	18	58	34	129	18	67	34	138	14	62	28	81	15	36
1030	15	58	10	29	30	137	17	74	39	153	22	69	49	169	21	71	31	130	17	70	38	135	17	59	23	94	10	43
1045	26	71	13	37	36	142	15	71	31	154	16	71	49	179	25	78	42	135	23	75	37	145	20	64	33	111	13	49
1100	18	76	10	41	45	149	21	71	45	161	25	81	40	188	20	84	41	148	20	78	43	152	21	72	32	116	20	58
1115	19	78	7	40	46	157	22	75	41	156	23	86	34	172	17	83	37	151	20	80	45	163	25	83	23	111	12	55
1130	37	100	21	51	54	181	35	93	57	174	32	96	34	157	16	78	42	162	22	85	48	173	29	95	35	123	17	62
1145	36	110	20	58	67	212	28	106	41	184	17	97	42	150	21	74	48	168	27	89	55	191	26	101	52	142	24	73
1200	29	121	14	62	52	219	24	109	38	177	22	94	46	156	23	77	52	179	29	98	56	204	22	102	30	140	19	72
1215	23	125	9	64	71	244	38	125	61	197	21	92	49	171	30	90	52	194	31	109	66	225	39	116	37	154	22	82
1230	17	105	7	50	48	238	29	119	52	192	25	85	43	180	22	96	42	194	24	111	58	235	34	121	23	142	15	80
1245	30	99	19	49	55	226	25	116	62	213	32	100	48	186	26	101	60	206	33	117	55	235	29	124	33	123	18	74
1300	22	92	12	47	54	228	22	114	42	217	20	98	35	175	15	93	56	210	29	117	51	230	26	128	39	132	17	72
1315	23	92	9	47	58	215	33	109	55	211	23	100	57	183	29	92	60	218	26	112	61	225	38	127	41	136	19	69
1330	32	107	14	54	69	236	41	121	29	188	33	108	56	196	19	89	73	249	39	127	55	222	31	124	44	157	22	76
1345	42	119	22	57	62	243	33	129	0	126	28	104	52	200	30	93	49	238	18	112	60	227	29	124	28	152	13	71
1400	28	125	16	61	68	257	33	140	0	84	25	109	39	204	17	95	35	217	23	106	57	233	25	123	35	148	12	66
1415	33	135	14	66	55	254	25	132	64	93	31	117	45	192	28	94	45	202	27	107	58	230	28	113	33	140	16	63
1430	31	134	15	67	45	230	24	115	50	114	23	107	46	182	20	95	43	172	21	89	39	214	21	103	36	132	20	61
1445	32	124	13	58	39	207	20	102	54	168	29	108	38	168	18	83	45	168	17	88	55	209	33	107	46	150	33	81
1500	34	130	19	61	39	178	21	90	38	206	26	109	50	179	26	92	30	163	20	85	40	192	19	101	40	155	14	83
1515	34	131	20	67	43	166	27	92	38	180	21	99	36	170	17	81	48	166	24	82	50	184	29	102	32	154	15	82
1530	34	134	17	69	50	171	22	90	41	171	18	94	41	165	25	86	46	169	28	89	56	201	29	110	35	153	17	79
1545	28	130	12	68	79	211	55	125	66	183	36	101	45	172	28	96	34	158	17	89	64	210	36	113	43	150	22	68
1600	25	121	12	61	44	216	24	128	60	205	28	103	53	175	29	99	64	192	35	104	63	233	26	120	35	145	16	70
1615	21	108	9	50	55	228	36	137	38	205	25	107	59	198	41	123	59	203	33	113	47	230	25	116	26	139	12	67
1630	18	92	13	46	52	230	31	146	61	225	36	125	54	211	31	129	55	212	28	113	59	233	35	122	28	132	14	64
1645	19	83	7	41	44	195	24	115	58	217	27	116	60	226	37	138	65	243	35	131	46	215	29	115	35	124	15	57
1700	19	77	10	39	57	208	31	122	36	193	19	107	41	214	17	126	41	220	28	124	41	193	22	111	24	113	7	48
1715	12	68	3	33	67	220	42	128	73	228	51	133	65	220	43	128	67	228	45	136	61	207	34	120	30	117	10	46
1730	23	73	13	33	49	217	30	127	45	212	21	118	50	216	27	124	48	221	25	133	35	183	25	110	13	102	5	37
1745	24	78	11	37	43	216	24	127	37	191	17	108	42	198	22	109	41	197	27	125	30	167	19	100	27	94	13	35
1800	11	70	7	34	18	177	11	107	32	187	22	111	23	180	9	101	15	171	7	104	22	148	12	90	18	88	10	38
1815	4	62	4	35	17	127	9	74	20	134	8	68	14	129	9	67	22	126	12	71	21	108	12	68	12	70	7	35
1830	5	44	1	23	10	88	6	50	13	102	7	54	15	94	6	46	9	87	6	52	12	85	9	52	18	75	8	38
1845	5	25	2	14	8	53	4	30	8	73	6	43	7	59	5	29	11	57	6	31	8	63	4	37	10	58	4	29
1900	6	20	3	10	1	36	1	20	9	50	6	27	4	40	2	22	13	55	5	29	8	49	4	29	7	47	3	22
1915	9	25	3	9	7	26	3	14	7	37	5	24	10	36	5	18	5	38	2	19	4	32	2	19	7	42	4	19
1930	9	29	6	14	6	22	3	11	4	28	1	18	3	24	3	15	5	34	3	16	8	28	5	15	6	30	3	14
1945	6	30	1	13	10	24	5	12	10	30	6	18	6	23	4	14	7	30	2	12	9	29	6	17	20	40	7	17
2000	5	29	4	14	4	27	1	12	3	24	1	13	6	25	1	13	1	18	1	8	10	31	4	17	0	33	0	14
2015	3	23	2	13	5	25	2	11	4	21	1	9	4	19	1	9	5	18	2	8	7	34	1	16	5	31	3	13
2030	2	16	2	9	0	19	0	8	3	20	2	10	7	23	4	10	6	19	3	8	3	29	2	13	4	29	4	14
2045	6	16	6	14	5	14	2	5	7	17	3	7	6	23	2	8	7	19	1	7	6	26	2	9	6	15	2	9
2100	4	15	2	12	2	12	1	5	3	17	2	8	8	25	7	14	1	19	1	7	7	23	6	11	11	26	7	16
2115	7	19	4	14	5	12	5	8	1	14	0	7	3	24	0	13	7	21	1	6	8	24	2	12	4	25	2	15
2130	1	18	1	13	5	17	0	8	6	17	4	9	10	27	5	14	7	22	4	7	5	26	0	10	3	24	1	12
2145	3	15	1	8	5	17	3	9	2	12	1	7	5	26	1	13	6	21	2	8	4	24	0	8	2	20	0	10
2200	5	16	4	10	2	17	1	9	7	16	4	9	3	21	0	6	3	23	2	9	3	20	3	5	3	12	2	5
2215	3	12	0	6	3	15	2	6	7	22	6	15	7	25	4	10	2	18	0	8	7	19	5	8	10	18	4	7
2230	2	13	1	6	4	14	1	7	7	23	4	15	0	15	0	5	4	15	2	6	6	20	4	12	4	19	2	8
2245	3	13	2	7	5	14	3	7	7	28	4	18	2	12	1	5	4	13	2	6	4	20	1	13	9	26	5	13
2300	5	13	4	7	1	13	0	6	0	21	0	14	1	10	1	6	8	18	6	10	1	18	0	10	5	28	3	14
2315	1	11	0	7	3	13	1	5	4	18	2	10	2	5	1	3	5	21	1	11	8	19	5	10	5	23	5	15
2330	0	9	0	6	2	11	2	6	4	15	3	9	3	8	3	6	4	21	3	12	2	15	1	7	4	23	1	14
2345	4	10	3	7	2	8	1	4	0	8	0	5	2	8	1	6	2	19	2	12	5	16	1	7	4	18	3	12
TOTAL	1,036	N/A	515	N/A	2,301	N/A	1,207	N/A	2,156	N/A	1,188	N/A	2,121	N/A	1,054	N/A	2,223	N/A	1,160	N/A	2,272	N/A	1,188	N/A	1,369	N/A	657	N/A
AM	41		16		223		117		239		141		192		81		217		103		207		100		46		18	
NOON	135		67		257		140		217		117		204		101		249		127		235		128		157		82	
PM	134		69		230		146		228		133		226		138		243		136		233		122		155		83	
EVEN	29		14		27		12		28		18		27		14		23		12		34		17		33		16	

Telephone: (510) 232-1271 *Fax: (510) 232-1272*

B A Y M E T R I C S

HST PROJECT - FRESNO

Date	15-Nov-09 Sunday				16-Nov-09 Monday				17-Nov-09 Tuesday				18-Nov-09 Wednesday				19-Nov-09 Thursday				20-Nov-09 Friday				21-Nov-09 Saturday			
Location	32. On Ventura Avenue, between M Street and Van Ness Avenue																											
Direction	EB		WB		EB		WB		EB		WB		EB		WB		EB		WB		EB		WB		EB		WB	
TIME	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN
1200	15	0	24	0	6	0	9	0	7	0	8	0	9	0	9	0	9	0	10	0	12	0	5	0	21	0	9	0
1215	27	0	18	0	15	0	8	0	9	0	8	0	8	0	9	0	15	0	6	0	6	0	6	0	11	0	16	0
1230	18	0	15	0	1	0	4	0	14	0	5	0	11	0	8	0	23	0	6	0	19	0	5	0	24	0	12	0
1245	19	79	7	64	1	23	6	27	22	52	2	23	34	62	4	30	23	70	9	31	34	71	6	22	25	81	11	48
100	14	78	5	45	6	23	7	25	11	56	0	15	9	62	1	22	13	74	9	30	10	69	6	23	9	69	6	45
115	20	71	12	39	1	9	2	19	9	56	7	14	5	59	8	21	10	69	8	32	9	72	10	27	12	70	11	40
130	15	68	9	33	6	14	5	20	3	45	4	13	6	54	5	18	8	54	0	26	10	63	2	24	14	60	11	39
145	38	87	9	35	8	21	2	16	4	27	4	15	6	26	2	16	9	40	5	22	7	36	4	22	8	43	8	36
200	23	96	7	37	1	16	5	14	0	16	0	15	2	19	5	20	2	29	2	15	4	30	5	21	8	42	8	38
215	11	87	12	37	7	22	2	14	1	8	2	10	0	14	1	13	4	23	2	9	3	24	1	12	14	44	5	32
230	6	78	22	50	0	16	2	11	5	10	1	7	6	14	1	9	2	17	4	13	3	17	6	16	6	36	1	22
245	3	43	8	49	6	14	2	11	3	9	1	4	3	11	3	10	4	12	3	11	2	12	2	14	4	32	8	22
300	5	25	10	52	2	15	1	7	2	11	0	4	2	11	1	6	0	10	0	9	3	11	6	15	5	29	6	20
315	2	16	9	49	3	11	1	6	1	11	0	2	2	13	1	6	2	8	1	8	3	11	1	15	1	16	4	19
330	2	12	6	33	3	14	1	5	2	8	1	2	5	12	1	6	0	6	2	6	2	10	0	9	5	15	0	18
345	4	13	3	28	5	13	2	5	8	13	1	2	5	14	0	3	3	5	1	4	5	13	2	9	2	13	0	10
400	3	11	3	21	5	16	3	7	6	17	6	8	1	13	3	5	3	8	5	9	3	13	4	7	0	8	2	6
415	2	11	1	13	3	16	5	11	4	20	2	10	4	15	2	6	4	10	0	8	3	13	2	8	2	9	4	6
430	1	10	0	7	3	16	5	15	3	21	2	11	3	13	0	5	4	14	5	11	3	14	3	11	3	7	2	8
445	3	9	2	6	1	12	9	22	4	17	6	16	3	11	12	17	3	14	8	18	3	12	9	18	3	8	2	10
500	4	10	1	4	10	17	9	28	6	17	10	20	2	12	18	32	7	18	9	22	5	14	11	25	3	11	8	16
515	6	14	3	6	7	21	16	39	2	15	15	33	15	23	18	48	5	19	11	33	10	21	12	35	5	14	5	17
530	3	16	7	13	13	31	35	69	10	22	29	60	8	28	27	75	14	29	27	55	5	23	32	64	8	19	13	28
545	7	20	5	16	10	40	32	92	12	30	32	86	13	38	24	87	15	41	30	77	13	33	25	80	2	18	18	44
600	2	18	14	29	18	48	45	128	29	53	36	112	21	57	43	112	21	55	44	112	17	45	24	93	9	24	29	65
615	12	24	2	28	15	56	23	135	17	68	23	120	19	61	24	118	17	67	27	128	15	50	34	115	11	30	8	68
630	20	41	6	27	14	57	24	124	28	86	27	118	20	73	27	118	18	71	29	130	18	63	23	106	9	31	14	69
645	15	49	5	27	38	85	54	146	54	128	46	132	46	106	56	150	43	99	46	146	45	95	43	124	16	45	12	63
700	21	68	11	24	49	116	62	163	59	158	83	179	54	139	52	159	65	143	72	174	55	133	57	157	24	60	24	58
715	18	74	11	33	48	149	58	198	61	202	67	223	56	176	76	211	60	186	59	206	49	167	54	177	24	73	22	72
730	23	77	14	41	88	223	86	260	96	270	85	281	75	231	94	278	103	271	98	275	85	234	84	238	30	94	21	79
745	22	84	15	51	100	285	114	320	121	337	127	362	120	305	126	348	106	334	118	347	121	310	118	313	40	118	26	93
800	20	83	21	61	127	363	102	360	122	400	126	405	148	399	114	410	132	401	130	405	130	385	94	350	62	156	38	107
815	32	97	15	65	92	407	94	396	119	458	113	451	96	439	100	434	92	433	124	470	88	424	102	398	71	203	44	129
830	29	103	35	86	82	401	82	392	87	449	99	465	88	452	100	440	93	423	89	461	84	423	98	412	68	241	41	149
845	43	124	40	111	74	375	94	372	89	417	83	421	96	428	93	407	93	410	111	454	95	397	93	387	59	260	41	164
900	51	155	42	132	94	342	80	350	77	372	103	398	86	366	88	381	98	376	100	424	99	366	81	374	79	277	59	185
915	71	194	36	153	96	346	100	356	93	346	92	377	74	344	84	365	81	365	74	374	76	354	90	362	57	263	56	197
930	61	226	47	165	96	360	79	353	91	350	69	347	72	328	90	355	87	359	74	359	118	388	83	347	67	262	62	218
945	83	266	58	183	98	384	83	342	93	354	82	346	108	340	92	354	75	341	69	317	126	419	104	358	80	283	67	244
1000	82	297	66	207	103	393	105	367	97	374	104	347	110	364	104	370	98	341	95	312	120	440	116	393	91	295	84	269
1015	92	318	47	218	97	394	92	359	97	378	72	327	104	394	117	403	95	355	92	330	115	479	106	409	78	316	48	261
1030	81	338	73	244	100	398	80	360	95	382	91	349	103	425	109	422	87	355	87	343	120	481	96	422	76	325	66	265
1045	84	339	64	250	87	387	89	366	85	374	87	354	112	429	90	420	93	373	107	381	103	458	109	427	73	318	78	276
1100	115	372	67	251	106	390	108	369	95	372	107	357	89	408	102	418	124	399	99	385	108	446	107	418	92	319	88	280
1115	72	352	69	273	132	425	101	378	101	376	114	399	87	391	95	396	117	421	97	390	128	459	105	417	97	338	63	295
1130	92	363	69	269	101	426	99	397	112	393	107	415	99	387	74	361	121	455	115	418	154	493	93	414	85	347	87	316
1145	81	360	84	289	109	448	131	439	121	429	108	436	126	401	150	421	123	485	86	397	105	495	132	437	73	347	97	335
1200	93	338	68	290	123	465	115	446	123	457	90	419	142	454	114	433	132	493	121	419	119	506	110	440	86	341	44	291
1215	84	350	79	300	143	476	132	477	110	466	99	404	117	484	138	476	105	481	126	448	145	523	124	459	95	339	99	327
1230	98	356	98	329	130	505	128	506	123	477	94	391	112	497	99	501	117	477	133	466	132	501	114	480	92	346	87	327
1245	89	364	61	306	127	523	117	492	128	484	124	407	111	482	108	459	111	465	121	501	126	522	118	466	94	367	78	308
1300	104	375	89	327	133	533	151	528	123	484	121	438	121	461	115	460	99	432	117	497	119	522	126	482	85	366	95	359
1315	94	385	91	339	139	529	141	537	106	480	121	460	124	468	130	452	91	418	114	485	144	521	127	485	82	353	84	344
1330	109	396	87	328	138	537	161	570	118	475	138	504	96	452	117	470	102	403	110	462	114	503	132	503	102	363	86	343
1345	111	418	86	353	133	543	156	609	122	469	121	501	115	456	114	476	122	414	114	455	111	488	126	511	110	379	93	358
1400	103	417	101	365	147	557	152	610	128	474	132	512	97	432	100	461	115	430	115	453	130	499	125	510	100	394	85	348
1415	90	413	119	393	118	536	138	607	108	476	104	495	102	410	102	433	112	451	99	438	108	463	111	494	103	415	103	367
1430	71	375	96	402	105	503	104	550	121	479	113	470	111	425	106	422	129	478	119	447	127	476	111	473	84	397	85	366
1445	95	359	115	431	125	495	128	522	112	469	138	487	113	423	106	414	128	484	128	461	127	492	125	472	95	382	101	374
1500	103	359	164	494	118	466	112	482	149	490	101	456	125	451	114	428	130	499	108	454	150	512	109	456	83	365	93	382
1515	76	345	115	490	121	469	134	478	110	492	98	450	100	449	133	459	114	501	127	482	153	557	123	468	84	346	95	374
1530	77	351	87	481	126	490	153	527	99	470	106	443	103	441	101	454	109	481	120	483	111	541	120	477	78	340	78	367
1545	82	338	89	455	164	529	185	584	143	501	129	434	128	456	133	481	134	487	129	484	137	551	144	496	83	328	89	355
1600	75	310	87	378	123	534	128	600	116	468	111	444	131	462	117	484	125	482	127	503	130	531	121	508	83	328	96	358
1615	92	326	73	336	143	556	144	610	111	469	131	477	116	478	141	492	141	509	129	505	126	504	136	521	92	336	80	343
1630	79	328	71	320	127	557	117	574	139	509	112	483	114	489	115	506	131	531	119	504	118	511	116	517	83	341	87	352
1645	77	323	82	313	165	558	180	569	139	505	168	522	156	517	167	540	146	543	189	564	140	514	176	549	70	328	94	357
1700	81	329	80	306	100	535	125	566	126	515	104	515	126	512	125	548	106	524	123	560	120	504	119	547	80	325	85	346
1715	69	306	69	302	140	532	138	560	153	557	157	541	146	542	175	582	156	539	135	566	156	534	151	562	78	311	68	334
1730	63	290	93	324	118	523	106	549	135	553	111	540	110	538	115	582	132	540	103	550	130	546	109	555	60	288	64	311
1745	83	296	69	311	97	455	78	447	102	516	109	481	102	484	95	510	106	500	89	450	103	509	93	472	70	288	82	299
1800	61	276	69	300	69	424	80	402	72	462	82	459	79	437	78	463	86	480	67	394	84	473	77	430	69	277	81	295
1815	66	273	67	298	71	355	57	321	73	382	63	365	78	369	75	363	68	392	70	329	85	402	79	358	69	268	60	287
1830	38	248	63	268	51	288	57	272	50	297	54	308	47	306	47	295	54	314	70	296	70	342	87	336	60	268	55	278
1845	42	207	57	256	42	233	64	258	53	248	55	254	59	263	56	256	49	257	58	265	81	320	63	306	54	252	76	272
1900	31	177	54	241	55	219	45	223	67	243	60	232	80	264	60	238	57	228	62	260	61	297	57	286	49	232	93	284
1915	37	148	45	219	28	176	37	203	60	230	55	224	52	238	52	215	44	204	44	234	54	266	54	261	40	203	63	287
1930	55	165	121	277	42	167	46	192	48	228	64	234	38	229	49	217	38	188	42	206	38	234	45	219	46	189	61	293
1945	33	156	73	293	38	163	59	187	50	225	46	225	44	214	60	221	42	181	55	203	36	189	62	218	42	177	77	294
2000	33	158	28	267	32	140	46	188	42	200	41	206	20	154	36	197	26	150	17	158	33	161	36	197	31	159	78	279
2015	29	150	49	271	28	140	29	180	40	180	21	172	33	135	35	180	28	134	40	154	43	150	32	175	30	149	53	269
2030	20	115	25	175	27	125	36	170	13	145	32	140	33	130	39	170	25	121	17	129	30	142	42	172	31	134	29	237
2045	29	111	30	132	33	120	24	135	32	127	24	118	35	121	38	148	24	103	34	108	29	135	38	148	29	121	30	190
2100	22	100	31	135	24	112	25	114	19	104	26	103	20	121	33	145	28	105	34	125	24	126	39	151	34	124	35	147
2115	24	95	36	122	18	102	27	112	22	86	33	115	28	116	32	142	22	99	24	109	28	111	33	152	38	132	46	140
2130	19	94	34	131	18	93	20	96	24	97	21	104	27	110	28	131	22	96	27	119	31	112	35	145	25	126	24	135
2145	20	85	38	139	20	80	27	99	14	79	23	103	23	98	22	115	18	90	23	108	28	111	28	135	32	129	31	136
2200	18	81	21	129	10	66	13	87	18	78	19	96	20	98	21	103	19	81	27	101	20	107	44	140	56	151	53	154
2215	18	75	10	103	21	69	18	78	57	113	45	108	49	119	61	132	26	85	20	97	27	106	60	167	62	175	67	175
2230	10	66	15	84	9	60	19	77	22	111	19	106	17	109	11	115	16	79	23	93	23	98	23	155	27	177	51	202
2245	16	62	9	55	18	58	14	64	17	114	15	98	17	103	15	108	12	73	15	85	25	95	21	148	24	169	34	205
2300	11	55	10	44	7	55	8	59	9	105	10	89	11	94	9	96	21	75	8	66	14	89	21	125	21	134	29	181
2315	11	48	11	45	14	48	10	51	15	63	14	58	14	59	10	45	22	71	15	61	33	95	16	81	23	95	17	131
2330	9	47	14	44	10	49	7	39	13	54	9	48	6	48	11	45	11	66	16	54	15	87	15	73	23	91	24	104
2345	7	38	13	48	15	46	5	30	8	45	6	39	8	39	7	37	11	65	11	50	15	77	5	57	21	88	33	103
TOTAL	4,230	N/A	4,201	N/A	5,890	N/A	6,154	N/A	5,969	N/A	5,866	N/A	5,827	N/A	6,028	N/A	5,886	N/A	5,939	N/A	6,354	N/A	6,189	N/A	4,574	N/A	4,596	N/A
AM	266		183		407		396		458		465		452		440		433		470		424		412		283		244	
NOON	418		431		557		610		484		512		497		501		493		501		523		511		415		374	
PM	359		494		558		610		557		541		542		582		543		566		557		562		365		382	
EVEN	158		271		140		188		200		206		154		197		150		158		161		197		177		279	

Telephone: (510) 232-1271 *Fax: (510) 232-1272*

APPENDIX C:
TECHNICAL CALCULATIONS – BASELINE CONDITIONS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	81	194	7	75	238	0	0	132	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.2	4.2	4.2	4.2			4.2	
Lane Util. Factor					0.95	1.00	1.00	1.00			1.00	
Frt					1.00	0.85	1.00	1.00			0.99	
Flt Protected					0.99	1.00	0.95	1.00			1.00	
Satd. Flow (prot)					3488	1583	1770	1863			1853	
Flt Permitted					0.99	1.00	0.66	1.00			1.00	
Satd. Flow (perm)					3488	1583	1222	1863			1853	
Peak-hour factor, PHF	0.92	0.92	0.92	0.81	0.81	0.81	0.93	0.93	0.93	0.86	0.86	0.86
Adj. Flow (vph)	0	0	0	100	240	9	81	256	0	0	153	6
RTOR Reduction (vph)	0	0	0	0	0	6	0	0	0	0	3	0
Lane Group Flow (vph)	0	0	0	0	340	3	81	256	0	0	156	0
Turn Type				Perm		Perm	Perm					
Protected Phases					4			6			2	
Permitted Phases				4		4	6					
Actuated Green, G (s)					22.0	22.0	28.0	28.0			28.0	
Effective Green, g (s)					22.0	22.0	28.0	28.0			28.0	
Actuated g/C Ratio					0.38	0.38	0.48	0.48			0.48	
Clearance Time (s)					4.2	4.2	4.2	4.2			4.2	
Lane Grp Cap (vph)					1314	596	586	893			888	
v/s Ratio Prot								c0.14			0.08	
v/s Ratio Perm					0.10	0.00	0.07					
v/c Ratio					0.26	0.01	0.14	0.29			0.18	
Uniform Delay, d1					12.6	11.4	8.5	9.2			8.6	
Progression Factor					1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2					0.5	0.0	0.5	0.8			0.4	
Delay (s)					13.0	11.4	9.0	10.0			9.1	
Level of Service					B	B	A	A			A	
Approach Delay (s)		0.0			13.0			9.7			9.1	
Approach LOS		A			B			A			A	

Intersection Summary			
HCM Average Control Delay	11.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	58.4	Sum of lost time (s)	8.4
Intersection Capacity Utilization	75.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	10	230	8	6	12	0	0	77	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.4		5.4	5.4			5.4	
Lane Util. Factor					0.95		1.00	1.00			1.00	
Frt					1.00		1.00	1.00			0.96	
Flt Protected					1.00		0.95	1.00			1.00	
Satd. Flow (prot)					3443		1805	1900			1777	
Flt Permitted					1.00		0.68	1.00			1.00	
Satd. Flow (perm)					3443		1286	1900			1777	
Peak-hour factor, PHF	0.85	0.85	0.85	1.00	1.00	1.00	0.64	0.64	0.64	0.85	0.85	0.85
Adj. Flow (vph)	0	0	0	10	230	8	9	19	0	0	91	34
RTOR Reduction (vph)	0	0	0	0	4	0	0	0	0	0	22	0
Lane Group Flow (vph)	0	0	0	0	244	0	9	19	0	0	103	0
Heavy Vehicles (%)	2%	2%	2%	0%	4%	13%	0%	0%	0%	0%	3%	3%
Turn Type				Perm			Perm					
Protected Phases					8			2			2	
Permitted Phases				8			2					
Actuated Green, G (s)					30.6		18.6	18.6			18.6	
Effective Green, g (s)					30.6		18.6	18.6			18.6	
Actuated g/C Ratio					0.51		0.31	0.31			0.31	
Clearance Time (s)					5.4		5.4	5.4			5.4	
Lane Grp Cap (vph)					1756		399	589			551	
v/s Ratio Prot								0.01			c0.06	
v/s Ratio Perm					0.07		0.01					
v/c Ratio					0.14		0.02	0.03			0.19	
Uniform Delay, d1					7.8		14.4	14.4			15.2	
Progression Factor					1.00		1.00	1.00			1.00	
Incremental Delay, d2					0.2		0.1	0.1			0.7	
Delay (s)					7.9		14.5	14.5			15.9	
Level of Service					A		B	B			B	
Approach Delay (s)		0.0			7.9			14.5			15.9	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM Average Control Delay	10.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.16		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.8
Intersection Capacity Utilization	60.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	115	236	3	5	37	0	0	112	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.2	4.2	4.2	4.2	4.2			4.2	
Lane Util. Factor				1.00	0.95	1.00	1.00	1.00			0.95	
Frt				1.00	1.00	0.85	1.00	1.00			0.96	
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (prot)				1770	3539	1583	1770	1863			3389	
Flt Permitted				0.95	1.00	1.00	0.64	1.00			1.00	
Satd. Flow (perm)				1770	3539	1583	1184	1863			3389	
Peak-hour factor, PHF	0.92	0.92	0.92	0.96	0.96	0.96	0.58	0.58	0.58	0.85	0.85	0.85
Adj. Flow (vph)	0	0	0	120	246	3	9	64	0	0	132	52
RTOR Reduction (vph)	0	0	0	0	0	1	0	0	0	0	35	0
Lane Group Flow (vph)	0	0	0	120	246	2	9	64	0	0	149	0
Turn Type				Perm		Perm	Perm					
Protected Phases					4			2			2	
Permitted Phases				4		4	2					
Actuated Green, G (s)				31.0	31.0	31.0	19.0	19.0			19.0	
Effective Green, g (s)				31.0	31.0	31.0	19.0	19.0			19.0	
Actuated g/C Ratio				0.53	0.53	0.53	0.33	0.33			0.33	
Clearance Time (s)				4.2	4.2	4.2	4.2	4.2			4.2	
Lane Grp Cap (vph)				940	1879	840	385	606			1103	
v/s Ratio Prot					c0.07			0.03			c0.04	
v/s Ratio Perm				0.07		0.00	0.01					
v/c Ratio				0.13	0.13	0.00	0.02	0.11			0.14	
Uniform Delay, d1				6.9	6.9	6.4	13.4	13.8			13.9	
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2				0.3	0.1	0.0	0.1	0.4			0.3	
Delay (s)				7.2	7.1	6.4	13.5	14.1			14.2	
Level of Service				A	A	A	B	B			B	
Approach Delay (s)		0.0			7.1			14.0			14.2	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM Average Control Delay	10.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.13		
Actuated Cycle Length (s)	58.4	Sum of lost time (s)	8.4
Intersection Capacity Utilization	60.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	52	493	51	0	0	0	0	13	8	108	97	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2	4.2					4.2	4.2	4.6	4.6	
Lane Util. Factor	1.00	0.95	1.00					1.00	1.00	0.95	0.95	
Frt	1.00	1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00					1.00	1.00	0.95	0.99	
Satd. Flow (prot)	1770	3539	1583					1863	1583	1681	1760	
Flt Permitted	0.95	1.00	1.00					1.00	1.00	0.75	0.97	
Satd. Flow (perm)	1770	3539	1583					1863	1583	1321	1724	
Peak-hour factor, PHF	0.96	0.96	0.96	0.92	0.92	0.92	0.75	0.75	0.75	0.80	0.80	0.80
Adj. Flow (vph)	54	514	53	0	0	0	0	17	11	135	121	0
RTOR Reduction (vph)	0	0	36	0	0	0	0	0	9	0	0	0
Lane Group Flow (vph)	54	514	17	0	0	0	0	17	2	121	135	0
Turn Type	Perm		Perm						Perm	Perm		
Protected Phases		8						1			2	
Permitted Phases	8		8						1	2		
Actuated Green, G (s)	19.0	19.0	19.0					13.0	13.0	13.0	13.0	
Effective Green, g (s)	19.0	19.0	19.0					13.0	13.0	13.0	13.0	
Actuated g/C Ratio	0.33	0.33	0.33					0.22	0.22	0.22	0.22	
Clearance Time (s)	4.2	4.2	4.2					4.2	4.2	4.6	4.6	
Lane Grp Cap (vph)	580	1159	519					418	355	296	386	
v/s Ratio Prot		c0.15						c0.01				
v/s Ratio Perm	0.03		0.01						0.00	c0.09	0.08	
v/c Ratio	0.09	0.44	0.03					0.04	0.01	0.41	0.35	
Uniform Delay, d1	13.5	15.3	13.3					17.6	17.5	19.2	18.9	
Progression Factor	1.00	1.00	1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	1.2	0.1					0.2	0.0	4.1	2.5	
Delay (s)	13.8	16.6	13.4					17.8	17.5	23.4	21.4	
Level of Service	B	B	B					B	B	C	C	
Approach Delay (s)		16.1			0.0			17.7			22.3	
Approach LOS		B			A			B			C	

Intersection Summary			
HCM Average Control Delay	17.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	58.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	60.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	16	529	0	0	64	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2			4.0	
Lane Util. Factor		0.95			0.97	
Frt		1.00			1.00	
Flt Protected		1.00			0.95	
Satd. Flow (prot)		3503			3335	
Flt Permitted		1.00			0.95	
Satd. Flow (perm)		3503			3335	
Peak-hour factor, PHF	0.77	0.77	0.25	0.25	1.00	1.00
Adj. Flow (vph)	21	687	0	0	64	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	708	0	0	64	0
Heavy Vehicles (%)	0%	3%	0%	0%	5%	0%
Turn Type	Perm					
Protected Phases		8				
Permitted Phases	8				2	
Actuated Green, G (s)		30.0			26.0	
Effective Green, g (s)		30.0			26.0	
Actuated g/C Ratio		0.47			0.40	
Clearance Time (s)		4.2			4.0	
Vehicle Extension (s)		3.0			3.0	
Lane Grp Cap (vph)		1637			1351	
v/s Ratio Prot						
v/s Ratio Perm		0.20			c0.02	
v/c Ratio		0.43			0.05	
Uniform Delay, d1		11.4			11.6	
Progression Factor		1.00			1.00	
Incremental Delay, d2		0.2			0.0	
Delay (s)		11.6			11.6	
Level of Service		B			B	
Approach Delay (s)		11.6	0.0		11.6	
Approach LOS		B	A		B	

Intersection Summary			
HCM Average Control Delay	11.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.25		
Actuated Cycle Length (s)	64.2	Sum of lost time (s)	8.2
Intersection Capacity Utilization	78.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	42	426	100	0	0	0	0	273	44	18	195	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2						4.2		4.2	4.2	
Lane Util. Factor		0.95						1.00		1.00	1.00	
Frt		0.97						0.98		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		3433						1828		1770	1863	
Flt Permitted		1.00						1.00		0.49	1.00	
Satd. Flow (perm)		3433						1828		911	1863	
Peak-hour factor, PHF	0.85	0.85	0.85	0.92	0.92	0.92	0.91	0.91	0.91	0.87	0.87	0.87
Adj. Flow (vph)	49	501	118	0	0	0	0	300	48	21	224	0
RTOR Reduction (vph)	0	23	0	0	0	0	0	8	0	0	0	0
Lane Group Flow (vph)	0	645	0	0	0	0	0	340	0	21	224	0
Turn Type	Perm									Perm		
Protected Phases		8						6			2	
Permitted Phases	8									2		
Actuated Green, G (s)		22.0						27.0		27.0	27.0	
Effective Green, g (s)		22.0						27.0		27.0	27.0	
Actuated g/C Ratio		0.38						0.47		0.47	0.47	
Clearance Time (s)		4.2						4.2		4.2	4.2	
Vehicle Extension (s)		3.0						3.0		3.0	3.0	
Lane Grp Cap (vph)		1316						860		429	876	
v/s Ratio Prot								c0.19			0.12	
v/s Ratio Perm		0.19								0.02		
v/c Ratio		0.49						0.40		0.05	0.26	
Uniform Delay, d1		13.4						9.9		8.2	9.2	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		0.3						0.3		0.0	0.2	
Delay (s)		13.7						10.2		8.3	9.3	
Level of Service		B						B		A	A	
Approach Delay (s)		13.7			0.0			10.2			9.2	
Approach LOS		B			A			B			A	

Intersection Summary			
HCM Average Control Delay	11.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	57.4	Sum of lost time (s)	8.4
Intersection Capacity Utilization	75.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	122	406	92	63	205	58	99	254	183	69	152	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.2		4.1	4.2		4.1	4.2		4.1	4.2	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	
Frt	1.00	0.97		1.00	0.97		1.00	0.94		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3441		1770	3449		1770	3317		1770	1786	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3441		1770	3449		1770	3317		1770	1786	
Peak-hour factor, PHF	0.96	0.96	0.96	0.80	0.80	0.80	0.85	0.85	0.85	0.84	0.84	0.84
Adj. Flow (vph)	127	423	96	79	256	72	116	299	215	82	181	68
RTOR Reduction (vph)	0	18	0	0	24	0	0	92	0	0	10	0
Lane Group Flow (vph)	127	501	0	79	304	0	116	422	0	82	239	0
Heavy Vehicles (%)	2%	2%	2%	2%	1%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	13.3	29.2		9.1	25.0		12.6	47.9		9.2	44.5	
Effective Green, g (s)	13.3	29.2		9.1	25.0		12.6	47.9		9.2	44.5	
Actuated g/C Ratio	0.12	0.26		0.08	0.22		0.11	0.43		0.08	0.40	
Clearance Time (s)	4.1	4.2		4.1	4.2		4.1	4.2		4.1	4.2	
Vehicle Extension (s)	3.0	5.0		3.0	5.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	210	897		144	770		199	1419		145	710	
v/s Ratio Prot	c0.07	c0.15		0.04	0.09		c0.07	c0.13		0.05	c0.13	
v/s Ratio Perm												
v/c Ratio	0.60	0.56		0.55	0.39		0.58	0.30		0.57	0.34	
Uniform Delay, d1	46.9	35.8		49.5	37.1		47.2	21.0		49.5	23.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.9	1.3		4.2	0.7		4.3	0.5		5.0	1.3	
Delay (s)	51.7	37.1		53.7	37.8		51.5	21.6		54.5	24.8	
Level of Service	D	D		D	D		D	C		D	C	
Approach Delay (s)		40.0			40.8			27.1			32.1	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM Average Control Delay	34.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	16.6
Intersection Capacity Utilization	50.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	31	98	12	39	110	75	15	134	24	200	194	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2		4.2	4.2		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.94		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3480		1770	3324		1770	1820		1770	1863	1583
Flt Permitted	0.61	1.00		0.67	1.00		0.57	1.00		0.64	1.00	1.00
Satd. Flow (perm)	1144	3480		1241	3324		1053	1820		1197	1863	1583
Peak-hour factor, PHF	0.82	0.82	0.82	0.84	0.84	0.84	0.87	0.87	0.87	0.74	0.74	0.74
Adj. Flow (vph)	38	120	15	46	131	89	17	154	28	270	262	23
RTOR Reduction (vph)	0	8	0	0	50	0	0	11	0	0	0	14
Lane Group Flow (vph)	38	127	0	46	170	0	17	171	0	270	262	9
Turn Type	Perm			Perm			Perm			Perm		Perm
Protected Phases		8			4			6			2	
Permitted Phases	8			4			6			2		2
Actuated Green, G (s)	25.0	25.0		25.0	25.0		23.0	23.0		23.0	23.0	23.0
Effective Green, g (s)	25.0	25.0		25.0	25.0		23.0	23.0		23.0	23.0	23.0
Actuated g/C Ratio	0.44	0.44		0.44	0.44		0.41	0.41		0.41	0.41	0.41
Clearance Time (s)	4.2	4.2		4.2	4.2		4.5	4.5		4.5	4.5	4.5
Lane Grp Cap (vph)	504	1534		547	1466		427	738		486	756	642
v/s Ratio Prot		0.04			c0.05			0.09			0.14	
v/s Ratio Perm	0.03			0.04			0.02			c0.23		0.01
v/c Ratio	0.08	0.08		0.08	0.12		0.04	0.23		0.56	0.35	0.01
Uniform Delay, d1	9.2	9.2		9.2	9.3		10.2	11.1		12.9	11.7	10.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.3	0.1		0.3	0.2		0.2	0.7		4.5	1.3	0.0
Delay (s)	9.5	9.3		9.5	9.5		10.4	11.8		17.5	12.9	10.1
Level of Service	A	A		A	A		B	B		B	B	B
Approach Delay (s)		9.3			9.5			11.7			15.0	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM Average Control Delay	12.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	56.7	Sum of lost time (s)	8.7
Intersection Capacity Utilization	75.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	71	215	21	37	164	156	49	377	54	85	108	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.2		4.0	4.2		4.0	4.2		4.0	4.2	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	
Frt	1.00	0.99		1.00	0.93		1.00	0.98		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3493		1770	3297		1770	3472		1770	1772	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3493		1770	3297		1770	3472		1770	1772	
Peak-hour factor, PHF	0.74	0.74	0.74	0.74	0.74	0.74	0.89	0.89	0.89	0.96	0.96	0.96
Adj. Flow (vph)	96	291	28	50	222	211	55	424	61	89	112	54
RTOR Reduction (vph)	0	6	0	0	145	0	0	11	0	0	16	0
Lane Group Flow (vph)	96	313	0	50	288	0	55	474	0	89	150	0
Heavy Vehicles (%)	2%	2%	2%	2%	1%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	7.0	26.4		4.3	23.7		4.4	21.5		6.8	23.9	
Effective Green, g (s)	7.0	26.4		4.3	23.7		4.4	21.5		6.8	23.9	
Actuated g/C Ratio	0.09	0.35		0.06	0.31		0.06	0.29		0.09	0.32	
Clearance Time (s)	4.0	4.2		4.0	4.2		4.0	4.2		4.0	4.2	
Vehicle Extension (s)	2.0	5.0		2.0	5.0		2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	164	1223		101	1036		103	990		160	562	
v/s Ratio Prot	c0.05	c0.09		0.03	0.09		0.03	c0.14		c0.05	0.08	
v/s Ratio Perm												
v/c Ratio	0.59	0.26		0.50	0.28		0.53	0.48		0.56	0.27	
Uniform Delay, d1	32.8	17.5		34.5	19.4		34.5	22.3		32.9	19.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.4	0.2		1.4	0.3		2.6	0.8		2.4	0.5	
Delay (s)	36.2	17.7		35.9	19.7		37.2	23.1		35.2	19.7	
Level of Service	D	B		D	B		D	C		D	B	
Approach Delay (s)		22.0			21.4			24.5			25.1	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	23.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	75.4	Sum of lost time (s)	16.4
Intersection Capacity Utilization	44.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	5	0	146	0	174	14	84	102	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.2		4.2	4.2	4.0	4.2	
Lane Util. Factor					1.00	1.00		1.00	1.00	1.00	1.00	
Frt					1.00	0.85		1.00	0.85	1.00	1.00	
Flt Protected					0.95	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)					1770	1583		1863	1583	1770	1863	
Flt Permitted					0.95	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)					1770	1583		1863	1583	1770	1863	
Peak-hour factor, PHF	0.85	0.85	0.85	0.59	0.85	0.59	0.85	0.80	0.80	0.80	0.80	0.85
Adj. Flow (vph)	0	0	0	8	0	247	0	218	18	105	128	0
RTOR Reduction (vph)	0	0	0	0	0	177	0	0	12	0	0	0
Lane Group Flow (vph)	0	0	0	0	8	70	0	218	6	105	128	0
Turn Type				Prot		custom	Perm		Perm	Prot		
Protected Phases				4	8			6		5	2	
Permitted Phases						4	6		6			
Actuated Green, G (s)					13.4	13.2		16.3	16.3	4.9	25.2	
Effective Green, g (s)					13.4	13.2		16.3	16.3	4.9	25.2	
Actuated g/C Ratio					0.29	0.28		0.35	0.35	0.10	0.54	
Clearance Time (s)					4.0	4.2		4.2	4.2	4.0	4.2	
Vehicle Extension (s)					3.0	2.0		4.8	4.8	3.0	4.8	
Lane Grp Cap (vph)					507	446		649	551	185	1003	
v/s Ratio Prot					0.00			c0.12		c0.06	0.07	
v/s Ratio Perm					0.00	c0.04			0.00			
v/c Ratio					0.02	0.16		0.34	0.01	0.57	0.13	
Uniform Delay, d1					12.0	12.6		11.3	10.0	19.9	5.4	
Progression Factor					1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2					0.0	0.1		0.6	0.0	4.0	0.1	
Delay (s)					12.0	12.7		11.9	10.0	23.9	5.5	
Level of Service					B	B		B	A	C	A	
Approach Delay (s)		0.0			12.7			11.7			13.8	
Approach LOS		A			B			B			B	

Intersection Summary			
HCM Average Control Delay	12.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	46.8	Sum of lost time (s)	12.4
Intersection Capacity Utilization	28.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	87	8	7	37	7	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.2	4.2
Lane Util. Factor	1.00		1.00	1.00	1.00	1.00
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	1829		1805	1900	1583	1615
Flt Permitted	1.00		0.66	1.00	0.95	1.00
Satd. Flow (perm)	1829		1262	1900	1583	1615
Peak-hour factor, PHF	0.65	0.65	1.00	1.00	1.00	1.00
Adj. Flow (vph)	134	12	7	37	7	13
RTOR Reduction (vph)	6	0	0	0	0	8
Lane Group Flow (vph)	141	0	7	37	7	5
Heavy Vehicles (%)	3%	0%	0%	0%	14%	0%
Turn Type			Perm			custom
Protected Phases	8			4		
Permitted Phases			4		6	6
Actuated Green, G (s)	30.0		30.0	30.0	21.8	21.8
Effective Green, g (s)	30.0		30.0	30.0	21.8	21.8
Actuated g/C Ratio	0.50		0.50	0.50	0.36	0.36
Clearance Time (s)	4.0		4.0	4.0	4.2	4.2
Lane Grp Cap (vph)	915		631	950	575	587
v/s Ratio Prot	c0.08			0.02		
v/s Ratio Perm			0.01		c0.00	0.00
v/c Ratio	0.15		0.01	0.04	0.01	0.01
Uniform Delay, d1	8.1		7.5	7.6	12.2	12.2
Progression Factor	1.00		1.58	1.58	1.00	1.00
Incremental Delay, d2	0.4		0.0	0.1	0.0	0.0
Delay (s)	8.5		11.9	12.2	12.3	12.2
Level of Service	A		B	B	B	B
Approach Delay (s)	8.5			12.1	12.2	
Approach LOS	A			B	B	

Intersection Summary			
HCM Average Control Delay	9.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.09		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.2
Intersection Capacity Utilization	47.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	21	53	5	6	28	16	31	455	54	5	102	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2		4.2	4.2		4.2	4.2		4.2	4.2	4.2
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.95		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1838		1770	1762		1770	1833		1770	1863	1583
Flt Permitted	0.72	1.00		0.70	1.00		0.67	1.00		0.29	1.00	1.00
Satd. Flow (perm)	1332	1838		1313	1762		1253	1833		537	1863	1583
Peak-hour factor, PHF	0.73	0.73	0.73	0.69	0.69	0.69	0.89	0.89	0.89	0.77	0.77	0.77
Adj. Flow (vph)	29	73	7	9	41	23	35	511	61	6	132	17
RTOR Reduction (vph)	0	4	0	0	14	0	0	7	0	0	0	9
Lane Group Flow (vph)	29	76	0	9	50	0	35	565	0	6	132	8
Turn Type	Perm			Perm			Perm			Perm		Perm
Protected Phases		8			4			6			2	
Permitted Phases	8			4			6			2		2
Actuated Green, G (s)	22.8	22.8		22.8	22.8		28.8	28.8		28.8	28.8	28.8
Effective Green, g (s)	22.8	22.8		22.8	22.8		28.8	28.8		28.8	28.8	28.8
Actuated g/C Ratio	0.38	0.38		0.38	0.38		0.48	0.48		0.48	0.48	0.48
Clearance Time (s)	4.2	4.2		4.2	4.2		4.2	4.2		4.2	4.2	4.2
Lane Grp Cap (vph)	506	698		499	670		601	880		258	894	760
v/s Ratio Prot		c0.04			0.03			c0.31			0.07	
v/s Ratio Perm	0.02			0.01			0.03			0.01		0.01
v/c Ratio	0.06	0.11		0.02	0.07		0.06	0.64		0.02	0.15	0.01
Uniform Delay, d1	11.8	12.0		11.6	11.9		8.3	11.7		8.2	8.7	8.2
Progression Factor	0.83	0.81		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.2	0.3		0.1	0.2		0.2	3.6		0.2	0.3	0.0
Delay (s)	10.0	10.1		11.7	12.1		8.5	15.3		8.4	9.1	8.2
Level of Service	A	B		B	B		A	B		A	A	A
Approach Delay (s)		10.0			12.0			14.9			9.0	
Approach LOS		B			B			B			A	

Intersection Summary			
HCM Average Control Delay	13.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.4
Intersection Capacity Utilization	72.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	71	563	10	3	381	104	17	9	2	30	16	29
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.83	0.83	0.83	0.92	0.92	0.92	0.78	0.78	0.78	0.89	0.89	0.89
Hourly flow rate (vph)	86	678	12	3	414	113	22	12	3	34	18	33
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					400							
pX, platoon unblocked	0.93						0.93	0.93		0.93	0.93	0.93
vC, conflicting volume	527			690			1111	1389	345	996	1339	264
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	351			690			976	1274	345	853	1220	68
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	92			100			86	92	100	84	88	96
cM capacity (veh/h)	1125			900			158	143	651	207	154	916

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	86	452	238	3	276	251	36	84
Volume Left	86	0	0	3	0	0	22	34
Volume Right	0	0	12	0	0	113	3	33
cSH	1125	1700	1700	900	1700	1700	161	267
Volume to Capacity	0.08	0.27	0.14	0.00	0.16	0.15	0.22	0.32
Queue Length 95th (ft)	6	0	0	0	0	0	20	33
Control Delay (s)	8.5	0.0	0.0	9.0	0.0	0.0	33.6	24.6
Lane LOS	A			A			D	C
Approach Delay (s)	0.9			0.1			33.6	24.6
Approach LOS							D	C

Intersection Summary			
Average Delay	2.8		
Intersection Capacity Utilization	33.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	7	449	107	14	417	13	60	38	5	17	17	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.2		4.0	4.2		5.6	5.6		5.6	5.6	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	0.95	
Frt	1.00	0.97		1.00	1.00		1.00	0.98		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3437		1770	3523		1770	1828		1770	3441	
Flt Permitted	0.95	1.00		0.95	1.00		0.74	1.00		0.72	1.00	
Satd. Flow (perm)	1770	3437		1770	3523		1376	1828		1341	3441	
Peak-hour factor, PHF	0.79	0.79	0.79	0.95	0.95	0.95	0.76	0.76	0.76	0.79	0.79	0.79
Adj. Flow (vph)	9	568	135	15	439	14	79	50	7	22	22	5
RTOR Reduction (vph)	0	23	0	0	2	0	0	5	0	0	4	0
Lane Group Flow (vph)	9	680	0	15	451	0	79	52	0	22	23	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	10.0	36.8		13.0	39.8		26.4	26.4		26.4	26.4	
Effective Green, g (s)	10.0	36.8		13.0	39.8		26.4	26.4		26.4	26.4	
Actuated g/C Ratio	0.11	0.41		0.14	0.44		0.29	0.29		0.29	0.29	
Clearance Time (s)	4.0	4.2		4.0	4.2		5.6	5.6		5.6	5.6	
Lane Grp Cap (vph)	197	1405		256	1558		404	536		393	1009	
v/s Ratio Prot	0.01	c0.20		c0.01	c0.13			0.03			0.01	
v/s Ratio Perm							c0.06			0.02		
v/c Ratio	0.05	0.48		0.06	0.29		0.20	0.10		0.06	0.02	
Uniform Delay, d1	35.7	19.6		33.2	16.1		23.8	23.1		22.8	22.6	
Progression Factor	1.00	1.00		0.81	1.02		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	1.2		0.4	0.5		1.1	0.4		0.3	0.0	
Delay (s)	36.2	20.8		27.4	16.9		24.9	23.5		23.1	22.7	
Level of Service	D	C		C	B		C	C		C	C	
Approach Delay (s)		21.0			17.2			24.3			22.9	
Approach LOS		C			B			C			C	

Intersection Summary			
HCM Average Control Delay	20.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	34.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	377	42	38	246	71	199	465	137	17	50	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.2		4.0	4.2		4.2	4.2	4.2	4.2	4.2	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	0.97		1.00	1.00	0.85	1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3486		1770	3420		1770	1863	1583	1770	1752	
Flt Permitted	0.95	1.00		0.95	1.00		0.69	1.00	1.00	0.18	1.00	
Satd. Flow (perm)	1770	3486		1770	3420		1283	1863	1583	332	1752	
Peak-hour factor, PHF	0.80	0.80	0.80	0.83	0.83	0.83	0.87	0.87	0.87	0.78	0.78	0.78
Adj. Flow (vph)	69	471	52	46	296	86	229	534	157	22	64	42
RTOR Reduction (vph)	0	8	0	0	27	0	0	0	39	0	27	0
Lane Group Flow (vph)	69	515	0	46	355	0	229	534	118	22	79	0
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	8.7	40.3		4.8	36.4		32.5	32.5	32.5	32.5	32.5	
Effective Green, g (s)	8.7	40.3		4.8	36.4		32.5	32.5	32.5	32.5	32.5	
Actuated g/C Ratio	0.10	0.45		0.05	0.40		0.36	0.36	0.36	0.36	0.36	
Clearance Time (s)	4.0	4.2		4.0	4.2		4.2	4.2	4.2	4.2	4.2	
Vehicle Extension (s)	2.0	4.8		2.0	4.8		4.8	4.8	4.8	4.8	4.8	
Lane Grp Cap (vph)	171	1561		94	1383		463	673	572	120	633	
v/s Ratio Prot	0.04	c0.15		c0.03	0.10			c0.29			0.05	
v/s Ratio Perm							0.18		0.07	0.07		
v/c Ratio	0.40	0.33		0.49	0.26		0.49	0.79	0.21	0.18	0.13	
Uniform Delay, d1	38.2	16.1		41.4	17.8		22.4	25.7	19.8	19.7	19.2	
Progression Factor	1.23	1.28		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.5	0.5		1.5	0.4		1.6	7.2	0.3	1.4	0.2	
Delay (s)	47.6	21.2		42.9	18.3		24.0	33.0	20.2	21.1	19.4	
Level of Service	D	C		D	B		C	C	C	C	B	
Approach Delay (s)		24.2			20.9			28.6			19.7	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM Average Control Delay	25.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.4
Intersection Capacity Utilization	51.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	50	409	38	119	418	0	0	61	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.2	4.2	4.2	4.2			4.2	
Lane Util. Factor					0.95	1.00	1.00	1.00			1.00	
Frt					1.00	0.85	1.00	1.00			0.99	
Flt Protected					0.99	1.00	0.95	1.00			1.00	
Satd. Flow (prot)					3520	1583	1770	1863			1845	
Flt Permitted					0.99	1.00	0.71	1.00			1.00	
Satd. Flow (perm)					3520	1583	1324	1863			1845	
Peak-hour factor, PHF	0.92	0.92	0.92	0.80	0.80	0.80	0.81	0.81	0.81	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	62	511	48	147	516	0	0	66	5
RTOR Reduction (vph)	0	0	0	0	0	30	0	0	0	0	3	0
Lane Group Flow (vph)	0	0	0	0	573	18	147	516	0	0	68	0
Turn Type				Perm		Perm	Perm					
Protected Phases					4			6			2	
Permitted Phases				4		4	6					
Actuated Green, G (s)					22.0	22.0	28.0	28.0			28.0	
Effective Green, g (s)					22.0	22.0	28.0	28.0			28.0	
Actuated g/C Ratio					0.38	0.38	0.48	0.48			0.48	
Clearance Time (s)					4.2	4.2	4.2	4.2			4.2	
Lane Grp Cap (vph)					1326	596	635	893			885	
v/s Ratio Prot								c0.28			0.04	
v/s Ratio Perm					0.16	0.01	0.11					
v/c Ratio					0.43	0.03	0.23	0.58			0.08	
Uniform Delay, d1					13.5	11.5	8.9	10.9			8.2	
Progression Factor					1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2					1.0	0.1	0.9	2.7			0.2	
Delay (s)					14.6	11.6	9.8	13.7			8.4	
Level of Service					B	B	A	B			A	
Approach Delay (s)		0.0			14.3			12.8			8.4	
Approach LOS		A			B			B			A	

Intersection Summary			
HCM Average Control Delay	13.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	58.4	Sum of lost time (s)	8.4
Intersection Capacity Utilization	79.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	6	553	9	26	15	0	0	57	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.4		5.4	5.4			5.4	
Lane Util. Factor					0.95		1.00	1.00			1.00	
Frt					1.00		1.00	1.00			0.97	
Flt Protected					1.00		0.95	1.00			1.00	
Satd. Flow (prot)					3565		1805	1900			1722	
Flt Permitted					1.00		0.71	1.00			1.00	
Satd. Flow (perm)					3565		1346	1900			1722	
Peak-hour factor, PHF	0.85	0.85	0.85	0.86	0.86	0.86	0.34	0.34	0.34	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	7	643	10	76	44	0	0	57	18
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	0	0	12	0
Lane Group Flow (vph)	0	0	0	0	658	0	76	44	0	0	63	0
Heavy Vehicles (%)	2%	2%	2%	0%	1%	0%	0%	0%	0%	0%	7%	6%
Turn Type				Perm			Perm					
Protected Phases					8			2			2	
Permitted Phases				8			2					
Actuated Green, G (s)					30.6		18.6	18.6			18.6	
Effective Green, g (s)					30.6		18.6	18.6			18.6	
Actuated g/C Ratio					0.51		0.31	0.31			0.31	
Clearance Time (s)					5.4		5.4	5.4			5.4	
Lane Grp Cap (vph)					1818		417	589			534	
v/s Ratio Prot								0.02			0.04	
v/s Ratio Perm					0.18		c0.06					
v/c Ratio					0.36		0.18	0.07			0.12	
Uniform Delay, d1					8.8		15.1	14.6			14.8	
Progression Factor					1.00		1.00	1.00			1.00	
Incremental Delay, d2					0.6		1.0	0.2			0.4	
Delay (s)					9.4		16.1	14.9			15.3	
Level of Service					A		B	B			B	
Approach Delay (s)		0.0			9.4			15.6			15.3	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM Average Control Delay	10.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.29		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.8
Intersection Capacity Utilization	60.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	30	531	36	75	46	0	0	44	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.2	4.2	4.2	4.2	4.2			4.2	
Lane Util. Factor				1.00	0.95	1.00	1.00	1.00			0.95	
Frt				1.00	1.00	0.85	1.00	1.00			0.90	
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (prot)				1770	3539	1583	1770	1863			3201	
Flt Permitted				0.95	1.00	1.00	0.67	1.00			1.00	
Satd. Flow (perm)				1770	3539	1583	1245	1863			3201	
Peak-hour factor, PHF	0.92	0.92	0.92	0.78	0.78	0.78	0.69	0.69	0.69	0.91	0.91	0.91
Adj. Flow (vph)	0	0	0	38	681	46	109	67	0	0	48	84
RTOR Reduction (vph)	0	0	0	0	0	22	0	0	0	0	57	0
Lane Group Flow (vph)	0	0	0	38	681	24	109	67	0	0	75	0
Turn Type				Perm		Perm	Perm					
Protected Phases					4			2			2	
Permitted Phases				4		4	2					
Actuated Green, G (s)				31.0	31.0	31.0	19.0	19.0			19.0	
Effective Green, g (s)				31.0	31.0	31.0	19.0	19.0			19.0	
Actuated g/C Ratio				0.53	0.53	0.53	0.33	0.33			0.33	
Clearance Time (s)				4.2	4.2	4.2	4.2	4.2			4.2	
Lane Grp Cap (vph)				940	1879	840	405	606			1041	
v/s Ratio Prot					c0.19			0.04			0.02	
v/s Ratio Perm				0.02		0.02	c0.09					
v/c Ratio				0.04	0.36	0.03	0.27	0.11			0.07	
Uniform Delay, d1				6.6	8.0	6.5	14.6	13.8			13.6	
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2				0.1	0.5	0.1	1.6	0.4			0.1	
Delay (s)				6.6	8.5	6.6	16.2	14.2			13.7	
Level of Service				A	A	A	B	B			B	
Approach Delay (s)		0.0			8.3			15.4			13.7	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM Average Control Delay	10.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	58.4	Sum of lost time (s)	8.4
Intersection Capacity Utilization	60.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	29	237	29	0	0	0	0	62	37	63	29	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2	4.2					4.2	4.2	4.6	4.6	
Lane Util. Factor	1.00	0.95	1.00					1.00	1.00	0.95	0.95	
Frt	1.00	1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00					1.00	1.00	0.95	0.98	
Satd. Flow (prot)	1770	3539	1583					1863	1583	1681	1735	
Flt Permitted	0.95	1.00	1.00					1.00	1.00	0.68	0.87	
Satd. Flow (perm)	1770	3539	1583					1863	1583	1204	1534	
Peak-hour factor, PHF	0.95	0.95	0.95	0.92	0.92	0.92	0.52	0.52	0.52	0.85	0.85	0.85
Adj. Flow (vph)	31	249	31	0	0	0	0	119	71	74	34	0
RTOR Reduction (vph)	0	0	21	0	0	0	0	0	55	0	0	0
Lane Group Flow (vph)	31	249	10	0	0	0	0	119	16	51	57	0
Turn Type	Perm		Perm						Perm	Perm		
Protected Phases		8						1			2	
Permitted Phases	8		8						1	2		
Actuated Green, G (s)	19.0	19.0	19.0					13.0	13.0	13.0	13.0	
Effective Green, g (s)	19.0	19.0	19.0					13.0	13.0	13.0	13.0	
Actuated g/C Ratio	0.33	0.33	0.33					0.22	0.22	0.22	0.22	
Clearance Time (s)	4.2	4.2	4.2					4.2	4.2	4.6	4.6	
Lane Grp Cap (vph)	580	1159	519					418	355	270	344	
v/s Ratio Prot		c0.07						c0.06				
v/s Ratio Perm	0.02		0.01						0.01	c0.04	0.04	
v/c Ratio	0.05	0.21	0.02					0.28	0.04	0.19	0.17	
Uniform Delay, d1	13.3	14.1	13.2					18.6	17.6	18.2	18.1	
Progression Factor	1.00	1.00	1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	0.4	0.1					1.7	0.2	1.5	1.0	
Delay (s)	13.5	14.5	13.3					20.4	17.9	19.8	19.2	
Level of Service	B	B	B					C	B	B	B	
Approach Delay (s)		14.3			0.0			19.4			19.5	
Approach LOS		B			A			B			B	

Intersection Summary			
HCM Average Control Delay	16.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.23		
Actuated Cycle Length (s)	58.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	60.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	34	329	0	0	66	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2			4.0	
Lane Util. Factor		0.95			0.97	
Frt		1.00			1.00	
Flt Protected		1.00			0.95	
Satd. Flow (prot)		3529			3303	
Flt Permitted		1.00			0.95	
Satd. Flow (perm)		3529			3303	
Peak-hour factor, PHF	0.86	0.86	0.85	0.85	0.83	0.83
Adj. Flow (vph)	40	383	0	0	80	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	423	0	0	80	0
Heavy Vehicles (%)	0%	2%	0%	0%	6%	0%
Turn Type	Perm					
Protected Phases		8			2	
Permitted Phases	8					
Actuated Green, G (s)		30.0			26.0	
Effective Green, g (s)		30.0			26.0	
Actuated g/C Ratio		0.47			0.40	
Clearance Time (s)		4.2			4.0	
Vehicle Extension (s)		3.0			3.0	
Lane Grp Cap (vph)		1649			1338	
v/s Ratio Prot					c0.02	
v/s Ratio Perm		0.12				
v/c Ratio		0.26			0.06	
Uniform Delay, d1		10.3			11.6	
Progression Factor		1.00			1.00	
Incremental Delay, d2		0.1			0.0	
Delay (s)		10.4			11.7	
Level of Service		B			B	
Approach Delay (s)		10.4	0.0		11.7	
Approach LOS		B	A		B	

Intersection Summary			
HCM Average Control Delay	10.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.17		
Actuated Cycle Length (s)	64.2	Sum of lost time (s)	8.2
Intersection Capacity Utilization	70.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	44	263	78	0	0	0	0	491	42	9	102	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2						4.2		4.2	4.2	
Lane Util. Factor		0.95						1.00		1.00	1.00	
Frt		0.97						0.99		1.00	1.00	
Flt Protected		0.99						1.00		0.95	1.00	
Satd. Flow (prot)		3412						1843		1770	1863	
Flt Permitted		0.99						1.00		0.25	1.00	
Satd. Flow (perm)		3412						1843		472	1863	
Peak-hour factor, PHF	0.76	0.76	0.76	0.92	0.92	0.92	0.86	0.86	0.86	0.87	0.87	0.87
Adj. Flow (vph)	58	346	103	0	0	0	0	571	49	10	117	0
RTOR Reduction (vph)	0	29	0	0	0	0	0	4	0	0	0	0
Lane Group Flow (vph)	0	478	0	0	0	0	0	616	0	10	117	0
Turn Type	Perm									Perm		
Protected Phases		8						6			2	
Permitted Phases	8									2		
Actuated Green, G (s)		22.1						28.8		28.8	28.8	
Effective Green, g (s)		22.1						28.8		28.8	28.8	
Actuated g/C Ratio		0.37						0.49		0.49	0.49	
Clearance Time (s)		4.2						4.2		4.2	4.2	
Vehicle Extension (s)		3.0						3.0		3.0	3.0	
Lane Grp Cap (vph)		1272						895		229	905	
v/s Ratio Prot								c0.33			0.06	
v/s Ratio Perm		0.14								0.02		
v/c Ratio		0.38						0.69		0.04	0.13	
Uniform Delay, d1		13.6						11.8		8.0	8.4	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		0.2						2.2		0.1	0.1	
Delay (s)		13.8						14.0		8.1	8.4	
Level of Service		B						B		A	A	
Approach Delay (s)		13.8			0.0			14.0			8.4	
Approach LOS		B			A			B			A	

Intersection Summary			
HCM Average Control Delay	13.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	59.3	Sum of lost time (s)	8.4
Intersection Capacity Utilization	79.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	120	276	64	61	317	48	126	359	90	62	176	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.2		4.1	4.2		4.1	4.2		4.1	4.2	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	
Frt	1.00	0.97		1.00	0.98		1.00	0.97		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3439		1770	3499		1770	3433		1770	1755	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3439		1770	3499		1770	3433		1770	1755	
Peak-hour factor, PHF	0.99	0.99	0.99	0.83	0.83	0.83	0.92	0.92	0.92	0.87	0.87	0.87
Adj. Flow (vph)	121	279	65	73	382	58	137	390	98	71	202	126
RTOR Reduction (vph)	0	18	0	0	12	0	0	15	0	0	16	0
Lane Group Flow (vph)	121	326	0	73	428	0	137	473	0	71	312	0
Heavy Vehicles (%)	2%	2%	2%	2%	1%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	12.9	29.5		8.7	25.3		13.9	48.6		8.6	43.3	
Effective Green, g (s)	12.9	29.5		8.7	25.3		13.9	48.6		8.6	43.3	
Actuated g/C Ratio	0.12	0.26		0.08	0.23		0.12	0.43		0.08	0.39	
Clearance Time (s)	4.1	4.2		4.1	4.2		4.1	4.2		4.1	4.2	
Vehicle Extension (s)	3.0	5.0		3.0	5.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	204	906		137	790		220	1490		136	678	
v/s Ratio Prot	c0.07	0.09		0.04	c0.12		c0.08	0.14		0.04	c0.18	
v/s Ratio Perm												
v/c Ratio	0.59	0.36		0.53	0.54		0.62	0.32		0.52	0.46	
Uniform Delay, d1	47.1	33.6		49.7	38.2		46.6	20.8		49.7	25.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.6	0.5		3.9	1.3		5.4	0.6		3.6	2.2	
Delay (s)	51.6	34.1		53.6	39.6		52.0	21.4		53.3	27.9	
Level of Service	D	C		D	D		D	C		D	C	
Approach Delay (s)		38.6			41.6			28.1			32.4	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM Average Control Delay	34.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	16.6
Intersection Capacity Utilization	53.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	16	90	11	37	191	102	22	149	43	99	160	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2		4.2	4.2		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.95		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3481		1770	3354		1770	1800		1770	1863	1583
Flt Permitted	0.55	1.00		0.68	1.00		0.64	1.00		0.58	1.00	1.00
Satd. Flow (perm)	1029	3481		1262	3354		1193	1800		1073	1863	1583
Peak-hour factor, PHF	0.86	0.86	0.86	0.89	0.89	0.89	0.76	0.76	0.76	0.86	0.86	0.86
Adj. Flow (vph)	19	105	13	42	215	115	29	196	57	115	186	48
RTOR Reduction (vph)	0	7	0	0	64	0	0	18	0	0	0	29
Lane Group Flow (vph)	19	111	0	42	266	0	29	235	0	115	186	19
Turn Type	Perm			Perm			Perm			Perm		Perm
Protected Phases		8			4			6			2	
Permitted Phases	8			4			6			2		2
Actuated Green, G (s)	25.0	25.0		25.0	25.0		23.0	23.0		23.0	23.0	23.0
Effective Green, g (s)	25.0	25.0		25.0	25.0		23.0	23.0		23.0	23.0	23.0
Actuated g/C Ratio	0.44	0.44		0.44	0.44		0.41	0.41		0.41	0.41	0.41
Clearance Time (s)	4.2	4.2		4.2	4.2		4.5	4.5		4.5	4.5	4.5
Lane Grp Cap (vph)	454	1535		556	1479		484	730		435	756	642
v/s Ratio Prot		0.03			c0.08			c0.13			0.10	
v/s Ratio Perm	0.02			0.03			0.02			0.11		0.01
v/c Ratio	0.04	0.07		0.08	0.18		0.06	0.32		0.26	0.25	0.03
Uniform Delay, d1	9.0	9.2		9.2	9.6		10.3	11.5		11.2	11.1	10.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.2	0.1		0.3	0.3		0.2	1.2		1.5	0.8	0.1
Delay (s)	9.2	9.2		9.4	9.9		10.5	12.7		12.7	11.9	10.2
Level of Service	A	A		A	A		B	B		B	B	B
Approach Delay (s)		9.2			9.8			12.5			11.9	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM Average Control Delay	11.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.25		
Actuated Cycle Length (s)	56.7	Sum of lost time (s)	8.7
Intersection Capacity Utilization	70.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	47	187	21	38	208	159	58	345	45	82	178	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.2		4.0	4.2		4.0	4.2		4.0	4.2	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	
Frt	1.00	0.99		1.00	0.94		1.00	0.98		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3486		1770	3328		1770	3478		1770	1803	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3486		1770	3328		1770	3478		1770	1803	
Peak-hour factor, PHF	0.86	0.86	0.86	0.78	0.78	0.78	0.87	0.87	0.87	0.94	0.94	0.94
Adj. Flow (vph)	55	217	24	49	267	204	67	397	52	87	189	51
RTOR Reduction (vph)	0	7	0	0	120	0	0	10	0	0	9	0
Lane Group Flow (vph)	55	234	0	49	351	0	67	439	0	87	231	0
Heavy Vehicles (%)	2%	2%	2%	2%	1%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	4.3	22.9		4.1	22.7		5.9	20.1		6.6	20.8	
Effective Green, g (s)	4.3	22.9		4.1	22.7		5.9	20.1		6.6	20.8	
Actuated g/C Ratio	0.06	0.33		0.06	0.32		0.08	0.29		0.09	0.30	
Clearance Time (s)	4.0	4.2		4.0	4.2		4.0	4.2		4.0	4.2	
Vehicle Extension (s)	2.0	5.0		2.0	5.0		2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	109	1139		104	1078		149	997		167	535	
v/s Ratio Prot	c0.03	0.07		0.03	c0.11		0.04	0.13		c0.05	c0.13	
v/s Ratio Perm												
v/c Ratio	0.50	0.21		0.47	0.33		0.45	0.44		0.52	0.43	
Uniform Delay, d1	31.9	17.0		32.0	17.9		30.6	20.4		30.2	19.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.3	0.2		1.2	0.4		0.8	0.7		1.4	1.2	
Delay (s)	33.2	17.2		33.2	18.3		31.3	21.1		31.6	21.1	
Level of Service	C	B		C	B		C	C		C	C	
Approach Delay (s)		20.2			19.7			22.4			23.9	
Approach LOS		C			B			C			C	

Intersection Summary			
HCM Average Control Delay	21.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	70.1	Sum of lost time (s)	12.2
Intersection Capacity Utilization	43.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	10	0	113	0	75	5	65	164	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.2		4.2	4.2	4.0	4.2	
Lane Util. Factor					1.00	1.00		1.00	1.00	1.00	1.00	
Frt					1.00	0.85		1.00	0.85	1.00	1.00	
Flt Protected					0.95	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)					1770	1583		1863	1583	1770	1863	
Flt Permitted					0.95	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)					1770	1583		1863	1583	1770	1863	
Peak-hour factor, PHF	0.85	0.85	0.85	0.57	0.85	0.57	0.85	0.83	0.83	0.88	0.88	0.85
Adj. Flow (vph)	0	0	0	18	0	198	0	90	6	74	186	0
RTOR Reduction (vph)	0	0	0	0	0	135	0	0	4	0	0	0
Lane Group Flow (vph)	0	0	0	0	18	63	0	90	2	74	186	0
Turn Type				Prot		custom	Perm		Perm	Prot		
Protected Phases				4	8			6		5	2	
Permitted Phases						4	6		6			
Actuated Green, G (s)					15.6	15.4		16.0	16.0	4.6	24.6	
Effective Green, g (s)					15.6	15.4		16.0	16.0	4.6	24.6	
Actuated g/C Ratio					0.32	0.32		0.33	0.33	0.10	0.51	
Clearance Time (s)					4.0	4.2		4.2	4.2	4.0	4.2	
Vehicle Extension (s)					3.0	2.0		4.8	4.8	3.0	4.8	
Lane Grp Cap (vph)					570	504		616	523	168	947	
v/s Ratio Prot					0.01			0.05		c0.04	c0.10	
v/s Ratio Perm					0.00	c0.04			0.00			
v/c Ratio					0.03	0.12		0.15	0.00	0.44	0.20	
Uniform Delay, d1					11.2	11.7		11.4	10.9	20.7	6.5	
Progression Factor					1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2					0.0	0.0		0.2	0.0	1.8	0.2	
Delay (s)					11.3	11.8		11.6	10.9	22.5	6.7	
Level of Service					B	B		B	B	C	A	
Approach Delay (s)		0.0			11.7			11.6			11.2	
Approach LOS		A			B			B			B	

Intersection Summary			
HCM Average Control Delay	11.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.19		
Actuated Cycle Length (s)	48.4	Sum of lost time (s)	8.2
Intersection Capacity Utilization	21.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	64	6	8	113	6	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.2	4.2
Lane Util. Factor	1.00		1.00	1.00	1.00	1.00
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	1795		1805	1900	1805	1615
Flt Permitted	1.00		0.71	1.00	0.95	1.00
Satd. Flow (perm)	1795		1343	1900	1805	1615
Peak-hour factor, PHF	0.92	0.92	0.66	0.66	1.00	1.00
Adj. Flow (vph)	70	7	12	171	6	11
RTOR Reduction (vph)	4	0	0	0	0	7
Lane Group Flow (vph)	74	0	12	171	6	4
Heavy Vehicles (%)	5%	0%	0%	0%	0%	0%
Turn Type			Perm			Perm
Protected Phases	8			4	6	
Permitted Phases			4			6
Actuated Green, G (s)	30.0		30.0	30.0	21.8	21.8
Effective Green, g (s)	30.0		30.0	30.0	21.8	21.8
Actuated g/C Ratio	0.50		0.50	0.50	0.36	0.36
Clearance Time (s)	4.0		4.0	4.0	4.2	4.2
Lane Grp Cap (vph)	898		672	950	656	587
v/s Ratio Prot	0.04			c0.09	c0.00	
v/s Ratio Perm			0.01			0.00
v/c Ratio	0.08		0.02	0.18	0.01	0.01
Uniform Delay, d1	7.8		7.6	8.2	12.2	12.2
Progression Factor	1.00		1.34	1.28	1.00	1.00
Incremental Delay, d2	0.2		0.0	0.4	0.0	0.0
Delay (s)	8.0		10.2	11.0	12.2	12.2
Level of Service	A		B	B	B	B
Approach Delay (s)	8.0			10.9	12.2	
Approach LOS	A			B	B	

Intersection Summary			
HCM Average Control Delay	10.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.11		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.2
Intersection Capacity Utilization	47.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	47	39	32	20	60	37	40	300	22	9	197	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2		4.2	4.2		4.2	4.2		4.2	4.2	4.2
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.93		1.00	0.94		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1736		1770	1756		1770	1844		1770	1863	1583
Flt Permitted	0.67	1.00		0.70	1.00		0.62	1.00		0.47	1.00	1.00
Satd. Flow (perm)	1252	1736		1308	1756		1158	1844		880	1863	1583
Peak-hour factor, PHF	0.84	0.84	0.84	0.73	0.73	0.73	0.88	0.88	0.88	0.91	0.91	0.91
Adj. Flow (vph)	56	46	38	27	82	51	45	341	25	10	216	42
RTOR Reduction (vph)	0	24	0	0	32	0	0	4	0	0	0	22
Lane Group Flow (vph)	56	60	0	27	101	0	45	362	0	10	216	20
Turn Type	Perm			Perm			Perm			Perm		Perm
Protected Phases		8			4			6			2	
Permitted Phases	8			4			6			2		2
Actuated Green, G (s)	22.8	22.8		22.8	22.8		28.8	28.8		28.8	28.8	28.8
Effective Green, g (s)	22.8	22.8		22.8	22.8		28.8	28.8		28.8	28.8	28.8
Actuated g/C Ratio	0.38	0.38		0.38	0.38		0.48	0.48		0.48	0.48	0.48
Clearance Time (s)	4.2	4.2		4.2	4.2		4.2	4.2		4.2	4.2	4.2
Lane Grp Cap (vph)	476	660		497	667		556	885		422	894	760
v/s Ratio Prot		0.03			c0.06			c0.20			0.12	
v/s Ratio Perm	0.04			0.02			0.04			0.01		0.01
v/c Ratio	0.12	0.09		0.05	0.15		0.08	0.41		0.02	0.24	0.03
Uniform Delay, d1	12.1	11.9		11.8	12.2		8.4	10.1		8.2	9.2	8.2
Progression Factor	0.90	0.86		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.5	0.3		0.2	0.5		0.3	1.4		0.1	0.6	0.1
Delay (s)	11.4	10.5		12.0	12.7		8.7	11.5		8.3	9.8	8.3
Level of Service	B	B		B	B		A	B		A	A	A
Approach Delay (s)		10.9			12.6			11.2			9.5	
Approach LOS		B			B			B			A	

Intersection Summary			
HCM Average Control Delay	10.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.4
Intersection Capacity Utilization	72.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	42	539	14	2	747	43	14	8	10	68	8	71
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.77	0.77	0.77	0.73	0.73	0.73	0.82	0.82	0.82
Hourly flow rate (vph)	46	592	15	3	970	56	19	11	14	83	10	87
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			None							
Median storage veh)		2										
Upstream signal (ft)					400							
pX, platoon unblocked	0.84						0.84	0.84		0.84	0.84	0.84
vC, conflicting volume	1026			608			1274	1723	304	1411	1703	513
vC1, stage 1 conf vol							692	692		1003	1003	
vC2, stage 2 conf vol							582	1031		408	700	
vCu, unblocked vol	644			608			940	1477	304	1104	1453	32
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			100			94	96	98	74	97	90
cM capacity (veh/h)	785			967			336	274	692	317	297	867

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	46	395	213	3	647	379	44	179
Volume Left	46	0	0	3	0	0	19	83
Volume Right	0	0	15	0	0	56	14	87
cSH	785	1700	1700	967	1700	1700	375	455
Volume to Capacity	0.06	0.23	0.13	0.00	0.38	0.22	0.12	0.39
Queue Length 95th (ft)	5	0	0	0	0	0	10	46
Control Delay (s)	9.9	0.0	0.0	8.7	0.0	0.0	15.9	18.0
Lane LOS	A			A			C	C
Approach Delay (s)	0.7			0.0			15.9	18.0
Approach LOS							C	C

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	46.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	19	430	140	54	719	17	69	18	11	28	89	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.2		4.0	4.2		5.6	5.6		5.6	5.6	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	0.95	
Frt	1.00	0.96		1.00	1.00		1.00	0.94		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3409		1770	3527		1770	1756		1770	3463	
Flt Permitted	0.95	1.00		0.95	1.00		0.65	1.00		0.73	1.00	
Satd. Flow (perm)	1770	3409		1770	3527		1203	1756		1369	3463	
Peak-hour factor, PHF	0.91	0.91	0.91	0.94	0.94	0.94	0.84	0.84	0.84	0.62	0.62	0.62
Adj. Flow (vph)	21	473	154	57	765	18	82	21	13	45	144	24
RTOR Reduction (vph)	0	35	0	0	2	0	0	9	0	0	15	0
Lane Group Flow (vph)	21	592	0	57	781	0	82	25	0	45	153	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	12.0	32.8		17.0	37.8		26.4	26.4		26.4	26.4	
Effective Green, g (s)	12.0	32.8		17.0	37.8		26.4	26.4		26.4	26.4	
Actuated g/C Ratio	0.13	0.36		0.19	0.42		0.29	0.29		0.29	0.29	
Clearance Time (s)	4.0	4.2		4.0	4.2		5.6	5.6		5.6	5.6	
Lane Grp Cap (vph)	236	1242		334	1481		353	515		402	1016	
v/s Ratio Prot	0.01	c0.17		0.03	c0.22			0.01			0.04	
v/s Ratio Perm							c0.07			0.03		
v/c Ratio	0.09	0.48		0.17	0.53		0.23	0.05		0.11	0.15	
Uniform Delay, d1	34.2	22.0		30.6	19.4		24.1	22.8		23.2	23.5	
Progression Factor	1.00	1.00		1.15	1.26		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	1.3		1.0	1.2		1.5	0.2		0.6	0.3	
Delay (s)	34.9	23.3		36.3	25.8		25.7	23.0		23.8	23.8	
Level of Service	C	C		D	C		C	C		C	C	
Approach Delay (s)		23.7			26.5			24.9			23.8	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	25.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	49.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	38	371	40	34	532	84	198	257	62	74	118	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.2		4.0	4.2		4.2	4.2	4.2	4.2	4.2	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	0.98		1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3488		1770	3467		1770	1863	1583	1770	1770	
Flt Permitted	0.95	1.00		0.95	1.00		0.53	1.00	1.00	0.40	1.00	
Satd. Flow (perm)	1770	3488		1770	3467		986	1863	1583	740	1770	
Peak-hour factor, PHF	0.91	0.91	0.91	0.80	0.80	0.80	0.87	0.87	0.87	0.85	0.85	0.85
Adj. Flow (vph)	42	408	44	42	665	105	228	295	71	87	139	69
RTOR Reduction (vph)	0	6	0	0	10	0	0	0	37	0	25	0
Lane Group Flow (vph)	42	446	0	42	760	0	228	295	34	87	183	0
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	6.1	46.6		4.7	45.2		26.3	26.3	26.3	26.3	26.3	
Effective Green, g (s)	6.1	46.6		4.7	45.2		26.3	26.3	26.3	26.3	26.3	
Actuated g/C Ratio	0.07	0.52		0.05	0.50		0.29	0.29	0.29	0.29	0.29	
Clearance Time (s)	4.0	4.2		4.0	4.2		4.2	4.2	4.2	4.2	4.2	
Vehicle Extension (s)	2.0	4.8		2.0	4.8		4.8	4.8	4.8	4.8	4.8	
Lane Grp Cap (vph)	120	1806		92	1741		288	544	463	216	517	
v/s Ratio Prot	c0.02	0.13		0.02	c0.22			0.16			0.10	
v/s Ratio Perm							c0.23		0.02	0.12		
v/c Ratio	0.35	0.25		0.46	0.44		0.79	0.54	0.07	0.40	0.35	
Uniform Delay, d1	40.1	12.0		41.4	14.3		29.3	26.8	23.0	25.5	25.1	
Progression Factor	0.56	0.62		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.6	0.3		1.3	0.8		15.5	1.8	0.1	2.4	0.8	
Delay (s)	23.2	7.7		42.7	15.1		44.8	28.6	23.2	27.9	25.9	
Level of Service	C	A		D	B		D	C	C	C	C	
Approach Delay (s)		9.1			16.5			34.2			26.5	
Approach LOS		A			B			C			C	

Intersection Summary			
HCM Average Control Delay	21.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.4
Intersection Capacity Utilization	57.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

APPENDIX D:
TECHNICAL CALCULATIONS –
BASELINE PLUS PROJECT CONDITIONS –
MALL OPEN TO TRAFFIC ALTERNATIVES

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	80	195	10	75	240	0	0	130	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.2	4.2	4.2	4.2			4.2	
Lane Util. Factor					0.95	1.00	1.00	1.00			1.00	
Frt					1.00	0.85	1.00	1.00			0.99	
Flt Protected					0.99	1.00	0.95	1.00			1.00	
Satd. Flow (prot)					3488	1583	1770	1863			1853	
Flt Permitted					0.99	1.00	0.66	1.00			1.00	
Satd. Flow (perm)					3488	1583	1225	1863			1853	
Peak-hour factor, PHF	0.92	0.92	0.92	0.81	0.81	0.81	0.93	0.93	0.93	0.86	0.86	0.86
Adj. Flow (vph)	0	0	0	99	241	12	81	258	0	0	151	6
RTOR Reduction (vph)	0	0	0	0	0	7	0	0	0	0	3	0
Lane Group Flow (vph)	0	0	0	0	340	5	81	258	0	0	154	0
Turn Type				Perm		Perm	Perm					
Protected Phases					4			6			2	
Permitted Phases				4		4	6					
Actuated Green, G (s)					22.0	22.0	28.0	28.0			28.0	
Effective Green, g (s)					22.0	22.0	28.0	28.0			28.0	
Actuated g/C Ratio					0.38	0.38	0.48	0.48			0.48	
Clearance Time (s)					4.2	4.2	4.2	4.2			4.2	
Lane Grp Cap (vph)					1314	596	587	893			888	
v/s Ratio Prot								c0.14			0.08	
v/s Ratio Perm					0.10	0.00	0.07					
v/c Ratio					0.26	0.01	0.14	0.29			0.17	
Uniform Delay, d1					12.6	11.4	8.5	9.2			8.6	
Progression Factor					1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2					0.5	0.0	0.5	0.8			0.4	
Delay (s)					13.0	11.4	9.0	10.0			9.1	
Level of Service					B	B	A	B			A	
Approach Delay (s)		0.0			13.0			9.8			9.1	
Approach LOS		A			B			A			A	

Intersection Summary			
HCM Average Control Delay	11.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	58.4	Sum of lost time (s)	8.4
Intersection Capacity Utilization	75.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	10	230	10	10	20	0	0	100	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.4		5.4	5.4			5.4	
Lane Util. Factor					0.95		1.00	1.00			1.00	
Frt					0.99		1.00	1.00			0.97	
Flt Protected					1.00		0.95	1.00			1.00	
Satd. Flow (prot)					3437		1805	1900			1788	
Flt Permitted					1.00		0.66	1.00			1.00	
Satd. Flow (perm)					3437		1254	1900			1788	
Peak-hour factor, PHF	0.85	0.85	0.85	1.00	1.00	1.00	0.64	0.64	0.64	0.85	0.85	0.85
Adj. Flow (vph)	0	0	0	10	230	10	16	31	0	0	118	35
RTOR Reduction (vph)	0	0	0	0	5	0	0	0	0	0	18	0
Lane Group Flow (vph)	0	0	0	0	245	0	16	31	0	0	135	0
Heavy Vehicles (%)	2%	2%	2%	0%	4%	13%	0%	0%	0%	0%	3%	3%
Turn Type				Perm			Perm					
Protected Phases					8			2			2	
Permitted Phases				8			2					
Actuated Green, G (s)					30.6		18.6	18.6			18.6	
Effective Green, g (s)					30.6		18.6	18.6			18.6	
Actuated g/C Ratio					0.51		0.31	0.31			0.31	
Clearance Time (s)					5.4		5.4	5.4			5.4	
Lane Grp Cap (vph)					1753		389	589			554	
v/s Ratio Prot								0.02			c0.08	
v/s Ratio Perm					0.07		0.01					
v/c Ratio					0.14		0.04	0.05			0.24	
Uniform Delay, d1					7.8		14.5	14.5			15.5	
Progression Factor					1.00		1.00	1.00			1.00	
Incremental Delay, d2					0.2		0.2	0.2			1.0	
Delay (s)					7.9		14.7	14.7			16.5	
Level of Service					A		B	B			B	
Approach Delay (s)		0.0			7.9			14.7			16.5	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM Average Control Delay	11.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.18		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.8
Intersection Capacity Utilization	70.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	115	235	5	5	40	0	0	100	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.2	4.2	4.2	4.2	4.2			4.2	
Lane Util. Factor				1.00	0.95	1.00	1.00	1.00			0.95	
Frt				1.00	1.00	0.85	1.00	1.00			0.95	
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (prot)				1770	3539	1583	1770	1863			3375	
Flt Permitted				0.95	1.00	1.00	0.64	1.00			1.00	
Satd. Flow (perm)				1770	3539	1583	1199	1863			3375	
Peak-hour factor, PHF	0.92	0.92	0.92	0.96	0.96	0.96	0.58	0.58	0.58	0.85	0.85	0.85
Adj. Flow (vph)	0	0	0	120	245	5	9	69	0	0	118	53
RTOR Reduction (vph)	0	0	0	0	0	2	0	0	0	0	36	0
Lane Group Flow (vph)	0	0	0	120	245	3	9	69	0	0	135	0
Turn Type				Perm		Perm	Perm					
Protected Phases					4			2			2	
Permitted Phases				4		4	2					
Actuated Green, G (s)				31.0	31.0	31.0	19.0	19.0			19.0	
Effective Green, g (s)				31.0	31.0	31.0	19.0	19.0			19.0	
Actuated g/C Ratio				0.53	0.53	0.53	0.33	0.33			0.33	
Clearance Time (s)				4.2	4.2	4.2	4.2	4.2			4.2	
Lane Grp Cap (vph)				940	1879	840	390	606			1098	
v/s Ratio Prot					c0.07			0.04			c0.04	
v/s Ratio Perm				0.07		0.00	0.01					
v/c Ratio				0.13	0.13	0.00	0.02	0.11			0.12	
Uniform Delay, d1				6.9	6.9	6.4	13.4	13.8			13.8	
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2				0.3	0.1	0.0	0.1	0.4			0.2	
Delay (s)				7.2	7.0	6.4	13.5	14.2			14.1	
Level of Service				A	A	A	B	B			B	
Approach Delay (s)		0.0			7.1			14.1			14.1	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM Average Control Delay	9.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.13		
Actuated Cycle Length (s)	58.4	Sum of lost time (s)	8.4
Intersection Capacity Utilization	62.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	510	50	0	0	0	0	15	10	100	100	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2	4.2					4.2	4.2	4.6	4.6	
Lane Util. Factor	1.00	0.95	1.00					1.00	1.00	0.95	0.95	
Frt	1.00	1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3539	1583					1863	1583	1681	1761	
Flt Permitted	0.95	1.00	1.00					1.00	1.00	0.74	0.98	
Satd. Flow (perm)	1770	3539	1583					1863	1583	1317	1729	
Peak-hour factor, PHF	0.96	0.96	0.96	0.92	0.92	0.92	0.75	0.75	0.75	0.80	0.80	0.80
Adj. Flow (vph)	52	531	52	0	0	0	0	20	13	125	125	0
RTOR Reduction (vph)	0	0	35	0	0	0	0	0	10	0	0	0
Lane Group Flow (vph)	52	531	17	0	0	0	0	20	3	112	138	0
Turn Type	Perm		Perm						Perm	Perm		
Protected Phases		8						1			2	
Permitted Phases	8		8						1	2		
Actuated Green, G (s)	19.0	19.0	19.0					13.0	13.0	13.0	13.0	
Effective Green, g (s)	19.0	19.0	19.0					13.0	13.0	13.0	13.0	
Actuated g/C Ratio	0.33	0.33	0.33					0.22	0.22	0.22	0.22	
Clearance Time (s)	4.2	4.2	4.2					4.2	4.2	4.6	4.6	
Lane Grp Cap (vph)	580	1159	519					418	355	295	388	
v/s Ratio Prot		c0.15						c0.01				
v/s Ratio Perm	0.03		0.01						0.00	c0.09	0.08	
v/c Ratio	0.09	0.46	0.03					0.05	0.01	0.38	0.36	
Uniform Delay, d1	13.5	15.4	13.3					17.6	17.5	19.1	19.0	
Progression Factor	1.00	1.00	1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	1.3	0.1					0.2	0.0	3.7	2.5	
Delay (s)	13.8	16.7	13.4					17.9	17.5	22.8	21.5	
Level of Service	B	B	B					B	B	C	C	
Approach Delay (s)		16.2			0.0			17.7			22.1	
Approach LOS		B			A			B			C	

Intersection Summary			
HCM Average Control Delay	17.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	58.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	62.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	530	10	0	0	0	0	10	10	65	20	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2						4.0		4.0	4.0	
Lane Util. Factor		0.95						1.00		1.00	1.00	
Frt		1.00						0.93		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		3495						1737		1719	1863	
Flt Permitted		1.00						1.00		0.74	1.00	
Satd. Flow (perm)		3495						1737		1342	1863	
Peak-hour factor, PHF	0.77	0.77	0.85	0.85	0.25	0.25	0.85	0.85	0.85	1.00	0.85	1.00
Adj. Flow (vph)	19	688	12	0	0	0	0	12	12	65	24	0
RTOR Reduction (vph)	0	1	0	0	0	0	0	7	0	0	0	0
Lane Group Flow (vph)	0	718	0	0	0	0	0	17	0	65	24	0
Heavy Vehicles (%)	0%	3%	2%	2%	0%	0%	2%	2%	2%	5%	2%	0%
Turn Type	Perm									Perm		
Protected Phases		8						2			6	
Permitted Phases	8									6		
Actuated Green, G (s)		30.0						26.0		26.0	26.0	
Effective Green, g (s)		30.0						26.0		26.0	26.0	
Actuated g/C Ratio		0.47						0.40		0.40	0.40	
Clearance Time (s)		4.2						4.0		4.0	4.0	
Vehicle Extension (s)		3.0						3.0		3.0	3.0	
Lane Grp Cap (vph)		1633						703		543	754	
v/s Ratio Prot								0.01			0.01	
v/s Ratio Perm		0.21								c0.05		
v/c Ratio		0.44						0.02		0.12	0.03	
Uniform Delay, d1		11.5						11.5		11.9	11.5	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		0.2						0.0		0.1	0.0	
Delay (s)		11.7						11.5		12.0	11.5	
Level of Service		B						B		B	B	
Approach Delay (s)		11.7			0.0			11.5			11.9	
Approach LOS		B			A			B			B	

Intersection Summary			
HCM Average Control Delay	11.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.29		
Actuated Cycle Length (s)	64.2	Sum of lost time (s)	8.2
Intersection Capacity Utilization	70.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	425	100	0	0	0	0	275	45	20	190	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2						4.2		4.2	4.2	
Lane Util. Factor		0.95						1.00		1.00	1.00	
Frt		0.97						0.98		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		3432						1828		1770	1863	
Flt Permitted		1.00						1.00		0.49	1.00	
Satd. Flow (perm)		3432						1828		905	1863	
Peak-hour factor, PHF	0.85	0.85	0.85	0.92	0.92	0.92	0.91	0.91	0.91	0.87	0.87	0.87
Adj. Flow (vph)	53	500	118	0	0	0	0	302	49	23	218	0
RTOR Reduction (vph)	0	23	0	0	0	0	0	8	0	0	0	0
Lane Group Flow (vph)	0	648	0	0	0	0	0	343	0	23	218	0
Turn Type	Perm									Perm		
Protected Phases		8						6			2	
Permitted Phases	8									2		
Actuated Green, G (s)		22.1						27.0		27.0	27.0	
Effective Green, g (s)		22.1						27.0		27.0	27.0	
Actuated g/C Ratio		0.38						0.47		0.47	0.47	
Clearance Time (s)		4.2						4.2		4.2	4.2	
Vehicle Extension (s)		3.0						3.0		3.0	3.0	
Lane Grp Cap (vph)		1319						858		425	875	
v/s Ratio Prot								c0.19			0.12	
v/s Ratio Perm		0.19								0.03		
v/c Ratio		0.49						0.40		0.05	0.25	
Uniform Delay, d1		13.4						10.0		8.3	9.2	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		0.3						0.3		0.1	0.2	
Delay (s)		13.7						10.3		8.4	9.3	
Level of Service		B						B		A	A	
Approach Delay (s)		13.7			0.0			10.3			9.2	
Approach LOS		B			A			B			A	

Intersection Summary			
HCM Average Control Delay	11.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	57.5	Sum of lost time (s)	8.4
Intersection Capacity Utilization	75.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	600	10	10	350	10	10	10	10	10	10	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	1.00		1.00	1.00			0.95			0.93	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.99	
Satd. Flow (prot)	1770	3530		1770	3524			1750			1716	
Flt Permitted	0.50	1.00		0.38	1.00			0.87			0.90	
Satd. Flow (perm)	940	3530		705	3524			1548			1569	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	12	706	12	12	412	12	12	12	12	12	12	24
RTOR Reduction (vph)	0	1	0	0	2	0	0	10	0	0	21	0
Lane Group Flow (vph)	12	717	0	12	422	0	0	26	0	0	27	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	14.1	14.1		14.1	14.1			3.6			3.6	
Effective Green, g (s)	14.1	14.1		14.1	14.1			3.6			3.6	
Actuated g/C Ratio	0.55	0.55		0.55	0.55			0.14			0.14	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	516	1937		387	1933			217			220	
v/s Ratio Prot		c0.20			0.12							
v/s Ratio Perm	0.01			0.02				0.02			c0.02	
v/c Ratio	0.02	0.37		0.03	0.22			0.12			0.12	
Uniform Delay, d1	2.7	3.3		2.7	3.0			9.7			9.7	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.0	0.1		0.0	0.1			0.2			0.3	
Delay (s)	2.7	3.4		2.7	3.0			9.9			9.9	
Level of Service	A	A		A	A			A			A	
Approach Delay (s)		3.4			3.0			9.9			9.9	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM Average Control Delay	3.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	25.7	Sum of lost time (s)	8.0
Intersection Capacity Utilization	26.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	120	410	90	60	220	60	100	250	180	70	150	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.2		4.1	4.2		4.1	4.2		4.1	4.2	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	
Frt	1.00	0.97		1.00	0.97		1.00	0.94		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3443		1770	3452		1770	3317		1770	1788	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3443		1770	3452		1770	3317		1770	1788	
Peak-hour factor, PHF	0.96	0.96	0.96	0.80	0.80	0.80	0.85	0.85	0.85	0.84	0.84	0.84
Adj. Flow (vph)	125	427	94	75	275	75	118	294	212	83	179	65
RTOR Reduction (vph)	0	17	0	0	23	0	0	92	0	0	9	0
Lane Group Flow (vph)	125	504	0	75	327	0	118	414	0	83	235	0
Heavy Vehicles (%)	2%	2%	2%	2%	1%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	13.2	29.3		8.9	25.0		12.8	47.9		9.3	44.4	
Effective Green, g (s)	13.2	29.3		8.9	25.0		12.8	47.9		9.3	44.4	
Actuated g/C Ratio	0.12	0.26		0.08	0.22		0.11	0.43		0.08	0.40	
Clearance Time (s)	4.1	4.2		4.1	4.2		4.1	4.2		4.1	4.2	
Vehicle Extension (s)	3.0	5.0		3.0	5.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	209	901		141	771		202	1419		147	709	
v/s Ratio Prot	c0.07	c0.15		0.04	0.09		c0.07	c0.12		0.05	c0.13	
v/s Ratio Perm												
v/c Ratio	0.60	0.56		0.53	0.42		0.58	0.29		0.56	0.33	
Uniform Delay, d1	46.9	35.8		49.5	37.3		47.1	21.0		49.4	23.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.6	1.3		3.8	0.8		4.3	0.5		4.9	1.3	
Delay (s)	51.4	37.1		53.4	38.1		51.3	21.5		54.3	24.7	
Level of Service	D	D		D	D		D	C		D	C	
Approach Delay (s)		39.8			40.8			27.1			32.2	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM Average Control Delay	34.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	16.6
Intersection Capacity Utilization	49.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	100	10	40	110	75	15	120	30	190	190	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2		4.2	4.2		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.94		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3492		1770	3324		1770	1808		1770	1863	1583
Flt Permitted	0.61	1.00		0.67	1.00		0.57	1.00		0.65	1.00	1.00
Satd. Flow (perm)	1144	3492		1242	3324		1064	1808		1208	1863	1583
Peak-hour factor, PHF	0.82	0.82	0.82	0.84	0.84	0.84	0.87	0.87	0.87	0.74	0.74	0.74
Adj. Flow (vph)	37	122	12	48	131	89	17	138	34	257	257	27
RTOR Reduction (vph)	0	7	0	0	50	0	0	15	0	0	0	16
Lane Group Flow (vph)	37	127	0	48	170	0	17	157	0	257	257	11
Turn Type	Perm			Perm			Perm			Perm		Perm
Protected Phases		8			4			6			2	
Permitted Phases	8			4			6			2		2
Actuated Green, G (s)	25.0	25.0		25.0	25.0		23.0	23.0		23.0	23.0	23.0
Effective Green, g (s)	25.0	25.0		25.0	25.0		23.0	23.0		23.0	23.0	23.0
Actuated g/C Ratio	0.44	0.44		0.44	0.44		0.41	0.41		0.41	0.41	0.41
Clearance Time (s)	4.2	4.2		4.2	4.2		4.5	4.5		4.5	4.5	4.5
Lane Grp Cap (vph)	504	1540		548	1466		432	733		490	756	642
v/s Ratio Prot		0.04			c0.05			0.09			0.14	
v/s Ratio Perm	0.03			0.04			0.02			c0.21		0.01
v/c Ratio	0.07	0.08		0.09	0.12		0.04	0.21		0.52	0.34	0.02
Uniform Delay, d1	9.2	9.2		9.2	9.3		10.2	11.0		12.7	11.6	10.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.3	0.1		0.3	0.2		0.2	0.7		4.0	1.2	0.0
Delay (s)	9.4	9.3		9.5	9.5		10.3	11.6		16.7	12.8	10.1
Level of Service	A	A		A	A		B	B		B	B	B
Approach Delay (s)		9.3			9.5			11.5			14.5	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM Average Control Delay	12.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	56.7	Sum of lost time (s)	8.7
Intersection Capacity Utilization	74.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	280	10	10	250	10	10	10	10	10	10	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	0.99		1.00	0.99			0.95			0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.98	
Satd. Flow (prot)	1770	3521		1770	3518			1750			1750	
Flt Permitted	0.67	1.00		0.67	1.00			1.00			1.00	
Satd. Flow (perm)	1242	3521		1242	3518			1779			1779	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	12	329	12	12	294	12	12	12	12	12	12	12
RTOR Reduction (vph)	0	4	0	0	5	0	0	10	0	0	10	0
Lane Group Flow (vph)	12	337	0	12	301	0	0	26	0	0	26	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	6.0	6.0		6.0	6.0			2.1			2.1	
Effective Green, g (s)	6.0	6.0		6.0	6.0			2.1			2.1	
Actuated g/C Ratio	0.37	0.37		0.37	0.37			0.13			0.13	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	463	1312		463	1311			232			232	
v/s Ratio Prot		c0.10			0.09							
v/s Ratio Perm	0.01			0.01				c0.01			0.01	
v/c Ratio	0.03	0.26		0.03	0.23			0.11			0.11	
Uniform Delay, d1	3.2	3.5		3.2	3.5			6.2			6.2	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.0	0.1		0.0	0.1			0.2			0.2	
Delay (s)	3.2	3.6		3.2	3.6			6.4			6.4	
Level of Service	A	A		A	A			A			A	
Approach Delay (s)		3.6			3.5			6.4			6.4	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM Average Control Delay	3.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.22		
Actuated Cycle Length (s)	16.1	Sum of lost time (s)	8.0
Intersection Capacity Utilization	18.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	70	210	20	35	170	155	55	370	55	85	105	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.2		4.0	4.2		4.0	4.2		4.0	4.2	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	
Frt	1.00	0.99		1.00	0.93		1.00	0.98		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3493		1770	3303		1770	3470		1770	1773	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3493		1770	3303		1770	3470		1770	1773	
Peak-hour factor, PHF	0.74	0.74	0.74	0.74	0.74	0.74	0.89	0.89	0.89	0.96	0.96	0.96
Adj. Flow (vph)	95	284	27	47	230	209	62	416	62	89	109	52
RTOR Reduction (vph)	0	6	0	0	143	0	0	11	0	0	16	0
Lane Group Flow (vph)	95	305	0	47	296	0	62	467	0	89	145	0
Heavy Vehicles (%)	2%	2%	2%	2%	1%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	7.0	26.5		4.2	23.7		4.6	21.4		6.8	23.6	
Effective Green, g (s)	7.0	26.5		4.2	23.7		4.6	21.4		6.8	23.6	
Actuated g/C Ratio	0.09	0.35		0.06	0.31		0.06	0.28		0.09	0.31	
Clearance Time (s)	4.0	4.2		4.0	4.2		4.0	4.2		4.0	4.2	
Vehicle Extension (s)	2.0	5.0		2.0	5.0		2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	165	1229		99	1040		108	986		160	556	
v/s Ratio Prot	c0.05	c0.09		0.03	c0.09		0.04	c0.13		c0.05	0.08	
v/s Ratio Perm												
v/c Ratio	0.58	0.25		0.47	0.28		0.57	0.47		0.56	0.26	
Uniform Delay, d1	32.7	17.3		34.5	19.4		34.4	22.3		32.8	19.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.0	0.2		1.3	0.3		4.5	0.8		2.4	0.5	
Delay (s)	35.7	17.5		35.8	19.7		38.9	23.0		35.2	19.8	
Level of Service	D	B		D	B		D	C		D	B	
Approach Delay (s)		21.8			21.3			24.9			25.3	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	23.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	75.3	Sum of lost time (s)	20.6
Intersection Capacity Utilization	43.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	5	0	145	0	160	15	85	100	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.2		4.2	4.2	4.0	4.2	
Lane Util. Factor					1.00	1.00		1.00	1.00	1.00	1.00	
Frt					1.00	0.85		1.00	0.85	1.00	1.00	
Flt Protected					0.95	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)					1770	1583		1863	1583	1770	1863	
Flt Permitted					0.95	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)					1770	1583		1863	1583	1770	1863	
Peak-hour factor, PHF	0.85	0.85	0.85	0.59	0.85	0.59	0.85	0.80	0.80	0.80	0.80	0.85
Adj. Flow (vph)	0	0	0	8	0	246	0	200	19	106	125	0
RTOR Reduction (vph)	0	0	0	0	0	189	0	0	12	0	0	0
Lane Group Flow (vph)	0	0	0	0	8	57	0	200	7	106	125	0
Turn Type				Perm		custom	Perm		Perm	Prot		
Protected Phases					8			6		5	2	
Permitted Phases				8		4	6		6			
Actuated Green, G (s)					9.9	9.7		15.1	15.1	4.9	24.0	
Effective Green, g (s)					9.9	9.7		15.1	15.1	4.9	24.0	
Actuated g/C Ratio					0.24	0.23		0.36	0.36	0.12	0.57	
Clearance Time (s)					4.0	4.2		4.2	4.2	4.0	4.2	
Vehicle Extension (s)					3.0	2.0		4.8	4.8	3.0	4.8	
Lane Grp Cap (vph)					416	365		668	568	206	1062	
v/s Ratio Prot								c0.11		c0.06	0.07	
v/s Ratio Perm					0.00	c0.04			0.00			
v/c Ratio					0.02	0.16		0.30	0.01	0.51	0.12	
Uniform Delay, d1					12.4	12.9		9.7	8.7	17.5	4.2	
Progression Factor					1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2					0.0	0.1		0.5	0.0	2.2	0.1	
Delay (s)					12.4	13.0		10.2	8.7	19.6	4.3	
Level of Service					B	B		B	A	B	A	
Approach Delay (s)		0.0			13.0			10.1			11.3	
Approach LOS		A			B			B			B	

Intersection Summary			
HCM Average Control Delay	11.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.29		
Actuated Cycle Length (s)	42.1	Sum of lost time (s)	12.4
Intersection Capacity Utilization	27.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	90	10	10	40	10	10	10	20	10	10	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.2	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frt	1.00	0.99		1.00	0.97		1.00	0.91			0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.98	
Satd. Flow (prot)	1770	1823		1805	1826		1583	1709			1750	
Flt Permitted	0.72	1.00		0.66	1.00		0.73	1.00			0.94	
Satd. Flow (perm)	1347	1823		1254	1826		1223	1709			1678	
Peak-hour factor, PHF	0.85	0.65	0.65	1.00	1.00	0.85	1.00	0.85	1.00	0.85	0.85	0.85
Adj. Flow (vph)	12	138	15	10	40	12	10	12	20	12	12	12
RTOR Reduction (vph)	0	7	0	0	6	0	0	13	0	0	8	0
Lane Group Flow (vph)	12	147	0	10	46	0	10	19	0	0	28	0
Heavy Vehicles (%)	2%	3%	0%	0%	0%	2%	14%	2%	0%	2%	2%	2%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		8			4			2			6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	30.0	30.0		30.0	30.0		22.0	22.0			21.8	
Effective Green, g (s)	30.0	30.0		30.0	30.0		22.0	22.0			21.8	
Actuated g/C Ratio	0.50	0.50		0.50	0.50		0.37	0.37			0.36	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.2	
Lane Grp Cap (vph)	674	912		627	913		448	627			610	
v/s Ratio Prot		c0.08			0.03			0.01				
v/s Ratio Perm	0.01			0.01			0.01				c0.02	
v/c Ratio	0.02	0.16		0.02	0.05		0.02	0.03			0.05	
Uniform Delay, d1	7.6	8.2		7.6	7.7		12.1	12.2			12.4	
Progression Factor	1.00	1.00		0.86	0.84		1.00	1.00			1.00	
Incremental Delay, d2	0.0	0.4		0.0	0.1		0.1	0.1			0.1	
Delay (s)	7.6	8.5		6.6	6.6		12.2	12.3			12.5	
Level of Service	A	A		A	A		B	B			B	
Approach Delay (s)		8.5			6.6			12.3			12.5	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM Average Control Delay	9.1	HCM Level of Service	A
HCM Volume to Capacity ratio	0.11		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.2
Intersection Capacity Utilization	47.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	55	5	10	30	15	30	455	55	5	100	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2		4.2	4.2		4.2	4.2		4.2	4.2	4.2
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.95		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1839		1770	1768		1770	1833		1770	1863	1583
Flt Permitted	0.71	1.00		0.70	1.00		0.67	1.00		0.29	1.00	1.00
Satd. Flow (perm)	1331	1839		1311	1768		1255	1833		535	1863	1583
Peak-hour factor, PHF	0.73	0.73	0.73	0.69	0.69	0.69	0.89	0.89	0.89	0.77	0.77	0.77
Adj. Flow (vph)	27	75	7	14	43	22	34	511	62	6	130	13
RTOR Reduction (vph)	0	4	0	0	14	0	0	7	0	0	0	7
Lane Group Flow (vph)	27	78	0	14	51	0	34	566	0	6	130	6
Turn Type	Perm			Perm			Perm			Perm		Perm
Protected Phases		8			4			6			2	
Permitted Phases	8			4			6			2		2
Actuated Green, G (s)	22.8	22.8		22.8	22.8		28.8	28.8		28.8	28.8	28.8
Effective Green, g (s)	22.8	22.8		22.8	22.8		28.8	28.8		28.8	28.8	28.8
Actuated g/C Ratio	0.38	0.38		0.38	0.38		0.48	0.48		0.48	0.48	0.48
Clearance Time (s)	4.2	4.2		4.2	4.2		4.2	4.2		4.2	4.2	4.2
Lane Grp Cap (vph)	506	699		498	672		602	880		257	894	760
v/s Ratio Prot		c0.04			0.03			c0.31			0.07	
v/s Ratio Perm	0.02			0.01			0.03			0.01		0.00
v/c Ratio	0.05	0.11		0.03	0.08		0.06	0.64		0.02	0.15	0.01
Uniform Delay, d1	11.8	12.0		11.7	11.9		8.3	11.7		8.2	8.7	8.1
Progression Factor	0.60	0.57		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.2	0.3		0.1	0.2		0.2	3.6		0.2	0.3	0.0
Delay (s)	7.3	7.2		11.8	12.1		8.5	15.3		8.4	9.1	8.2
Level of Service	A	A		B	B		A	B		A	A	A
Approach Delay (s)		7.2			12.0			15.0			9.0	
Approach LOS		A			B			B			A	

Intersection Summary			
HCM Average Control Delay	12.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.4
Intersection Capacity Utilization	72.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	70	560	10	5	380	70	20	10	5	30	15	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.83	0.83	0.83	0.92	0.92	0.92	0.78	0.78	0.78	0.89	0.89	0.89
Hourly flow rate (vph)	84	675	12	5	413	76	26	13	6	34	17	34
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					400							
pX, platoon unblocked	0.94						0.94	0.94		0.94	0.94	0.94
vC, conflicting volume	489			687			1109	1349	343	981	1317	245
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	333			687			991	1247	343	855	1213	73
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	93			99			84	91	99	84	89	96
cM capacity (veh/h)	1151			903			157	149	653	206	157	917

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	84	450	237	5	275	214	45	84
Volume Left	84	0	0	5	0	0	26	34
Volume Right	0	0	12	0	0	76	6	34
cSH	1151	1700	1700	903	1700	1700	173	274
Volume to Capacity	0.07	0.26	0.14	0.01	0.16	0.13	0.26	0.31
Queue Length 95th (ft)	6	0	0	0	0	0	25	32
Control Delay (s)	8.4	0.0	0.0	9.0	0.0	0.0	32.9	23.9
Lane LOS	A			A			D	C
Approach Delay (s)	0.9			0.1			32.9	23.9
Approach LOS							D	C

Intersection Summary			
Average Delay	3.0		
Intersection Capacity Utilization	33.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	450	110	15	390	15	60	40	5	20	20	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.2		4.0	4.2		5.6	5.6		5.6	5.6	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	0.95	
Frt	1.00	0.97		1.00	0.99		1.00	0.98		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3435		1770	3519		1770	1830		1770	3436	
Flt Permitted	0.95	1.00		0.95	1.00		0.74	1.00		0.72	1.00	
Satd. Flow (perm)	1770	3435		1770	3519		1371	1830		1337	3436	
Peak-hour factor, PHF	0.79	0.79	0.79	0.95	0.95	0.95	0.76	0.76	0.76	0.79	0.79	0.79
Adj. Flow (vph)	13	570	139	16	411	16	79	53	7	25	25	6
RTOR Reduction (vph)	0	24	0	0	3	0	0	5	0	0	4	0
Lane Group Flow (vph)	13	685	0	16	424	0	79	55	0	25	27	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	10.0	36.8		13.0	39.8		26.4	26.4		26.4	26.4	
Effective Green, g (s)	10.0	36.8		13.0	39.8		26.4	26.4		26.4	26.4	
Actuated g/C Ratio	0.11	0.41		0.14	0.44		0.29	0.29		0.29	0.29	
Clearance Time (s)	4.0	4.2		4.0	4.2		5.6	5.6		5.6	5.6	
Lane Grp Cap (vph)	197	1405		256	1556		402	537		392	1008	
v/s Ratio Prot	0.01	c0.20		c0.01	c0.12			0.03			0.01	
v/s Ratio Perm							c0.06			0.02		
v/c Ratio	0.07	0.49		0.06	0.27		0.20	0.10		0.06	0.03	
Uniform Delay, d1	35.8	19.6		33.2	15.9		23.8	23.2		22.9	22.6	
Progression Factor	1.00	1.00		0.83	1.04		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	1.2		0.5	0.4		1.1	0.4		0.3	0.0	
Delay (s)	36.5	20.9		27.9	16.9		24.9	23.6		23.2	22.7	
Level of Service	D	C		C	B		C	C		C	C	
Approach Delay (s)		21.1			17.3			24.3			22.9	
Approach LOS		C			B			C			C	

Intersection Summary			
HCM Average Control Delay	20.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	34.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	375	50	40	250	65	210	460	140	20	50	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.2		4.0	4.2		4.2	4.2	4.2	4.2	4.2	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	0.97		1.00	1.00	0.85	1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3477		1770	3430		1770	1863	1583	1770	1747	
Flt Permitted	0.95	1.00		0.95	1.00		0.69	1.00	1.00	0.18	1.00	
Satd. Flow (perm)	1770	3477		1770	3430		1279	1863	1583	339	1747	
Peak-hour factor, PHF	0.80	0.80	0.80	0.83	0.83	0.83	0.87	0.87	0.87	0.78	0.78	0.78
Adj. Flow (vph)	69	469	62	48	301	78	241	529	161	26	64	45
RTOR Reduction (vph)	0	9	0	0	23	0	0	0	40	0	29	0
Lane Group Flow (vph)	69	522	0	48	356	0	241	529	121	26	80	0
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	8.9	40.3		4.9	36.3		32.4	32.4	32.4	32.4	32.4	
Effective Green, g (s)	8.9	40.3		4.9	36.3		32.4	32.4	32.4	32.4	32.4	
Actuated g/C Ratio	0.10	0.45		0.05	0.40		0.36	0.36	0.36	0.36	0.36	
Clearance Time (s)	4.0	4.2		4.0	4.2		4.2	4.2	4.2	4.2	4.2	
Vehicle Extension (s)	2.0	4.8		2.0	4.8		4.8	4.8	4.8	4.8	4.8	
Lane Grp Cap (vph)	175	1557		96	1383		460	671	570	122	629	
v/s Ratio Prot	0.04	c0.15		c0.03	0.10			c0.28			0.05	
v/s Ratio Perm							0.19		0.08	0.08		
v/c Ratio	0.39	0.34		0.50	0.26		0.52	0.79	0.21	0.21	0.13	
Uniform Delay, d1	38.0	16.1		41.4	17.9		22.7	25.7	20.0	20.0	19.3	
Progression Factor	1.23	1.28		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.5	0.5		1.5	0.5		1.9	7.0	0.4	1.7	0.2	
Delay (s)	47.1	21.1		42.8	18.3		24.6	32.7	20.3	21.7	19.5	
Level of Service	D	C		D	B		C	C	C	C	B	
Approach Delay (s)		24.1			21.1			28.5			19.9	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM Average Control Delay	25.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.4
Intersection Capacity Utilization	51.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	50	410	40	110	420	0	0	55	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.2	4.2	4.2	4.2			4.2	
Lane Util. Factor					0.95	1.00	1.00	1.00			1.00	
Frt					1.00	0.85	1.00	1.00			0.99	
Flt Protected					0.99	1.00	0.95	1.00			1.00	
Satd. Flow (prot)					3520	1583	1770	1863			1843	
Flt Permitted					0.99	1.00	0.71	1.00			1.00	
Satd. Flow (perm)					3520	1583	1331	1863			1843	
Peak-hour factor, PHF	0.92	0.92	0.92	0.80	0.80	0.80	0.81	0.81	0.81	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	62	512	50	136	519	0	0	60	5
RTOR Reduction (vph)	0	0	0	0	0	31	0	0	0	0	3	0
Lane Group Flow (vph)	0	0	0	0	574	19	136	519	0	0	62	0
Turn Type				Perm		Perm	Perm					
Protected Phases					4			6			2	
Permitted Phases				4		4	6					
Actuated Green, G (s)					22.0	22.0	28.0	28.0			28.0	
Effective Green, g (s)					22.0	22.0	28.0	28.0			28.0	
Actuated g/C Ratio					0.38	0.38	0.48	0.48			0.48	
Clearance Time (s)					4.2	4.2	4.2	4.2			4.2	
Lane Grp Cap (vph)					1326	596	638	893			884	
v/s Ratio Prot								c0.28			0.03	
v/s Ratio Perm					0.16	0.01	0.10					
v/c Ratio					0.43	0.03	0.21	0.58			0.07	
Uniform Delay, d1					13.6	11.5	8.8	11.0			8.2	
Progression Factor					1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2					1.0	0.1	0.8	2.8			0.2	
Delay (s)					14.6	11.6	9.6	13.7			8.3	
Level of Service					B	B	A	B			A	
Approach Delay (s)		0.0			14.3			12.9			8.3	
Approach LOS		A			B			B			A	

Intersection Summary			
HCM Average Control Delay	13.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	58.4	Sum of lost time (s)	8.4
Intersection Capacity Utilization	79.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	10	550	10	30	20	0	0	65	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.4		5.4	5.4			5.4	
Lane Util. Factor					0.95		1.00	1.00			1.00	
Frt					1.00		1.00	1.00			0.97	
Flt Protected					1.00		0.95	1.00			1.00	
Satd. Flow (prot)					3563		1805	1900			1723	
Flt Permitted					1.00		0.70	1.00			1.00	
Satd. Flow (perm)					3563		1333	1900			1723	
Peak-hour factor, PHF	0.85	0.85	0.85	0.86	0.86	0.86	0.34	0.34	0.34	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	12	640	12	88	59	0	0	65	20
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	0	0	14	0
Lane Group Flow (vph)	0	0	0	0	662	0	88	59	0	0	71	0
Heavy Vehicles (%)	2%	2%	2%	0%	1%	0%	0%	0%	0%	0%	7%	6%
Turn Type				Perm			Perm					
Protected Phases					8			2			2	
Permitted Phases				8			2					
Actuated Green, G (s)					30.6		18.6	18.6			18.6	
Effective Green, g (s)					30.6		18.6	18.6			18.6	
Actuated g/C Ratio					0.51		0.31	0.31			0.31	
Clearance Time (s)					5.4		5.4	5.4			5.4	
Lane Grp Cap (vph)					1817		413	589			534	
v/s Ratio Prot								0.03			0.04	
v/s Ratio Perm					0.19		c0.07					
v/c Ratio					0.36		0.21	0.10			0.13	
Uniform Delay, d1					8.8		15.3	14.7			14.9	
Progression Factor					1.00		1.00	1.00			1.00	
Incremental Delay, d2					0.6		1.2	0.3			0.5	
Delay (s)					9.4		16.5	15.1			15.4	
Level of Service					A		B	B			B	
Approach Delay (s)		0.0			9.4			15.9			15.4	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM Average Control Delay	11.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.8
Intersection Capacity Utilization	70.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	30	530	35	75	45	0	0	45	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.2	4.2	4.2	4.2	4.2			4.2	
Lane Util. Factor				1.00	0.95	1.00	1.00	1.00			0.95	
Frt				1.00	1.00	0.85	1.00	1.00			0.91	
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (prot)				1770	3539	1583	1770	1863			3207	
Flt Permitted				0.95	1.00	1.00	0.67	1.00			1.00	
Satd. Flow (perm)				1770	3539	1583	1246	1863			3207	
Peak-hour factor, PHF	0.92	0.92	0.92	0.78	0.78	0.78	0.69	0.69	0.69	0.91	0.91	0.91
Adj. Flow (vph)	0	0	0	38	679	45	109	65	0	0	49	82
RTOR Reduction (vph)	0	0	0	0	0	21	0	0	0	0	55	0
Lane Group Flow (vph)	0	0	0	38	679	24	109	65	0	0	76	0
Turn Type				Perm		Perm	Perm					
Protected Phases					4			2			2	
Permitted Phases				4		4	2					
Actuated Green, G (s)				31.0	31.0	31.0	19.0	19.0			19.0	
Effective Green, g (s)				31.0	31.0	31.0	19.0	19.0			19.0	
Actuated g/C Ratio				0.53	0.53	0.53	0.33	0.33			0.33	
Clearance Time (s)				4.2	4.2	4.2	4.2	4.2			4.2	
Lane Grp Cap (vph)				940	1879	840	405	606			1043	
v/s Ratio Prot					c0.19			0.03			0.02	
v/s Ratio Perm				0.02		0.02	c0.09					
v/c Ratio				0.04	0.36	0.03	0.27	0.11			0.07	
Uniform Delay, d1				6.6	8.0	6.5	14.6	13.8			13.6	
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2				0.1	0.5	0.1	1.6	0.4			0.1	
Delay (s)				6.6	8.5	6.6	16.2	14.1			13.7	
Level of Service				A	A	A	B	B			B	
Approach Delay (s)		0.0			8.3			15.4			13.7	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM Average Control Delay	10.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	58.4	Sum of lost time (s)	8.4
Intersection Capacity Utilization	62.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	240	30	0	0	0	0	65	40	65	30	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2	4.2					4.2	4.2	4.6	4.6	
Lane Util. Factor	1.00	0.95	1.00					1.00	1.00	0.95	0.95	
Frt	1.00	1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00					1.00	1.00	0.95	0.98	
Satd. Flow (prot)	1770	3539	1583					1863	1583	1681	1734	
Flt Permitted	0.95	1.00	1.00					1.00	1.00	0.68	0.86	
Satd. Flow (perm)	1770	3539	1583					1863	1583	1198	1526	
Peak-hour factor, PHF	0.95	0.95	0.95	0.92	0.92	0.92	0.52	0.52	0.52	0.85	0.85	0.85
Adj. Flow (vph)	32	253	32	0	0	0	0	125	77	76	35	0
RTOR Reduction (vph)	0	0	22	0	0	0	0	0	60	0	0	0
Lane Group Flow (vph)	32	253	10	0	0	0	0	125	17	52	59	0
Turn Type	Perm		Perm						Perm	Perm		
Protected Phases		8						1			2	
Permitted Phases	8		8						1	2		
Actuated Green, G (s)	19.0	19.0	19.0					13.0	13.0	13.0	13.0	
Effective Green, g (s)	19.0	19.0	19.0					13.0	13.0	13.0	13.0	
Actuated g/C Ratio	0.33	0.33	0.33					0.22	0.22	0.22	0.22	
Clearance Time (s)	4.2	4.2	4.2					4.2	4.2	4.6	4.6	
Lane Grp Cap (vph)	580	1159	519					418	355	269	342	
v/s Ratio Prot		c0.07						c0.07				
v/s Ratio Perm	0.02		0.01						0.01	c0.04	0.04	
v/c Ratio	0.06	0.22	0.02					0.30	0.05	0.19	0.17	
Uniform Delay, d1	13.4	14.1	13.2					18.7	17.6	18.2	18.2	
Progression Factor	1.00	1.00	1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	0.4	0.1					1.8	0.3	1.6	1.1	
Delay (s)	13.5	14.6	13.3					20.5	17.9	19.8	19.3	
Level of Service	B	B	B					C	B	B	B	
Approach Delay (s)		14.3			0.0			19.5			19.5	
Approach LOS		B			A			B			B	

Intersection Summary			
HCM Average Control Delay	16.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.23		
Actuated Cycle Length (s)	58.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	62.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	325	10	0	0	0	0	10	10	70	10	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2						4.0		4.0	4.0	
Lane Util. Factor		0.95						1.00		1.00	1.00	
Frt		1.00						0.93		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		3514						1737		1703	1863	
Flt Permitted		1.00						1.00		0.74	1.00	
Satd. Flow (perm)		3514						1737		1329	1863	
Peak-hour factor, PHF	0.86	0.86	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.83	0.85	0.83
Adj. Flow (vph)	41	378	12	0	0	0	0	12	12	84	12	0
RTOR Reduction (vph)	0	2	0	0	0	0	0	7	0	0	0	0
Lane Group Flow (vph)	0	429	0	0	0	0	0	17	0	84	12	0
Heavy Vehicles (%)	0%	2%	2%	2%	0%	0%	2%	2%	2%	6%	2%	0%
Turn Type	Perm									Perm		
Protected Phases		8						2			6	
Permitted Phases	8									6		
Actuated Green, G (s)		30.0						26.0		26.0	26.0	
Effective Green, g (s)		30.0						26.0		26.0	26.0	
Actuated g/C Ratio		0.47						0.40		0.40	0.40	
Clearance Time (s)		4.2						4.0		4.0	4.0	
Vehicle Extension (s)		3.0						3.0		3.0	3.0	
Lane Grp Cap (vph)		1642						703		538	754	
v/s Ratio Prot								0.01			0.01	
v/s Ratio Perm		0.12								c0.06		
v/c Ratio		0.26						0.02		0.16	0.02	
Uniform Delay, d1		10.4						11.5		12.1	11.4	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		0.1						0.0		0.1	0.0	
Delay (s)		10.5						11.5		12.3	11.4	
Level of Service		B						B		B	B	
Approach Delay (s)		10.5			0.0			11.5			12.2	
Approach LOS		B			A			B			B	

Intersection Summary			
HCM Average Control Delay	10.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.21		
Actuated Cycle Length (s)	64.2	Sum of lost time (s)	8.2
Intersection Capacity Utilization	70.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	265	75	0	0	0	0	490	40	10	100	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2						4.2		4.2	4.2	
Lane Util. Factor		0.95						1.00		1.00	1.00	
Frt		0.97						0.99		1.00	1.00	
Flt Protected		0.99						1.00		0.95	1.00	
Satd. Flow (prot)		3416						1844		1770	1863	
Flt Permitted		0.99						1.00		0.26	1.00	
Satd. Flow (perm)		3416						1844		475	1863	
Peak-hour factor, PHF	0.76	0.76	0.76	0.92	0.92	0.92	0.86	0.86	0.86	0.87	0.87	0.87
Adj. Flow (vph)	59	349	99	0	0	0	0	570	47	11	115	0
RTOR Reduction (vph)	0	28	0	0	0	0	0	4	0	0	0	0
Lane Group Flow (vph)	0	479	0	0	0	0	0	613	0	11	115	0
Turn Type	Perm									Perm		
Protected Phases		8						6			2	
Permitted Phases	8									2		
Actuated Green, G (s)		22.1						28.7		28.7	28.7	
Effective Green, g (s)		22.1						28.7		28.7	28.7	
Actuated g/C Ratio		0.37						0.48		0.48	0.48	
Clearance Time (s)		4.2						4.2		4.2	4.2	
Vehicle Extension (s)		3.0						3.0		3.0	3.0	
Lane Grp Cap (vph)		1275						894		230	903	
v/s Ratio Prot								c0.33			0.06	
v/s Ratio Perm		0.14								0.02		
v/c Ratio		0.38						0.69		0.05	0.13	
Uniform Delay, d1		13.5						11.8		8.0	8.4	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		0.2						2.2		0.1	0.1	
Delay (s)		13.7						14.0		8.1	8.4	
Level of Service		B						B		A	A	
Approach Delay (s)		13.7			0.0			14.0			8.4	
Approach LOS		B			A			B			A	

Intersection Summary			
HCM Average Control Delay	13.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	59.2	Sum of lost time (s)	8.4
Intersection Capacity Utilization	79.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	440	10	10	540	10	10	10	10	10	10	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	1.00		1.00	1.00			0.95			0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.98	
Satd. Flow (prot)	1770	3527		1770	3529			1750			1750	
Flt Permitted	0.41	1.00		0.46	1.00			1.00			1.00	
Satd. Flow (perm)	756	3527		848	3529			1779			1779	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	12	518	12	12	635	12	12	12	12	12	12	12
RTOR Reduction (vph)	0	2	0	0	1	0	0	11	0	0	11	0
Lane Group Flow (vph)	12	528	0	12	646	0	0	25	0	0	25	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	15.6	15.6		15.6	15.6			2.1			2.1	
Effective Green, g (s)	15.6	15.6		15.6	15.6			2.1			2.1	
Actuated g/C Ratio	0.61	0.61		0.61	0.61			0.08			0.08	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	459	2141		515	2142			145			145	
v/s Ratio Prot		0.15			c0.18							
v/s Ratio Perm	0.02			0.01				c0.01			0.01	
v/c Ratio	0.03	0.25		0.02	0.30			0.17			0.17	
Uniform Delay, d1	2.0	2.3		2.0	2.4			11.0			11.0	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.0	0.1		0.0	0.1			0.6			0.6	
Delay (s)	2.0	2.4		2.0	2.5			11.6			11.6	
Level of Service	A	A		A	A			B			B	
Approach Delay (s)		2.4			2.5			11.6			11.6	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM Average Control Delay	3.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.29		
Actuated Cycle Length (s)	25.7	Sum of lost time (s)	8.0
Intersection Capacity Utilization	25.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	120	280	60	60	320	50	130	350	90	60	170	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.2		4.1	4.2		4.1	4.2		4.1	4.2	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	0.98		1.00	0.97		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3445		1770	3497		1770	1805		1770	1753	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3445		1770	3497		1770	1805		1770	1753	
Peak-hour factor, PHF	0.99	0.99	0.99	0.83	0.83	0.83	0.92	0.92	0.92	0.87	0.87	0.87
Adj. Flow (vph)	121	283	61	72	386	60	141	380	98	69	195	126
RTOR Reduction (vph)	0	16	0	0	12	0	0	6	0	0	17	0
Lane Group Flow (vph)	121	328	0	72	434	0	141	472	0	69	304	0
Heavy Vehicles (%)	2%	2%	2%	2%	1%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	12.9	29.5		8.7	25.3		14.1	48.7		8.5	43.1	
Effective Green, g (s)	12.9	29.5		8.7	25.3		14.1	48.7		8.5	43.1	
Actuated g/C Ratio	0.12	0.26		0.08	0.23		0.13	0.43		0.08	0.38	
Clearance Time (s)	4.1	4.2		4.1	4.2		4.1	4.2		4.1	4.2	
Vehicle Extension (s)	3.0	5.0		3.0	5.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	204	907		137	790		223	785		134	675	
v/s Ratio Prot	c0.07	0.10		0.04	c0.12		c0.08	c0.26		0.04	0.17	
v/s Ratio Perm												
v/c Ratio	0.59	0.36		0.53	0.55		0.63	0.60		0.51	0.45	
Uniform Delay, d1	47.1	33.6		49.7	38.3		46.5	24.2		49.8	25.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.6	0.5		3.6	1.4		5.7	3.4		3.3	2.2	
Delay (s)	51.6	34.1		53.3	39.7		52.2	27.6		53.1	27.8	
Level of Service	D	C		D	D		D	C		D	C	
Approach Delay (s)		38.7			41.6			33.2			32.3	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM Average Control Delay	36.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	12.4
Intersection Capacity Utilization	60.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	90	10	40	190	100	20	150	45	100	160	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2		4.2	4.2		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.95		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3485		1770	3356		1770	1798		1770	1863	1583
Flt Permitted	0.56	1.00		0.68	1.00		0.64	1.00		0.57	1.00	1.00
Satd. Flow (perm)	1034	3485		1263	3356		1193	1798		1066	1863	1583
Peak-hour factor, PHF	0.86	0.86	0.86	0.89	0.89	0.89	0.76	0.76	0.76	0.86	0.86	0.86
Adj. Flow (vph)	17	105	12	45	213	112	26	197	59	116	186	47
RTOR Reduction (vph)	0	7	0	0	63	0	0	19	0	0	0	28
Lane Group Flow (vph)	17	110	0	45	262	0	26	237	0	116	186	19
Turn Type	Perm			Perm			Perm			Perm		Perm
Protected Phases		8			4			6			2	
Permitted Phases	8			4			6			2		2
Actuated Green, G (s)	25.0	25.0		25.0	25.0		23.0	23.0		23.0	23.0	23.0
Effective Green, g (s)	25.0	25.0		25.0	25.0		23.0	23.0		23.0	23.0	23.0
Actuated g/C Ratio	0.44	0.44		0.44	0.44		0.41	0.41		0.41	0.41	0.41
Clearance Time (s)	4.2	4.2		4.2	4.2		4.5	4.5		4.5	4.5	4.5
Lane Grp Cap (vph)	456	1537		557	1480		484	729		432	756	642
v/s Ratio Prot		0.03			c0.08			c0.13			0.10	
v/s Ratio Perm	0.02			0.04			0.02			0.11		0.01
v/c Ratio	0.04	0.07		0.08	0.18		0.05	0.33		0.27	0.25	0.03
Uniform Delay, d1	9.0	9.2		9.2	9.6		10.2	11.5		11.2	11.1	10.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.2	0.1		0.3	0.3		0.2	1.2		1.5	0.8	0.1
Delay (s)	9.2	9.2		9.5	9.9		10.4	12.7		12.8	11.9	10.2
Level of Service	A	A		A	A		B	B		B	B	B
Approach Delay (s)		9.2			9.8			12.5			12.0	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM Average Control Delay	11.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.25		
Actuated Cycle Length (s)	56.7	Sum of lost time (s)	8.7
Intersection Capacity Utilization	70.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	240	10	10	300	10	10	10	10	10	10	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	0.99		1.00	1.00			0.95			0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.98	
Satd. Flow (prot)	1770	3518		1770	3522			1750			1750	
Flt Permitted	0.53	1.00		0.57	1.00			1.00			1.00	
Satd. Flow (perm)	995	3518		1066	3522			1779			1779	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	12	282	12	12	353	12	12	12	12	12	12	12
RTOR Reduction (vph)	0	4	0	0	3	0	0	11	0	0	11	0
Lane Group Flow (vph)	12	290	0	12	362	0	0	25	0	0	25	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	7.8	7.8		7.8	7.8			2.0			2.0	
Effective Green, g (s)	7.8	7.8		7.8	7.8			2.0			2.0	
Actuated g/C Ratio	0.44	0.44		0.44	0.44			0.11			0.11	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	436	1542		467	1543			200			200	
v/s Ratio Prot		0.08			c0.10							
v/s Ratio Perm	0.01			0.01				c0.01			0.01	
v/c Ratio	0.03	0.19		0.03	0.23			0.13			0.13	
Uniform Delay, d1	2.8	3.1		2.8	3.1			7.1			7.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.0	0.1		0.0	0.1			0.3			0.3	
Delay (s)	2.9	3.1		2.9	3.2			7.4			7.4	
Level of Service	A	A		A	A			A			A	
Approach Delay (s)		3.1			3.2			7.4			7.4	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM Average Control Delay	3.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.21		
Actuated Cycle Length (s)	17.8	Sum of lost time (s)	8.0
Intersection Capacity Utilization	18.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	190	20	40	210	160	60	340	45	80	170	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.2		4.0	4.2		4.0	4.2		4.0	4.2	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.94		1.00	0.98		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3489		1770	3328		1770	1830		1770	1799	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3489		1770	3328		1770	1830		1770	1799	
Peak-hour factor, PHF	0.86	0.86	0.86	0.78	0.78	0.78	0.87	0.87	0.87	0.94	0.94	0.94
Adj. Flow (vph)	58	221	23	51	269	205	69	391	52	85	181	53
RTOR Reduction (vph)	0	7	0	0	124	0	0	5	0	0	10	0
Lane Group Flow (vph)	58	237	0	51	350	0	69	438	0	85	224	0
Heavy Vehicles (%)	2%	2%	2%	2%	1%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	5.8	25.4		4.3	23.9		6.2	25.8		6.8	26.4	
Effective Green, g (s)	5.8	25.4		4.3	23.9		6.2	25.8		6.8	26.4	
Actuated g/C Ratio	0.07	0.32		0.05	0.30		0.08	0.33		0.09	0.34	
Clearance Time (s)	4.0	4.2		4.0	4.2		4.0	4.2		4.0	4.2	
Vehicle Extension (s)	2.0	5.0		2.0	5.0		2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	130	1126		97	1011		139	600		153	603	
v/s Ratio Prot	c0.03	0.07		0.03	c0.11		0.04	c0.24		c0.05	0.12	
v/s Ratio Perm												
v/c Ratio	0.45	0.21		0.53	0.35		0.50	0.73		0.56	0.37	
Uniform Delay, d1	34.9	19.4		36.2	21.3		34.8	23.4		34.5	19.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	0.2		2.4	0.4		1.0	5.5		2.5	0.8	
Delay (s)	35.8	19.6		38.6	21.8		35.8	28.9		37.0	20.7	
Level of Service	D	B		D	C		D	C		D	C	
Approach Delay (s)		22.7			23.4			29.8			25.0	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	25.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	78.7	Sum of lost time (s)	16.4
Intersection Capacity Utilization	53.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	10	0	115	0	75	5	65	160	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.2		4.2	4.2	4.0	4.2	
Lane Util. Factor					1.00	1.00		1.00	1.00	1.00	1.00	
Frt					1.00	0.85		1.00	0.85	1.00	1.00	
Flt Protected					0.95	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)					1770	1583		1863	1583	1770	1863	
Flt Permitted					0.95	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)					1770	1583		1863	1583	1770	1863	
Peak-hour factor, PHF	0.85	0.85	0.85	0.57	0.85	0.57	0.85	0.83	0.83	0.88	0.88	0.85
Adj. Flow (vph)	0	0	0	18	0	202	0	90	6	74	182	0
RTOR Reduction (vph)	0	0	0	0	0	153	0	0	4	0	0	0
Lane Group Flow (vph)	0	0	0	0	18	49	0	90	2	74	182	0
Turn Type				Perm		custom	Perm		Perm	Prot		
Protected Phases					8			6		5	2	
Permitted Phases				8		4	6		6			
Actuated Green, G (s)					10.0	9.8		15.6	15.6	2.8	22.4	
Effective Green, g (s)					10.0	9.8		15.6	15.6	2.8	22.4	
Actuated g/C Ratio					0.25	0.24		0.38	0.38	0.07	0.55	
Clearance Time (s)					4.0	4.2		4.2	4.2	4.0	4.2	
Vehicle Extension (s)					3.0	2.0		4.8	4.8	3.0	4.8	
Lane Grp Cap (vph)					436	382		716	608	122	1028	
v/s Ratio Prot								0.05		c0.04	c0.10	
v/s Ratio Perm					0.01	c0.03			0.00			
v/c Ratio					0.04	0.13		0.13	0.00	0.61	0.18	
Uniform Delay, d1					11.6	12.1		8.1	7.7	18.4	4.5	
Progression Factor					1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2					0.0	0.1		0.2	0.0	8.3	0.2	
Delay (s)					11.7	12.1		8.2	7.7	26.6	4.7	
Level of Service					B	B		A	A	C	A	
Approach Delay (s)		0.0			12.1			8.2			11.0	
Approach LOS		A			B			A			B	

Intersection Summary			
HCM Average Control Delay	11.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.19		
Actuated Cycle Length (s)	40.6	Sum of lost time (s)	8.2
Intersection Capacity Utilization	21.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	65	5	10	115	10	10	10	20	10	10	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.2	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.91			0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.98	
Satd. Flow (prot)	1770	1797		1805	1879		1805	1709			1750	
Flt Permitted	0.64	1.00		0.71	1.00		0.73	1.00			0.94	
Satd. Flow (perm)	1193	1797		1344	1879		1394	1709			1678	
Peak-hour factor, PHF	0.85	0.92	0.92	0.66	0.66	0.85	1.00	0.85	1.00	0.85	0.85	0.85
Adj. Flow (vph)	12	71	5	15	174	12	10	12	20	12	12	12
RTOR Reduction (vph)	0	3	0	0	4	0	0	13	0	0	8	0
Lane Group Flow (vph)	12	74	0	15	182	0	10	19	0	0	28	0
Heavy Vehicles (%)	2%	5%	0%	0%	0%	2%	0%	2%	0%	2%	2%	2%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		8			4			2			6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	30.0	30.0		30.0	30.0		22.0	22.0			21.8	
Effective Green, g (s)	30.0	30.0		30.0	30.0		22.0	22.0			21.8	
Actuated g/C Ratio	0.50	0.50		0.50	0.50		0.37	0.37			0.36	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.2	
Lane Grp Cap (vph)	597	899		672	940		511	627			610	
v/s Ratio Prot		0.04			c0.10			0.01				
v/s Ratio Perm	0.01			0.01			0.01				c0.02	
v/c Ratio	0.02	0.08		0.02	0.19		0.02	0.03			0.05	
Uniform Delay, d1	7.6	7.8		7.6	8.3		12.1	12.2			12.4	
Progression Factor	1.00	1.00		0.90	0.92		1.00	1.00			1.00	
Incremental Delay, d2	0.1	0.2		0.1	0.5		0.1	0.1			0.1	
Delay (s)	7.6	8.0		6.9	8.1		12.2	12.3			12.5	
Level of Service	A	A		A	A		B	B			B	
Approach Delay (s)		7.9			8.0			12.2			12.5	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM Average Control Delay	8.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.13		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.2
Intersection Capacity Utilization	47.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	40	35	20	60	40	50	290	25	10	190	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2		4.2	4.2		4.2	4.2		4.2	4.2	4.2
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.93		1.00	0.94		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1732		1770	1751		1770	1841		1770	1863	1583
Flt Permitted	0.67	1.00		0.70	1.00		0.63	1.00		0.48	1.00	1.00
Satd. Flow (perm)	1247	1732		1301	1751		1168	1841		894	1863	1583
Peak-hour factor, PHF	0.84	0.84	0.84	0.73	0.73	0.73	0.88	0.88	0.88	0.91	0.91	0.91
Adj. Flow (vph)	60	48	42	27	82	55	57	330	28	11	209	44
RTOR Reduction (vph)	0	26	0	0	34	0	0	5	0	0	0	23
Lane Group Flow (vph)	60	64	0	27	103	0	57	353	0	11	209	21
Turn Type	Perm			Perm			Perm			Perm		Perm
Protected Phases		8			4			6			2	
Permitted Phases	8			4			6			2		2
Actuated Green, G (s)	22.8	22.8		22.8	22.8		28.8	28.8		28.8	28.8	28.8
Effective Green, g (s)	22.8	22.8		22.8	22.8		28.8	28.8		28.8	28.8	28.8
Actuated g/C Ratio	0.38	0.38		0.38	0.38		0.48	0.48		0.48	0.48	0.48
Clearance Time (s)	4.2	4.2		4.2	4.2		4.2	4.2		4.2	4.2	4.2
Lane Grp Cap (vph)	474	658		494	665		561	884		429	894	760
v/s Ratio Prot		0.04			c0.06			c0.19			0.11	
v/s Ratio Perm	0.05			0.02			0.05			0.01		0.01
v/c Ratio	0.13	0.10		0.05	0.15		0.10	0.40		0.03	0.23	0.03
Uniform Delay, d1	12.1	12.0		11.8	12.3		8.5	10.0		8.2	9.1	8.2
Progression Factor	0.84	0.75		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.5	0.3		0.2	0.5		0.4	1.3		0.1	0.6	0.1
Delay (s)	10.7	9.3		12.0	12.7		8.9	11.4		8.3	9.8	8.3
Level of Service	B	A		B	B		A	B		A	A	A
Approach Delay (s)		9.8			12.6			11.0			9.4	
Approach LOS		A			B			B			A	

Intersection Summary			
HCM Average Control Delay	10.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.29		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.4
Intersection Capacity Utilization	72.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	45	540	15	5	750	40	15	10	10	70	10	70
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.77	0.77	0.77	0.73	0.73	0.73	0.82	0.82	0.82
Hourly flow rate (vph)	49	593	16	6	974	52	21	14	14	85	12	85
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			None							
Median storage veh)		2										
Upstream signal (ft)					400							
pX, platoon unblocked	0.84						0.84	0.84		0.84	0.84	0.84
vC, conflicting volume	1026			610			1292	1740	305	1429	1722	513
vC1, stage 1 conf vol							701	701		1013	1013	
vC2, stage 2 conf vol							591	1039		416	709	
vCu, unblocked vol	642			610			960	1495	305	1124	1473	30
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			99			94	95	98	72	96	90
cM capacity (veh/h)	786			965			329	268	691	310	291	869

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	49	396	214	6	649	377	48	183
Volume Left	49	0	0	6	0	0	21	85
Volume Right	0	0	16	0	0	52	14	85
cSH	786	1700	1700	965	1700	1700	360	440
Volume to Capacity	0.06	0.23	0.13	0.01	0.38	0.22	0.13	0.42
Queue Length 95th (ft)	5	0	0	1	0	0	11	50
Control Delay (s)	9.9	0.0	0.0	8.8	0.0	0.0	16.5	18.9
Lane LOS	A			A			C	C
Approach Delay (s)	0.7			0.1			16.5	18.9
Approach LOS							C	C

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	46.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	430	140	60	720	20	70	20	10	30	90	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.2		4.0	4.2		5.6	5.6		5.6	5.6	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	1.00		1.00	0.95		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3409		1770	3525		1770	1770		1770	1823	
Flt Permitted	0.95	1.00		0.95	1.00		0.63	1.00		0.73	1.00	
Satd. Flow (perm)	1770	3409		1770	3525		1166	1770		1367	1823	
Peak-hour factor, PHF	0.91	0.91	0.91	0.94	0.94	0.94	0.84	0.84	0.84	0.62	0.62	0.62
Adj. Flow (vph)	22	473	154	64	766	21	83	24	12	48	145	24
RTOR Reduction (vph)	0	35	0	0	2	0	0	8	0	0	6	0
Lane Group Flow (vph)	22	592	0	64	785	0	83	28	0	48	163	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	12.0	32.8		17.0	37.8		26.4	26.4		26.4	26.4	
Effective Green, g (s)	12.0	32.8		17.0	37.8		26.4	26.4		26.4	26.4	
Actuated g/C Ratio	0.13	0.36		0.19	0.42		0.29	0.29		0.29	0.29	
Clearance Time (s)	4.0	4.2		4.0	4.2		5.6	5.6		5.6	5.6	
Lane Grp Cap (vph)	236	1242		334	1481		342	519		401	535	
v/s Ratio Prot	0.01	c0.17		0.04	c0.22			0.02			c0.09	
v/s Ratio Perm							0.07			0.04		
v/c Ratio	0.09	0.48		0.19	0.53		0.24	0.05		0.12	0.30	
Uniform Delay, d1	34.2	22.0		30.7	19.5		24.2	22.8		23.3	24.7	
Progression Factor	1.00	1.00		1.14	1.25		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.8	1.3		1.2	1.2		1.7	0.2		0.6	1.5	
Delay (s)	35.0	23.3		36.3	25.6		25.9	23.0		23.9	26.1	
Level of Service	D	C		D	C		C	C		C	C	
Approach Delay (s)		23.7			26.4			25.0			25.6	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	25.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	49.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	370	40	35	540	80	200	260	60	75	120	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.2		4.0	4.2		4.2	4.2	4.2	4.2	4.2	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	0.98		1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3487		1770	3471		1770	1863	1583	1770	1769	
Flt Permitted	0.95	1.00		0.95	1.00		0.52	1.00	1.00	0.39	1.00	
Satd. Flow (perm)	1770	3487		1770	3471		977	1863	1583	733	1769	
Peak-hour factor, PHF	0.91	0.91	0.91	0.80	0.80	0.80	0.87	0.87	0.87	0.85	0.85	0.85
Adj. Flow (vph)	38	407	44	44	675	100	230	299	69	88	141	71
RTOR Reduction (vph)	0	6	0	0	9	0	0	0	35	0	25	0
Lane Group Flow (vph)	38	445	0	44	766	0	230	299	34	88	187	0
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	6.0	46.4		4.7	45.1		26.5	26.5	26.5	26.5	26.5	
Effective Green, g (s)	6.0	46.4		4.7	45.1		26.5	26.5	26.5	26.5	26.5	
Actuated g/C Ratio	0.07	0.52		0.05	0.50		0.29	0.29	0.29	0.29	0.29	
Clearance Time (s)	4.0	4.2		4.0	4.2		4.2	4.2	4.2	4.2	4.2	
Vehicle Extension (s)	2.0	4.8		2.0	4.8		4.8	4.8	4.8	4.8	4.8	
Lane Grp Cap (vph)	118	1798		92	1739		288	549	466	216	521	
v/s Ratio Prot	0.02	c0.13		0.02	c0.22			0.16			0.11	
v/s Ratio Perm							c0.24		0.02	0.12		
v/c Ratio	0.32	0.25		0.48	0.44		0.80	0.54	0.07	0.41	0.36	
Uniform Delay, d1	40.1	12.1		41.5	14.4		29.3	26.7	22.9	25.5	25.0	
Progression Factor	0.57	0.62		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.5	0.3		1.4	0.8		16.0	1.8	0.1	2.4	0.8	
Delay (s)	23.2	7.8		42.9	15.2		45.3	28.5	23.0	27.9	25.9	
Level of Service	C	A		D	B		D	C	C	C	C	
Approach Delay (s)		9.0			16.7			34.3			26.5	
Approach LOS		A			B			C			C	

Intersection Summary			
HCM Average Control Delay	21.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.4
Intersection Capacity Utilization	57.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

APPENDIX E:
TECHNICAL CALCULATIONS – CUMULATIVE CONDITIONS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	410	10	40	440	30	80	290	10	80	400	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.2		4.5	4.2		4.2	4.2			4.2	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frt	1.00	1.00		1.00	0.99		1.00	0.99			0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1770	1856		1770	1845		1770	1853			1833	
Flt Permitted	0.95	1.00		0.95	1.00		0.35	1.00			0.84	
Satd. Flow (perm)	1770	1856		1770	1845		652	1853			1560	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.93	0.93	0.93	0.92	0.92	0.92
Adj. Flow (vph)	98	446	11	43	478	33	86	312	11	87	435	33
RTOR Reduction (vph)	0	1	0	0	3	0	0	1	0	0	2	0
Lane Group Flow (vph)	98	456	0	43	508	0	86	322	0	0	553	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			6			2	
Permitted Phases							6			2		
Actuated Green, G (s)	7.2	35.4		3.7	31.9		38.0	38.0			38.0	
Effective Green, g (s)	7.2	35.4		3.7	31.9		38.0	38.0			38.0	
Actuated g/C Ratio	0.08	0.39		0.04	0.35		0.42	0.42			0.42	
Clearance Time (s)	4.5	4.2		4.5	4.2		4.2	4.2			4.2	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	142	730		73	654		275	782			659	
v/s Ratio Prot	0.06	c0.25		0.02	c0.28			0.17				
v/s Ratio Perm							0.13				c0.35	
v/c Ratio	0.69	0.62		0.59	0.78		0.31	0.41			0.84	
Uniform Delay, d1	40.3	22.0		42.4	25.9		17.3	18.2			23.3	
Progression Factor	0.65	0.48		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	12.6	3.7		11.6	8.8		3.0	1.6			12.2	
Delay (s)	38.7	14.3		54.0	34.7		20.3	19.8			35.4	
Level of Service	D	B		D	C		C	B			D	
Approach Delay (s)		18.6			36.2			19.9			35.4	
Approach LOS		B			D			B			D	

Intersection Summary			
HCM Average Control Delay	28.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.4
Intersection Capacity Utilization	87.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	410	60	90	370	10	10	20	20	10	350	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		5.2	5.2		5.2	5.2		5.2	5.2	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	1.00		1.00	0.93		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1827		1770	1817		1770	1723		1770	1778	
Flt Permitted	0.48	1.00		0.37	1.00		0.20	1.00		0.73	1.00	
Satd. Flow (perm)	885	1827		681	1817		370	1723		1357	1778	
Peak-hour factor, PHF	0.92	0.92	0.92	1.00	1.00	1.00	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	446	65	90	370	10	11	22	22	11	380	120
RTOR Reduction (vph)	0	5	0	0	1	0	0	15	0	0	15	0
Lane Group Flow (vph)	11	506	0	90	379	0	11	29	0	11	485	0
Heavy Vehicles (%)	2%	2%	2%	2%	4%	10%	2%	2%	2%	2%	3%	3%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			2	
Permitted Phases	4			8			2			2		
Actuated Green, G (s)	50.0	50.0		49.3	49.3		30.3	30.3		30.3	30.3	
Effective Green, g (s)	50.0	50.0		49.3	49.3		30.3	30.3		30.3	30.3	
Actuated g/C Ratio	0.56	0.56		0.55	0.55		0.34	0.34		0.34	0.34	
Clearance Time (s)	4.5	4.5		5.2	5.2		5.2	5.2		5.2	5.2	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	492	1015		373	995		125	580		457	599	
v/s Ratio Prot		c0.28			0.21			0.02			c0.27	
v/s Ratio Perm	0.01			0.13			0.03			0.01		
v/c Ratio	0.02	0.50		0.24	0.38		0.09	0.05		0.02	0.81	
Uniform Delay, d1	9.0	12.3		10.6	11.6		20.4	20.1		20.0	27.2	
Progression Factor	0.89	0.65		0.71	0.66		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	1.2		1.1	0.8		0.3	0.0		0.0	8.2	
Delay (s)	8.0	9.2		8.6	8.5		20.7	20.2		20.0	35.4	
Level of Service	A	A		A	A		C	C		B	D	
Approach Delay (s)		9.2			8.5			20.3			35.1	
Approach LOS		A			A			C			D	

Intersection Summary			
HCM Average Control Delay	17.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.7
Intersection Capacity Utilization	67.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	310	360	210	340	280	10	50	100	180	40	210	250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.2	4.2	4.2	4.2	4.2	4.2	4.2		4.5	4.2	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.90		1.00	0.92	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1683		1770	1711	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583	1770	1683		1770	1711	
Peak-hour factor, PHF	0.92	0.92	0.92	0.96	0.96	0.96	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	337	391	228	354	292	10	54	109	196	43	228	272
RTOR Reduction (vph)	0	0	175	0	0	5	0	67	0	0	48	0
Lane Group Flow (vph)	337	391	53	354	292	5	54	238	0	43	452	0
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		2	5		6	1	
Permitted Phases			4			8						
Actuated Green, G (s)	18.9	20.8	20.8	19.8	21.4	21.4	7.8	28.1		4.2	24.8	
Effective Green, g (s)	18.9	20.8	20.8	19.8	21.4	21.4	7.8	28.1		4.2	24.8	
Actuated g/C Ratio	0.21	0.23	0.23	0.22	0.24	0.24	0.09	0.31		0.05	0.28	
Clearance Time (s)	4.5	4.2	4.2	4.2	4.2	4.2	4.2	4.2		4.5	4.2	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	372	431	366	389	443	376	153	525		83	471	
v/s Ratio Prot	0.19	c0.21		c0.20	0.16		0.03	c0.14		0.02	c0.26	
v/s Ratio Perm			0.03			0.00						
v/c Ratio	0.91	0.91	0.14	0.91	0.66	0.01	0.35	0.45		0.52	0.96	
Uniform Delay, d1	34.7	33.7	27.5	34.2	31.0	26.2	38.7	24.8		41.9	32.1	
Progression Factor	1.00	1.00	1.00	0.90	0.89	0.79	1.00	1.00		1.00	1.00	
Incremental Delay, d2	24.7	25.4	0.8	26.9	7.2	0.1	6.3	2.8		5.4	32.6	
Delay (s)	59.4	59.1	28.3	57.9	34.9	20.9	45.0	27.6		47.3	64.7	
Level of Service	E	E	C	E	C	C	D	C		D	E	
Approach Delay (s)		51.8			47.1			30.2			63.4	
Approach LOS		D			D			C			E	

Intersection Summary			
HCM Average Control Delay	50.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.6
Intersection Capacity Utilization	83.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	70	70	170	70	200	30	120	60	110	560	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2	4.2	4.2	4.2			4.2	4.2	4.6	4.6	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.89			1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.99	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1656			1844	1583	1770	1858	
Flt Permitted	0.36	1.00	1.00	0.71	1.00			0.80	1.00	0.12	1.00	
Satd. Flow (perm)	665	1863	1583	1322	1656			1487	1583	217	1858	
Peak-hour factor, PHF	0.96	0.96	0.96	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	31	73	73	185	76	217	33	130	65	120	609	11
RTOR Reduction (vph)	0	0	55	0	128	0	0	0	54	0	1	0
Lane Group Flow (vph)	31	73	18	185	165	0	0	163	11	120	619	0
Turn Type	Perm		Perm	Perm			Perm		Perm	Perm		
Protected Phases		4			8			1			2	
Permitted Phases	4		4	8			1		1	2		
Actuated Green, G (s)	19.6	19.6	19.6	19.6	19.6			13.0	13.0	34.4	34.4	
Effective Green, g (s)	19.6	19.6	19.6	19.6	19.6			13.0	13.0	34.4	34.4	
Actuated g/C Ratio	0.25	0.25	0.25	0.25	0.25			0.16	0.16	0.43	0.43	
Clearance Time (s)	4.2	4.2	4.2	4.2	4.2			4.2	4.2	4.6	4.6	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0			2.0	2.0	3.8	3.8	
Lane Grp Cap (vph)	163	456	388	324	406			242	257	93	799	
v/s Ratio Prot		0.04			0.10						0.33	
v/s Ratio Perm	0.05		0.01	c0.14				c0.11	0.01	c0.55		
v/c Ratio	0.19	0.16	0.05	0.57	0.41			0.67	0.04	1.29	0.78	
Uniform Delay, d1	23.9	23.7	23.1	26.5	25.3			31.5	28.2	22.8	19.5	
Progression Factor	1.00	1.00	1.00	1.18	1.45			1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.6	0.8	0.2	7.0	2.9			14.0	0.3	189.8	7.3	
Delay (s)	26.5	24.5	23.3	38.3	39.8			45.5	28.5	212.6	26.7	
Level of Service	C	C	C	D	D			D	C	F	C	
Approach Delay (s)		24.3			39.2			40.7			56.9	
Approach LOS		C			D			D			E	

Intersection Summary			
HCM Average Control Delay	45.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	72.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	40	110	190	20	340	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.2	4.2		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1845	1839		1719	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	1845	1839		1719	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	1.00	1.00
Adj. Flow (vph)	43	120	207	22	340	200
RTOR Reduction (vph)	0	0	4	0	0	134
Lane Group Flow (vph)	43	120	225	0	340	66
Heavy Vehicles (%)	2%	3%	2%	2%	5%	2%
Turn Type	Prot					custom
Protected Phases	7	4	8			
Permitted Phases					2	2
Actuated Green, G (s)	4.4	45.4	36.5		26.4	26.4
Effective Green, g (s)	4.4	45.4	36.5		26.4	26.4
Actuated g/C Ratio	0.06	0.57	0.46		0.33	0.33
Clearance Time (s)	4.5	4.2	4.2		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	97	1047	839		567	522
v/s Ratio Prot	c0.02	0.07	c0.12			
v/s Ratio Perm					c0.20	0.04
v/c Ratio	0.44	0.11	0.27		0.60	0.13
Uniform Delay, d1	36.6	8.0	13.5		22.4	18.7
Progression Factor	1.03	0.82	2.00		1.00	1.00
Incremental Delay, d2	2.3	0.2	0.3		1.7	0.1
Delay (s)	39.9	6.7	27.3		24.1	18.8
Level of Service	D	A	C		C	B
Approach Delay (s)		15.4	27.3		22.2	
Approach LOS		B	C		C	

Intersection Summary			
HCM Average Control Delay	22.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.7
Intersection Capacity Utilization	45.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	210	120	0	0	0	200	340	50	60	260	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2					4.5	4.2		4.5	4.2	
Lane Util. Factor	1.00	1.00					1.00	1.00		1.00	1.00	
Frt	1.00	0.95					1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00					0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1761					1770	1827		1770	1818	
Flt Permitted	0.95	1.00					0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1761					1770	1827		1770	1818	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	228	130	0	0	0	217	370	54	65	283	54
RTOR Reduction (vph)	0	26	0	0	0	0	0	6	0	0	9	0
Lane Group Flow (vph)	11	332	0	0	0	0	217	418	0	65	328	0
Turn Type	Perm						Prot			Prot		
Protected Phases		8					1	6		5	2	
Permitted Phases	8											
Actuated Green, G (s)	30.1	30.1					9.5	29.9		7.1	27.5	
Effective Green, g (s)	30.1	30.1					9.5	29.9		7.1	27.5	
Actuated g/C Ratio	0.38	0.38					0.12	0.37		0.09	0.34	
Clearance Time (s)	4.2	4.2					4.5	4.2		4.5	4.2	
Vehicle Extension (s)	3.0	3.0					3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	666	663					210	683		157	625	
v/s Ratio Prot		c0.19					c0.12	c0.23		0.04	0.18	
v/s Ratio Perm	0.01											
v/c Ratio	0.02	0.50					1.03	0.61		0.41	0.53	
Uniform Delay, d1	15.7	19.2					35.2	20.3		34.5	21.0	
Progression Factor	1.37	1.53					1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	2.5					71.1	1.6		1.8	0.8	
Delay (s)	21.6	31.9					106.3	22.0		36.3	21.8	
Level of Service	C	C					F	C		D	C	
Approach Delay (s)		31.6			0.0			50.5			24.2	
Approach LOS		C			A			D			C	

Intersection Summary			
HCM Average Control Delay	38.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.7
Intersection Capacity Utilization	56.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	310	990	290	200	460	10	120	260	70	20	270	230
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	1.00		1.00	0.97		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3419		1770	3528		1770	1804		1770	1734	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3419		1770	3528		1770	1804		1770	1734	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	337	1076	315	217	500	11	130	283	76	22	293	250
RTOR Reduction (vph)	0	32	0	0	2	0	0	9	0	0	33	0
Lane Group Flow (vph)	337	1359	0	217	509	0	130	350	0	22	510	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	18.9	30.8		9.5	21.4		6.5	29.1		2.6	25.2	
Effective Green, g (s)	18.9	30.8		9.5	21.4		6.5	29.1		2.6	25.2	
Actuated g/C Ratio	0.21	0.34		0.11	0.24		0.07	0.32		0.03	0.28	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	372	1170		187	839		128	583		51	486	
v/s Ratio Prot	0.19	c0.40		c0.12	0.14		c0.07	c0.19		0.01	c0.29	
v/s Ratio Perm												
v/c Ratio	0.91	1.16		1.16	0.61		1.02	0.60		0.43	1.05	
Uniform Delay, d1	34.7	29.6		40.2	30.6		41.8	25.6		43.0	32.4	
Progression Factor	1.00	1.00		1.12	0.89		1.04	0.78		1.00	1.00	
Incremental Delay, d2	24.7	82.6		100.6	1.9		79.6	1.5		5.8	54.3	
Delay (s)	59.4	112.2		145.6	28.9		123.2	21.4		48.7	86.7	
Level of Service	E	F		F	C		F	C		D	F	
Approach Delay (s)		101.9			63.7			48.4			85.2	
Approach LOS		F			E			D			F	

Intersection Summary			
HCM Average Control Delay	83.8	HCM Level of Service	F
HCM Volume to Capacity ratio	1.17		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	22.5
Intersection Capacity Utilization	97.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	130	730	100	120	530	250	100	410	200	160	270	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2		4.2	4.2		4.2	4.2		4.2	4.2	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.95		1.00	0.95		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3475		1770	3392		1770	1771		1770	1812	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3475		1770	3392		1770	1771		1770	1812	
Peak-hour factor, PHF	0.96	0.96	0.96	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	135	760	104	130	576	272	109	446	217	174	293	65
RTOR Reduction (vph)	0	12	0	0	62	0	0	19	0	0	9	0
Lane Group Flow (vph)	135	852	0	130	786	0	109	644	0	174	349	0
Heavy Vehicles (%)	2%	2%	2%	2%	1%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	6.8	24.0		6.8	24.0		7.4	33.6		8.8	35.0	
Effective Green, g (s)	6.8	24.0		6.8	24.0		7.4	33.6		8.8	35.0	
Actuated g/C Ratio	0.08	0.27		0.08	0.27		0.08	0.37		0.10	0.39	
Clearance Time (s)	4.2	4.2		4.2	4.2		4.2	4.2		4.2	4.2	
Vehicle Extension (s)	3.0	5.0		3.0	5.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	134	927		134	905		146	661		173	705	
v/s Ratio Prot	c0.08	c0.25		0.07	0.23		0.06	c0.36		c0.10	0.19	
v/s Ratio Perm												
v/c Ratio	1.01	0.92		0.97	0.87		0.75	0.97		1.01	0.50	
Uniform Delay, d1	41.6	32.1		41.5	31.5		40.4	27.8		40.6	20.8	
Progression Factor	0.78	1.47		1.00	1.00		1.21	0.69		1.00	1.00	
Incremental Delay, d2	25.2	1.7		68.3	9.6		10.9	20.4		69.9	2.5	
Delay (s)	57.7	48.8		109.8	41.1		59.8	39.5		110.5	23.3	
Level of Service	E	D		F	D		E	D		F	C	
Approach Delay (s)		50.0			50.2			42.3			51.8	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM Average Control Delay	48.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.8
Intersection Capacity Utilization	86.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	460	120	50	370	270	70	360	60	120	280	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2		4.2	4.2		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.94		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3430		1770	3315		1770	1823		1770	1863	1583
Flt Permitted	0.28	1.00		0.31	1.00		0.52	1.00		0.39	1.00	1.00
Satd. Flow (perm)	517	3430		586	3315		971	1823		726	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	500	130	54	402	293	76	391	65	130	304	98
RTOR Reduction (vph)	0	26	0	0	147	0	0	7	0	0	0	47
Lane Group Flow (vph)	43	604	0	54	548	0	76	449	0	130	304	51
Turn Type	Perm			Perm			Perm			Perm		Perm
Protected Phases		8			4			6			2	
Permitted Phases	8			4			6			2		2
Actuated Green, G (s)	34.8	34.8		34.8	34.8		46.5	46.5		46.5	46.5	46.5
Effective Green, g (s)	34.8	34.8		34.8	34.8		46.5	46.5		46.5	46.5	46.5
Actuated g/C Ratio	0.39	0.39		0.39	0.39		0.52	0.52		0.52	0.52	0.52
Clearance Time (s)	4.2	4.2		4.2	4.2		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	200	1326		227	1282		502	942		375	963	818
v/s Ratio Prot		c0.18			0.17			c0.25			0.16	
v/s Ratio Perm	0.08			0.09			0.08			0.18		0.03
v/c Ratio	0.21	0.46		0.24	0.43		0.15	0.48		0.35	0.32	0.06
Uniform Delay, d1	18.5	20.5		18.6	20.3		11.4	13.9		12.8	12.6	10.9
Progression Factor	1.00	1.00		0.30	0.14		1.00	1.00		1.36	1.34	2.19
Incremental Delay, d2	2.4	1.1		1.8	0.8		0.6	1.7		0.2	0.1	0.0
Delay (s)	20.9	21.7		7.4	3.6		12.0	15.7		17.6	17.0	23.8
Level of Service	C	C		A	A		B	B		B	B	C
Approach Delay (s)		21.6			3.9			15.2			18.4	
Approach LOS		C			A			B			B	

Intersection Summary			
HCM Average Control Delay	14.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.7
Intersection Capacity Utilization	94.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	80	540	30	60	650	180	100	420	70	150	350	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.2		4.0	4.2		4.0	4.2		4.0	4.2	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.97		1.00	0.98		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3511		1770	3450		1770	1823		1770	1816	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3511		1770	3450		1770	1823		1770	1816	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.96	0.96	0.96
Adj. Flow (vph)	87	587	33	65	707	196	109	457	76	156	365	73
RTOR Reduction (vph)	0	4	0	0	28	0	0	7	0	0	9	0
Lane Group Flow (vph)	87	616	0	65	875	0	109	526	0	156	429	0
Heavy Vehicles (%)	2%	2%	2%	2%	1%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	4.8	32.2		4.8	32.2		10.6	27.6		9.0	26.0	
Effective Green, g (s)	4.8	32.2		4.8	32.2		10.6	27.6		9.0	26.0	
Actuated g/C Ratio	0.05	0.36		0.05	0.36		0.12	0.31		0.10	0.29	
Clearance Time (s)	4.0	4.2		4.0	4.2		4.0	4.2		4.0	4.2	
Vehicle Extension (s)	2.0	5.0		2.0	5.0		2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	94	1256		94	1234		208	559		177	525	
v/s Ratio Prot	c0.05	0.18		0.04	c0.25		0.06	c0.29		0.09	c0.24	
v/s Ratio Perm												
v/c Ratio	0.93	0.49		0.69	0.71		0.52	0.94		0.88	0.82	
Uniform Delay, d1	42.4	22.5		41.9	24.9		37.3	30.4		40.0	29.8	
Progression Factor	0.84	0.91		1.00	1.00		1.00	1.00		0.83	0.91	
Incremental Delay, d2	64.0	1.3		16.2	3.5		1.1	24.9		29.9	8.7	
Delay (s)	99.5	21.7		58.1	28.3		38.4	55.3		63.2	35.8	
Level of Service	F	C		E	C		D	E		E	D	
Approach Delay (s)		31.2			30.3			52.5			43.0	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM Average Control Delay	38.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.6
Intersection Capacity Utilization	76.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	20	0	380	0	320	100	100	220	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.5	4.5		4.2	4.2	4.0	4.2	
Lane Util. Factor					1.00	1.00		1.00	1.00	1.00	1.00	
Frt					1.00	0.85		1.00	0.85	1.00	1.00	
Flt Protected					0.95	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)					1770	1583		1863	1583	1770	1863	
Flt Permitted					0.95	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)					1770	1583		1863	1583	1770	1863	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	22	0	413	0	348	109	109	239	0
RTOR Reduction (vph)	0	0	0	0	0	328	0	0	57	0	0	0
Lane Group Flow (vph)	0	0	0	0	22	85	0	348	52	109	239	0
Turn Type				Split		Perm	Perm		Perm	Prot		
Protected Phases				4	4			6		5	2	
Permitted Phases						4	6		6			
Actuated Green, G (s)					9.3	9.3		16.4	16.4	7.0	27.4	
Effective Green, g (s)					9.3	9.3		16.4	16.4	7.0	27.4	
Actuated g/C Ratio					0.20	0.20		0.36	0.36	0.15	0.60	
Clearance Time (s)					4.5	4.5		4.2	4.2	4.0	4.2	
Vehicle Extension (s)					3.0	3.0		4.8	4.8	3.0	4.8	
Lane Grp Cap (vph)					363	324		673	572	273	1124	
v/s Ratio Prot					0.01			c0.19		c0.06	0.13	
v/s Ratio Perm						c0.05			0.03			
v/c Ratio					0.06	0.26		0.52	0.09	0.40	0.21	
Uniform Delay, d1					14.5	15.2		11.4	9.6	17.3	4.1	
Progression Factor					1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2					0.1	0.4		1.2	0.1	1.0	0.2	
Delay (s)					14.6	15.6		12.6	9.7	18.3	4.3	
Level of Service					B	B		B	A	B	A	
Approach Delay (s)		0.0			15.5			11.9			8.7	
Approach LOS		A			B			B			A	

Intersection Summary			
HCM Average Control Delay	12.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	45.4	Sum of lost time (s)	12.7
Intersection Capacity Utilization	47.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	190	10	10	70	10	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.2	4.2
Lane Util. Factor	1.00		1.00	1.00	1.00	1.00
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	1833		1770	1863	1641	1583
Flt Permitted	1.00		0.62	1.00	0.95	1.00
Satd. Flow (perm)	1833		1153	1863	1641	1583
Peak-hour factor, PHF	0.92	0.92	1.00	1.00	1.00	1.00
Adj. Flow (vph)	207	11	10	70	10	20
RTOR Reduction (vph)	3	0	0	0	0	13
Lane Group Flow (vph)	215	0	10	70	10	7
Heavy Vehicles (%)	3%	2%	2%	2%	10%	2%
Turn Type			Perm			custom
Protected Phases	8			4		
Permitted Phases			4		6	6
Actuated Green, G (s)	30.0		30.0	30.0	21.8	21.8
Effective Green, g (s)	30.0		30.0	30.0	21.8	21.8
Actuated g/C Ratio	0.50		0.50	0.50	0.36	0.36
Clearance Time (s)	4.0		4.0	4.0	4.2	4.2
Lane Grp Cap (vph)	917		577	932	596	575
v/s Ratio Prot	c0.12			0.04		
v/s Ratio Perm			0.01		c0.01	0.00
v/c Ratio	0.23		0.02	0.08	0.02	0.01
Uniform Delay, d1	8.5		7.6	7.8	12.2	12.2
Progression Factor	1.00		1.90	1.91	1.00	1.00
Incremental Delay, d2	0.6		0.1	0.2	0.1	0.0
Delay (s)	9.1		14.4	15.1	12.3	12.3
Level of Service	A		B	B	B	B
Approach Delay (s)	9.1			15.0	12.3	
Approach LOS	A			B	B	

Intersection Summary			
HCM Average Control Delay	10.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.14		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.2
Intersection Capacity Utilization	47.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	90	60	10	70	100	120	460	60	20	320	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2		4.2	4.2		4.2	4.2		4.2	4.2	4.2
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.94		1.00	0.91		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1751		1770	1698		1770	1831		1770	1863	1583
Flt Permitted	0.64	1.00		0.65	1.00		0.49	1.00		0.29	1.00	1.00
Satd. Flow (perm)	1191	1751		1218	1698		912	1831		548	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	65	98	65	11	76	109	130	500	65	22	348	22
RTOR Reduction (vph)	0	40	0	0	68	0	0	8	0	0	0	11
Lane Group Flow (vph)	65	123	0	11	117	0	130	557	0	22	348	11
Turn Type	Perm			Perm			Perm			Perm		Perm
Protected Phases		8			4			6			2	
Permitted Phases	8			4			6			2		2
Actuated Green, G (s)	22.8	22.8		22.8	22.8		28.8	28.8		28.8	28.8	28.8
Effective Green, g (s)	22.8	22.8		22.8	22.8		28.8	28.8		28.8	28.8	28.8
Actuated g/C Ratio	0.38	0.38		0.38	0.38		0.48	0.48		0.48	0.48	0.48
Clearance Time (s)	4.2	4.2		4.2	4.2		4.2	4.2		4.2	4.2	4.2
Lane Grp Cap (vph)	453	665		463	645		438	879		263	894	760
v/s Ratio Prot		c0.07			0.07			c0.30			0.19	
v/s Ratio Perm	0.05			0.01			0.14			0.04		0.01
v/c Ratio	0.14	0.19		0.02	0.18		0.30	0.63		0.08	0.39	0.01
Uniform Delay, d1	12.2	12.4		11.6	12.4		9.5	11.7		8.5	10.0	8.2
Progression Factor	0.93	0.89		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.7	0.6		0.1	0.6		1.7	3.5		0.6	1.3	0.0
Delay (s)	12.0	11.6		11.7	13.0		11.2	15.1		9.1	11.3	8.2
Level of Service	B	B		B	B		B	B		A	B	A
Approach Delay (s)		11.7			12.9			14.4			11.0	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM Average Control Delay	12.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.4
Intersection Capacity Utilization	100.2%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	360	1040	30	10	710	110	30	10	10	70	30	110
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	391	1130	33	11	772	120	33	11	11	76	33	120
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					400							
pX, platoon unblocked	0.93						0.93	0.93		0.93	0.93	0.93
vC, conflicting volume	891			1163			2473	2842	582	2217	2799	446
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	742			1163			2436	2831	582	2162	2785	265
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	51			98			0	0	98	0	0	83
cM capacity (veh/h)	804			596			0	8	457	0	9	685

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	391	754	409	11	514	377	54	228
Volume Left	391	0	0	11	0	0	33	76
Volume Right	0	0	33	0	0	120	11	120
cSH	804	1700	1700	596	1700	1700	0	0
Volume to Capacity	0.49	0.44	0.24	0.02	0.30	0.22	Err	Err
Queue Length 95th (ft)	68	0	0	1	0	0	Err	Err
Control Delay (s)	13.7	0.0	0.0	11.1	0.0	0.0	Err	Err
Lane LOS	B			B			F	F
Approach Delay (s)	3.4			0.1			Err	Err
Approach LOS							F	F

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	65.8%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	790	270	40	590	120	170	150	20	20	20	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.2		4.0	4.2		5.6	5.6		5.6	5.6	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.97		1.00	0.98		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3404		1770	3450		1770	1830		1770	1770	
Flt Permitted	0.95	1.00		0.95	1.00		0.74	1.00		0.54	1.00	
Satd. Flow (perm)	1770	3404		1770	3450		1370	1830		1000	1770	
Peak-hour factor, PHF	0.92	0.92	0.92	0.95	0.95	0.95	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	859	293	42	621	126	185	163	22	22	22	11
RTOR Reduction (vph)	0	29	0	0	13	0	0	6	0	0	9	0
Lane Group Flow (vph)	11	1123	0	42	734	0	185	179	0	22	24	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	1.6	54.2		5.0	57.6		17.0	17.0		17.0	17.0	
Effective Green, g (s)	1.6	54.2		5.0	57.6		17.0	17.0		17.0	17.0	
Actuated g/C Ratio	0.02	0.60		0.06	0.64		0.19	0.19		0.19	0.19	
Clearance Time (s)	4.0	4.2		4.0	4.2		5.6	5.6		5.6	5.6	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	31	2050		98	2208		259	346		189	334	
v/s Ratio Prot	0.01	c0.33		0.02	c0.21			0.10			0.01	
v/s Ratio Perm							c0.14			0.02		
v/c Ratio	0.35	0.55		0.43	0.33		0.71	0.52		0.12	0.07	
Uniform Delay, d1	43.7	10.6		41.1	7.4		34.2	32.8		30.3	30.0	
Progression Factor	1.00	1.00		0.79	0.86		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.5	1.1		0.9	0.3		7.5	0.5		0.1	0.0	
Delay (s)	46.2	11.7		33.4	6.7		41.8	33.4		30.4	30.0	
Level of Service	D	B		C	A		D	C		C	C	
Approach Delay (s)		12.0			8.2			37.6			30.2	
Approach LOS		B			A			D			C	

Intersection Summary			
HCM Average Control Delay	15.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	58.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	610	50	60	500	170	290	470	140	190	220	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.2		4.0	4.2		4.2	4.2	4.2	4.2	4.2	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	0.96		1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3499		1770	3404		1770	1863	1583	1770	1820	
Flt Permitted	0.95	1.00		0.95	1.00		0.50	1.00	1.00	0.26	1.00	
Satd. Flow (perm)	1770	3499		1770	3404		924	1863	1583	479	1820	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	65	663	54	65	543	185	315	511	152	207	239	43
RTOR Reduction (vph)	0	5	0	0	31	0	0	0	44	0	9	0
Lane Group Flow (vph)	65	712	0	65	697	0	315	511	108	207	273	0
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	4.8	36.0		4.8	36.0		36.8	36.8	36.8	36.8	36.8	
Effective Green, g (s)	4.8	36.0		4.8	36.0		36.8	36.8	36.8	36.8	36.8	
Actuated g/C Ratio	0.05	0.40		0.05	0.40		0.41	0.41	0.41	0.41	0.41	
Clearance Time (s)	4.0	4.2		4.0	4.2		4.2	4.2	4.2	4.2	4.2	
Vehicle Extension (s)	2.0	4.8		2.0	4.8		4.8	4.8	4.8	4.8	4.8	
Lane Grp Cap (vph)	94	1400		94	1362		378	762	647	196	744	
v/s Ratio Prot	c0.04	c0.20		0.04	c0.20			0.27			0.15	
v/s Ratio Perm							0.34		0.07	c0.43		
v/c Ratio	0.69	0.51		0.69	0.51		0.83	0.67	0.17	1.06	0.37	
Uniform Delay, d1	41.9	20.3		41.9	20.4		23.9	21.7	16.9	26.6	18.5	
Progression Factor	0.77	0.61		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	14.2	1.1		16.2	1.4		15.9	2.9	0.2	79.9	0.6	
Delay (s)	46.5	13.6		58.1	21.7		39.7	24.6	17.1	106.5	19.1	
Level of Service	D	B		E	C		D	C	B	F	B	
Approach Delay (s)		16.3			24.7			28.3			56.1	
Approach LOS		B			C			C			E	

Intersection Summary			
HCM Average Control Delay	28.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.2
Intersection Capacity Utilization	73.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	160	440	10	30	550	110	120	450	30	50	330	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.2		4.5	4.2		4.2	4.2			4.2	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frt	1.00	1.00		1.00	0.97		1.00	0.99			1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1770	1856		1770	1816		1770	1845			1844	
Flt Permitted	0.95	1.00		0.95	1.00		0.38	1.00			0.60	
Satd. Flow (perm)	1770	1856		1770	1816		714	1845			1118	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.93	0.93	0.93	0.92	0.92	0.92
Adj. Flow (vph)	174	478	11	33	598	120	129	484	32	54	359	11
RTOR Reduction (vph)	0	1	0	0	8	0	0	3	0	0	1	0
Lane Group Flow (vph)	174	488	0	33	710	0	129	513	0	0	423	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			6			2	
Permitted Phases							6			2		
Actuated Green, G (s)	11.5	40.3		3.6	32.4		33.2	33.2			33.2	
Effective Green, g (s)	11.5	40.3		3.6	32.4		33.2	33.2			33.2	
Actuated g/C Ratio	0.13	0.45		0.04	0.36		0.37	0.37			0.37	
Clearance Time (s)	4.5	4.2		4.5	4.2		4.2	4.2			4.2	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	226	831		71	654		263	681			412	
v/s Ratio Prot	c0.10	0.26		0.02	c0.39			0.28				
v/s Ratio Perm							0.18				c0.38	
v/c Ratio	0.77	0.59		0.46	1.09		0.49	0.75			1.03	
Uniform Delay, d1	38.0	18.6		42.3	28.8		21.9	24.8			28.4	
Progression Factor	0.91	0.82		1.00	1.00		0.77	0.71			1.00	
Incremental Delay, d2	14.0	2.9		4.7	60.5		3.9	4.7			51.2	
Delay (s)	48.6	18.2		47.0	89.3		20.7	22.3			79.6	
Level of Service	D	B		D	F		C	C			E	
Approach Delay (s)		26.2			87.5			22.0			79.6	
Approach LOS		C			F			C			E	

Intersection Summary			
HCM Average Control Delay	52.7	HCM Level of Service	D
HCM Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.9
Intersection Capacity Utilization	105.0%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	440	20	40	560	90	40	260	40	10	150	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		5.2	5.2		5.2	5.2		5.2	5.2	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.98		1.00	0.98		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1850		1770	1775		1770	1826		1770	1766	
Flt Permitted	0.33	1.00		0.42	1.00		0.48	1.00		0.30	1.00	
Satd. Flow (perm)	611	1850		781	1775		891	1826		557	1766	
Peak-hour factor, PHF	0.92	0.92	0.92	1.00	1.00	1.00	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	65	478	22	40	560	90	43	283	43	11	163	65
RTOR Reduction (vph)	0	1	0	0	5	0	0	7	0	0	18	0
Lane Group Flow (vph)	65	499	0	40	645	0	43	319	0	11	210	0
Heavy Vehicles (%)	2%	2%	2%	2%	4%	10%	2%	2%	2%	2%	3%	3%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			2	
Permitted Phases	4			8			2			2		
Actuated Green, G (s)	59.0	59.0		58.3	58.3		21.3	21.3		21.3	21.3	
Effective Green, g (s)	59.0	59.0		58.3	58.3		21.3	21.3		21.3	21.3	
Actuated g/C Ratio	0.66	0.66		0.65	0.65		0.24	0.24		0.24	0.24	
Clearance Time (s)	4.5	4.5		5.2	5.2		5.2	5.2		5.2	5.2	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	401	1213		506	1150		211	432		132	418	
v/s Ratio Prot		0.27			c0.36			c0.17			0.12	
v/s Ratio Perm	0.11			0.05			0.05			0.02		
v/c Ratio	0.16	0.41		0.08	0.56		0.20	0.74		0.08	0.50	
Uniform Delay, d1	6.0	7.3		5.9	8.8		27.5	31.8		26.7	29.8	
Progression Factor	0.85	0.85		0.92	0.71		0.88	0.96		1.00	1.00	
Incremental Delay, d2	0.5	0.6		0.1	0.7		0.5	6.2		0.3	1.0	
Delay (s)	5.6	6.8		5.5	6.9		24.8	36.7		27.0	30.7	
Level of Service	A	A		A	A		C	D		C	C	
Approach Delay (s)		6.7			6.8			35.3			30.6	
Approach LOS		A			A			D			C	

Intersection Summary			
HCM Average Control Delay	15.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.4
Intersection Capacity Utilization	83.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	290	300	80	220	490	40	120	340	300	10	90	370
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.2	4.2	4.0	4.2	4.2	4.2	4.0		4.0	4.2	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93		1.00	0.88	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1732		1770	1638	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583	1770	1732		1770	1638	
Peak-hour factor, PHF	0.92	0.92	0.92	0.96	0.96	0.96	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	315	326	87	229	510	42	130	370	326	11	98	402
RTOR Reduction (vph)	0	0	61	0	0	13	0	35	0	0	164	0
Lane Group Flow (vph)	315	326	26	229	510	29	130	661	0	11	336	0
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		2	5		6	1	
Permitted Phases			4			8						
Actuated Green, G (s)	6.0	27.4	27.4	6.0	27.4	27.4	19.0	34.0		6.4	21.0	
Effective Green, g (s)	6.0	27.4	27.4	6.0	27.4	27.4	19.0	34.0		6.4	21.0	
Actuated g/C Ratio	0.07	0.30	0.30	0.07	0.30	0.30	0.21	0.38		0.07	0.23	
Clearance Time (s)	4.0	4.2	4.2	4.0	4.2	4.2	4.2	4.0		4.0	4.2	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	118	567	482	118	567	482	374	654		126	382	
v/s Ratio Prot	c0.18	0.18		0.13	c0.27		c0.07	c0.38		0.01	0.21	
v/s Ratio Perm			0.02			0.02						
v/c Ratio	2.67	0.57	0.05	1.94	0.90	0.06	0.35	1.01		0.09	0.88	
Uniform Delay, d1	42.0	26.4	22.1	42.0	30.0	22.2	30.2	28.0		39.1	33.3	
Progression Factor	1.00	1.00	1.00	1.04	0.91	0.92	0.51	0.79		1.00	1.00	
Incremental Delay, d2	774.9	4.2	0.2	450.2	18.4	0.2	0.2	13.1		1.4	23.9	
Delay (s)	816.9	30.6	22.4	494.0	45.7	20.7	15.5	35.2		40.4	57.1	
Level of Service	F	C	C	F	D	C	B	D		D	E	
Approach Delay (s)		369.8			175.8			32.1			56.8	
Approach LOS		F			F			C			E	

Intersection Summary			
HCM Average Control Delay	162.4	HCM Level of Service	F
HCM Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.2
Intersection Capacity Utilization	96.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	130	90	80	70	20	50	650	240	190	210	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2	4.2	4.2	4.2			4.2	4.2	4.6	4.6	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.97			1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1800			1856	1583	1770	1838	
Flt Permitted	0.69	1.00	1.00	0.62	1.00			0.25	1.00	0.38	1.00	
Satd. Flow (perm)	1292	1863	1583	1155	1800			463	1583	702	1838	
Peak-hour factor, PHF	0.96	0.96	0.96	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	31	135	94	87	76	22	54	707	261	207	228	22
RTOR Reduction (vph)	0	0	73	0	12	0	0	0	69	0	4	0
Lane Group Flow (vph)	31	135	21	87	86	0	0	761	192	207	246	0
Turn Type	Perm		Perm	Perm			Perm		Perm	Perm		
Protected Phases		4			8			1			2	
Permitted Phases	4		4	8			1		1	2		
Actuated Green, G (s)	19.8	19.8	19.8	19.8	19.8			39.8	39.8	17.4	17.4	
Effective Green, g (s)	19.8	19.8	19.8	19.8	19.8			39.8	39.8	17.4	17.4	
Actuated g/C Ratio	0.22	0.22	0.22	0.22	0.22			0.44	0.44	0.19	0.19	
Clearance Time (s)	4.2	4.2	4.2	4.2	4.2			4.2	4.2	4.6	4.6	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0			2.0	2.0	3.8	3.8	
Lane Grp Cap (vph)	284	410	348	254	396			205	700	136	355	
v/s Ratio Prot		0.07			0.05						0.13	
v/s Ratio Perm	0.02		0.01	c0.08				c1.64	0.12	c0.29		
v/c Ratio	0.11	0.33	0.06	0.34	0.22			3.71	0.27	1.52	0.69	
Uniform Delay, d1	28.1	29.5	27.7	29.6	28.8			25.1	15.9	36.3	33.8	
Progression Factor	1.00	1.00	1.00	0.95	0.94			1.00	1.00	1.08	0.99	
Incremental Delay, d2	0.8	2.1	0.3	3.6	1.3			1232.4	1.0	238.3	1.0	
Delay (s)	28.8	31.7	28.1	31.9	28.4			1257.5	16.9	277.7	34.5	
Level of Service	C	C	C	C	C			F	B	F	C	
Approach Delay (s)		30.0			30.0			940.7			144.6	
Approach LOS		C			C			F			F	

Intersection Summary			
HCM Average Control Delay	541.0	HCM Level of Service	F
HCM Volume to Capacity ratio	2.35		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	95.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	150	420	40	220	150	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.2	4.2		4.5	4.5
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.89		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1845	1650		1719	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	1845	1650		1719	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	1.00	1.00
Adj. Flow (vph)	163	457	43	239	150	80
RTOR Reduction (vph)	0	0	110	0	0	67
Lane Group Flow (vph)	163	457	172	0	150	13
Heavy Vehicles (%)	2%	3%	2%	2%	5%	2%
Turn Type	Prot					Perm
Protected Phases	7	4	8		2	
Permitted Phases						2
Actuated Green, G (s)	13.5	66.6	48.6		14.7	14.7
Effective Green, g (s)	13.5	66.6	48.6		14.7	14.7
Actuated g/C Ratio	0.15	0.74	0.54		0.16	0.16
Clearance Time (s)	4.5	4.2	4.2		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	266	1365	891		281	259
v/s Ratio Prot	c0.09	c0.25	0.10		c0.09	
v/s Ratio Perm						0.01
v/c Ratio	0.61	0.33	0.19		0.53	0.05
Uniform Delay, d1	35.8	4.0	10.6		34.5	31.8
Progression Factor	0.90	0.96	0.55		1.24	2.08
Incremental Delay, d2	2.8	0.4	0.3		1.9	0.1
Delay (s)	34.9	4.3	6.2		44.7	66.0
Level of Service	C	A	A		D	E
Approach Delay (s)		12.4	6.2		52.1	
Approach LOS		B	A		D	

Intersection Summary			
HCM Average Control Delay	18.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.2
Intersection Capacity Utilization	43.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	540	50	0	0	0	260	520	50	130	180	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2					4.5	4.2		4.5	4.2	
Lane Util. Factor	1.00	1.00					1.00	1.00		1.00	1.00	
Frt	1.00	0.99					1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00					0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1839					1770	1838		1770	1822	
Flt Permitted	0.95	1.00					0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1839					1770	1838		1770	1822	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	587	54	0	0	0	283	565	54	141	196	33
RTOR Reduction (vph)	0	4	0	0	0	0	0	4	0	0	7	0
Lane Group Flow (vph)	54	637	0	0	0	0	283	615	0	141	222	0
Turn Type	Perm						Prot			Prot		
Protected Phases		8					1	6		5	2	
Permitted Phases	8											
Actuated Green, G (s)	34.5	34.5					16.6	33.9		8.7	26.0	
Effective Green, g (s)	34.5	34.5					16.6	33.9		8.7	26.0	
Actuated g/C Ratio	0.38	0.38					0.18	0.38		0.10	0.29	
Clearance Time (s)	4.2	4.2					4.5	4.2		4.5	4.2	
Vehicle Extension (s)	3.0	3.0					3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	679	705					326	692		171	526	
v/s Ratio Prot		c0.35					0.16	c0.33		c0.08	0.12	
v/s Ratio Perm	0.03											
v/c Ratio	0.08	0.90					0.87	0.89		0.82	0.42	
Uniform Delay, d1	17.7	26.2					35.6	26.3		39.9	25.9	
Progression Factor	1.08	1.10					0.96	0.94		1.34	1.83	
Incremental Delay, d2	0.2	16.8					5.8	3.5		10.1	0.2	
Delay (s)	19.2	45.7					39.9	28.4		63.6	47.5	
Level of Service	B	D					D	C		E	D	
Approach Delay (s)		43.6			0.0			32.0			53.6	
Approach LOS		D			A			C			D	

Intersection Summary			
HCM Average Control Delay	40.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.9
Intersection Capacity Utilization	79.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	290	760	160	110	890	10	270	330	190	10	240	340
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	1.00		1.00	0.95		1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3447		1770	3533		1770	1761		1770	1699	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3447		1770	3533		1770	1761		1770	1699	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	315	826	174	120	967	11	293	359	207	11	261	370
RTOR Reduction (vph)	0	21	0	0	1	0	0	21	0	0	54	0
Lane Group Flow (vph)	315	979	0	120	977	0	293	545	0	11	577	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	13.5	28.9		5.5	20.9		11.5	36.9		0.7	26.1	
Effective Green, g (s)	13.5	28.9		5.5	20.9		11.5	36.9		0.7	26.1	
Actuated g/C Ratio	0.15	0.32		0.06	0.23		0.13	0.41		0.01	0.29	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	266	1107		108	820		226	722		14	493	
v/s Ratio Prot	c0.18	0.28		0.07	c0.28		c0.17	0.31		0.01	c0.34	
v/s Ratio Perm												
v/c Ratio	1.18	0.88		1.11	1.19		1.30	0.76		0.79	1.17	
Uniform Delay, d1	38.2	29.0		42.2	34.5		39.2	22.7		44.6	31.9	
Progression Factor	1.00	1.00		0.99	1.36		1.03	0.81		1.00	1.00	
Incremental Delay, d2	114.4	10.4		110.7	96.2		160.8	4.3		130.6	96.6	
Delay (s)	152.7	39.3		152.6	143.3		201.2	22.6		175.1	128.6	
Level of Service	F	D		F	F		F	C		F	F	
Approach Delay (s)		66.5			144.3			83.5			129.4	
Approach LOS		E			F			F			F	

Intersection Summary			
HCM Average Control Delay	102.4	HCM Level of Service	F
HCM Volume to Capacity ratio	1.20		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	104.4%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	130	690	100	130	560	140	130	530	100	200	220	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.2		4.1	4.2		4.1	4.2		4.1	4.2	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.97		1.00	0.98		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3472		1770	3433		1770	1818		1770	1764	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3472		1770	3433		1770	1818		1770	1764	
Peak-hour factor, PHF	0.96	0.96	0.96	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	135	719	104	141	609	152	141	576	109	217	239	130
RTOR Reduction (vph)	0	12	0	0	25	0	0	7	0	0	22	0
Lane Group Flow (vph)	135	811	0	141	736	0	141	678	0	217	347	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	8.0	24.2		8.5	24.7		10.6	29.0		11.7	30.1	
Effective Green, g (s)	8.0	24.2		8.5	24.7		10.6	29.0		11.7	30.1	
Actuated g/C Ratio	0.09	0.27		0.09	0.27		0.12	0.32		0.13	0.33	
Clearance Time (s)	4.1	4.2		4.1	4.2		4.1	4.2		4.1	4.2	
Vehicle Extension (s)	3.0	5.0		3.0	5.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	157	934		167	942		208	586		230	590	
v/s Ratio Prot	0.08	c0.23		c0.08	0.21		0.08	c0.37		c0.12	0.20	
v/s Ratio Perm												
v/c Ratio	0.86	0.87		0.84	0.78		0.68	1.16		0.94	0.59	
Uniform Delay, d1	40.4	31.4		40.1	30.2		38.1	30.5		38.8	24.8	
Progression Factor	0.81	1.41		1.00	1.00		0.90	1.35		0.90	0.61	
Incremental Delay, d2	23.5	6.8		30.3	6.4		5.9	83.4		43.2	4.2	
Delay (s)	56.1	51.0		70.4	36.6		40.0	124.7		78.1	19.4	
Level of Service	E	D		E	D		D	F		E	B	
Approach Delay (s)		51.7			41.9			110.3			41.1	
Approach LOS		D			D			F			D	

Intersection Summary			
HCM Average Control Delay	61.9	HCM Level of Service	E
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.4
Intersection Capacity Utilization	88.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	80	440	120	40	420	210	130	330	50	210	290	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2		4.2	4.2		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.95		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3426		1770	3363		1770	1826		1770	1863	1583
Flt Permitted	0.26	1.00		0.31	1.00		0.52	1.00		0.44	1.00	1.00
Satd. Flow (perm)	491	3426		579	3363		973	1826		821	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	87	478	130	43	457	228	141	359	54	228	315	54
RTOR Reduction (vph)	0	27	0	0	69	0	0	6	0	0	0	24
Lane Group Flow (vph)	87	581	0	43	616	0	141	407	0	228	315	30
Turn Type	Perm			Perm			Perm			Perm		Perm
Protected Phases		8			4			6			2	
Permitted Phases	8			4			6			2		2
Actuated Green, G (s)	31.8	31.8		31.8	31.8		49.5	49.5		49.5	49.5	49.5
Effective Green, g (s)	31.8	31.8		31.8	31.8		49.5	49.5		49.5	49.5	49.5
Actuated g/C Ratio	0.35	0.35		0.35	0.35		0.55	0.55		0.55	0.55	0.55
Clearance Time (s)	4.2	4.2		4.2	4.2		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	173	1211		205	1188		535	1004		452	1025	871
v/s Ratio Prot		0.17			c0.18			0.22			0.17	
v/s Ratio Perm	0.18			0.07			0.14			c0.28		0.02
v/c Ratio	0.50	0.48		0.21	0.52		0.26	0.41		0.50	0.31	0.03
Uniform Delay, d1	22.9	22.7		20.3	23.0		10.7	11.7		12.6	11.0	9.3
Progression Factor	1.00	1.00		1.92	1.92		1.00	1.00		1.53	1.54	2.42
Incremental Delay, d2	10.1	1.4		1.5	1.1		1.2	1.2		0.4	0.1	0.0
Delay (s)	33.0	24.0		40.5	45.2		11.9	12.9		19.7	17.0	22.5
Level of Service	C	C		D	D		B	B		B	B	C
Approach Delay (s)		25.1			45.0			12.7			18.5	
Approach LOS		C			D			B			B	

Intersection Summary			
HCM Average Control Delay	26.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.7
Intersection Capacity Utilization	95.7%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	700	60	40	610	230	60	410	50	170	440	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.2		4.0	4.2		4.0	4.2		4.0	4.2	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.96		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3497		1770	3394		1770	1833		1770	1834	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3497		1770	3394		1770	1833		1770	1834	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.96	0.96	0.96
Adj. Flow (vph)	54	761	65	43	663	250	65	446	54	177	458	52
RTOR Reduction (vph)	0	7	0	0	42	0	0	5	0	0	4	0
Lane Group Flow (vph)	54	819	0	43	871	0	65	495	0	177	506	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	4.2	31.4		2.4	29.6		4.8	28.6		11.2	35.0	
Effective Green, g (s)	4.2	31.4		2.4	29.6		4.8	28.6		11.2	35.0	
Actuated g/C Ratio	0.05	0.35		0.03	0.33		0.05	0.32		0.12	0.39	
Clearance Time (s)	4.0	4.2		4.0	4.2		4.0	4.2		4.0	4.2	
Vehicle Extension (s)	2.0	5.0		2.0	5.0		2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	83	1220		47	1116		94	582		220	713	
v/s Ratio Prot	c0.03	0.23		0.02	c0.26		0.04	c0.27		c0.10	0.28	
v/s Ratio Perm												
v/c Ratio	0.65	0.67		0.91	0.78		0.69	0.85		0.80	0.71	
Uniform Delay, d1	42.2	24.9		43.7	27.3		41.9	28.7		38.3	23.2	
Progression Factor	1.04	0.97		1.00	1.00		1.00	1.00		1.19	0.80	
Incremental Delay, d2	12.1	2.7		97.4	5.4		16.2	12.5		15.9	3.5	
Delay (s)	55.9	26.9		141.1	32.7		58.1	41.2		61.4	22.1	
Level of Service	E	C		F	C		E	D		E	C	
Approach Delay (s)		28.7			37.6			43.1			32.2	
Approach LOS		C			D			D			C	

Intersection Summary			
HCM Average Control Delay	34.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.4
Intersection Capacity Utilization	75.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	120	0	200	0	260	50	260	260	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.2	4.2		4.2	4.2	4.0	4.2	
Lane Util. Factor					1.00	1.00		1.00	1.00	1.00	1.00	
Frt					1.00	0.85		1.00	0.85	1.00	1.00	
Flt Protected					0.95	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)					1770	1583		1863	1583	1770	1863	
Flt Permitted					0.95	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)					1770	1583		1863	1583	1770	1863	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	130	0	217	0	283	54	283	283	0
RTOR Reduction (vph)	0	0	0	0	0	133	0	0	41	0	0	0
Lane Group Flow (vph)	0	0	0	0	130	84	0	283	13	283	283	0
Turn Type				Split		Perm	Perm		Perm	Prot		
Protected Phases				4	4			6		5	2	
Permitted Phases						4	6		6			
Actuated Green, G (s)					30.3	30.3		18.7	18.7	16.7	39.4	
Effective Green, g (s)					30.3	30.3		18.7	18.7	16.7	39.4	
Actuated g/C Ratio					0.39	0.39		0.24	0.24	0.21	0.50	
Clearance Time (s)					4.2	4.2		4.2	4.2	4.0	4.2	
Vehicle Extension (s)					3.0	3.0		4.8	4.8	3.0	4.8	
Lane Grp Cap (vph)					687	614		446	379	378	940	
v/s Ratio Prot					c0.07			c0.15		c0.16	0.15	
v/s Ratio Perm						0.05			0.01			
v/c Ratio					0.19	0.14		0.63	0.03	0.75	0.30	
Uniform Delay, d1					15.8	15.4		26.6	22.8	28.7	11.3	
Progression Factor					1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2					0.6	0.5		3.9	0.1	7.9	0.4	
Delay (s)					16.4	15.9		30.6	22.8	36.6	11.7	
Level of Service					B	B		C	C	D	B	
Approach Delay (s)		0.0			16.1			29.3			24.1	
Approach LOS		A			B			C			C	

Intersection Summary			
HCM Average Control Delay	23.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	78.1	Sum of lost time (s)	12.4
Intersection Capacity Utilization	45.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	110	10	20	270	10	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.2	4.2
Lane Util. Factor	1.00		1.00	1.00	1.00	1.00
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	1825		1770	1863	1641	1583
Flt Permitted	1.00		0.67	1.00	0.95	1.00
Satd. Flow (perm)	1825		1254	1863	1641	1583
Peak-hour factor, PHF	0.92	0.92	1.00	1.00	1.00	1.00
Adj. Flow (vph)	120	11	20	270	10	20
RTOR Reduction (vph)	6	0	0	0	0	13
Lane Group Flow (vph)	126	0	20	270	10	7
Heavy Vehicles (%)	3%	2%	2%	2%	10%	2%
Turn Type			Perm			custom
Protected Phases	8			4		
Permitted Phases			4		6	6
Actuated Green, G (s)	30.0		30.0	30.0	21.8	21.8
Effective Green, g (s)	30.0		30.0	30.0	21.8	21.8
Actuated g/C Ratio	0.50		0.50	0.50	0.36	0.36
Clearance Time (s)	4.0		4.0	4.0	4.2	4.2
Lane Grp Cap (vph)	913		627	932	596	575
v/s Ratio Prot	0.07			c0.14		
v/s Ratio Perm			0.02		c0.01	0.00
v/c Ratio	0.14		0.03	0.29	0.02	0.01
Uniform Delay, d1	8.1		7.6	8.8	12.2	12.2
Progression Factor	1.00		0.93	0.93	1.00	1.00
Incremental Delay, d2	0.3		0.1	0.8	0.1	0.0
Delay (s)	8.4		7.2	8.9	12.3	12.3
Level of Service	A		A	A	B	B
Approach Delay (s)	8.4			8.8	12.3	
Approach LOS	A			A	B	

Intersection Summary			
HCM Average Control Delay	8.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.17		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.2
Intersection Capacity Utilization	47.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	110	80	140	200	40	130	320	30	110	350	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2		4.2	4.2		4.2	4.2		4.2	4.2	4.2
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.94		1.00	0.98		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1745		1770	1817		1770	1839		1770	1863	1583
Flt Permitted	0.56	1.00		0.62	1.00		0.44	1.00		0.44	1.00	1.00
Satd. Flow (perm)	1037	1745		1152	1817		824	1839		822	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	65	120	87	152	217	43	141	348	33	120	380	54
RTOR Reduction (vph)	0	43	0	0	12	0	0	6	0	0	0	25
Lane Group Flow (vph)	65	164	0	152	248	0	141	375	0	120	380	29
Turn Type	Perm			Perm			Perm			Perm		Perm
Protected Phases		8			4			6			2	
Permitted Phases	8			4			6			2		2
Actuated Green, G (s)	24.8	24.8		24.8	24.8		26.8	26.8		26.8	26.8	26.8
Effective Green, g (s)	24.8	24.8		24.8	24.8		26.8	26.8		26.8	26.8	26.8
Actuated g/C Ratio	0.41	0.41		0.41	0.41		0.45	0.45		0.45	0.45	0.45
Clearance Time (s)	4.2	4.2		4.2	4.2		4.2	4.2		4.2	4.2	4.2
Lane Grp Cap (vph)	429	721		476	751		368	821		367	832	707
v/s Ratio Prot		0.09			c0.14			c0.20			0.20	
v/s Ratio Perm	0.06			0.13			0.17			0.15		0.02
v/c Ratio	0.15	0.23		0.32	0.33		0.38	0.46		0.33	0.46	0.04
Uniform Delay, d1	11.0	11.4		11.9	12.0		11.1	11.5		10.8	11.5	9.4
Progression Factor	0.92	0.89		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.7	0.7		1.8	1.2		3.0	1.8		2.4	1.8	0.1
Delay (s)	10.9	10.8		13.7	13.1		14.1	13.4		13.1	13.3	9.5
Level of Service	B	B		B	B		B	B		B	B	A
Approach Delay (s)		10.8			13.3			13.6			12.9	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM Average Control Delay	12.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.4
Intersection Capacity Utilization	94.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	190	1000	30	10	1170	120	40	20	10	70	20	330
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	207	1087	33	11	1272	130	43	22	11	76	22	359
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					400							
pX, platoon unblocked	0.79						0.79	0.79		0.79	0.79	0.79
vC, conflicting volume	1402			1120			2543	2940	560	2337	2891	701
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	976			1120			2422	2924	560	2160	2862	88
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	63			98			0	0	98	0	0	52
cM capacity (veh/h)	555			620			0	7	472	0	8	752

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	207	725	395	11	848	554	76	457
Volume Left	207	0	0	11	0	0	43	76
Volume Right	0	0	33	0	0	130	11	359
cSH	555	1700	1700	620	1700	1700	0	0
Volume to Capacity	0.37	0.43	0.23	0.02	0.50	0.33	Err	Err
Queue Length 95th (ft)	43	0	0	1	0	0	Err	Err
Control Delay (s)	15.3	0.0	0.0	10.9	0.0	0.0	Err	Err
Lane LOS	C			B			F	F
Approach Delay (s)	2.4			0.1			Err	Err
Approach LOS							F	F

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	82.1%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	700	320	40	1050	20	230	20	20	160	130	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.2		4.0	4.2		5.6	5.6		5.6	5.6	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	1.00		1.00	0.93		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3373		1770	3529		1770	1723		1770	1825	
Flt Permitted	0.95	1.00		0.95	1.00		0.62	1.00		0.73	1.00	
Satd. Flow (perm)	1770	3373		1770	3529		1160	1723		1357	1825	
Peak-hour factor, PHF	0.92	0.92	0.92	0.95	0.95	0.95	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	761	348	42	1105	21	250	22	22	174	141	22
RTOR Reduction (vph)	0	46	0	0	1	0	0	16	0	0	7	0
Lane Group Flow (vph)	22	1063	0	42	1125	0	250	28	0	174	156	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	3.2	48.5		4.8	50.1		22.9	22.9		22.9	22.9	
Effective Green, g (s)	3.2	48.5		4.8	50.1		22.9	22.9		22.9	22.9	
Actuated g/C Ratio	0.04	0.54		0.05	0.56		0.25	0.25		0.25	0.25	
Clearance Time (s)	4.0	4.2		4.0	4.2		5.6	5.6		5.6	5.6	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	63	1818		94	1964		295	438		345	464	
v/s Ratio Prot	0.01	c0.32		0.02	c0.32			0.02			0.09	
v/s Ratio Perm							c0.22			0.13		
v/c Ratio	0.35	0.58		0.45	0.57		0.85	0.06		0.50	0.34	
Uniform Delay, d1	42.4	14.0		41.3	13.0		31.9	25.4		28.7	27.3	
Progression Factor	1.00	1.00		1.15	0.56		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.2	1.4		0.6	0.6		18.9	0.0		0.4	0.2	
Delay (s)	43.6	15.4		48.3	7.9		50.8	25.4		29.1	27.5	
Level of Service	D	B		D	A		D	C		C	C	
Approach Delay (s)		15.9			9.4			47.0			28.3	
Approach LOS		B			A			D			C	

Intersection Summary			
HCM Average Control Delay	17.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	68.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	750	120	80	880	200	200	300	70	110	410	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.2		4.0	4.2		4.2	4.2	4.2	4.2	4.2	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	0.97		1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3466		1770	3441		1770	1863	1583	1770	1827	
Flt Permitted	0.95	1.00		0.95	1.00		0.27	1.00	1.00	0.45	1.00	
Satd. Flow (perm)	1770	3466		1770	3441		499	1863	1583	846	1827	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	815	130	87	957	217	217	326	76	120	446	65
RTOR Reduction (vph)	0	13	0	0	20	0	0	0	30	0	6	0
Lane Group Flow (vph)	54	932	0	87	1154	0	217	326	46	120	505	0
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	4.8	35.0		4.8	35.0		37.8	37.8	37.8	37.8	37.8	
Effective Green, g (s)	4.8	35.0		4.8	35.0		37.8	37.8	37.8	37.8	37.8	
Actuated g/C Ratio	0.05	0.39		0.05	0.39		0.42	0.42	0.42	0.42	0.42	
Clearance Time (s)	4.0	4.2		4.0	4.2		4.2	4.2	4.2	4.2	4.2	
Vehicle Extension (s)	2.0	4.8		2.0	4.8		4.8	4.8	4.8	4.8	4.8	
Lane Grp Cap (vph)	94	1348		94	1338		210	782	665	355	767	
v/s Ratio Prot	0.03	c0.27		0.05	c0.34			0.18			0.28	
v/s Ratio Perm							c0.43		0.03	0.14		
v/c Ratio	0.57	0.69		0.93	0.86		1.03	0.42	0.07	0.34	0.66	
Uniform Delay, d1	41.6	23.0		42.4	25.3		26.1	18.4	15.6	17.6	20.9	
Progression Factor	0.81	0.83		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	4.6	2.6		67.6	7.5		71.1	0.7	0.1	1.1	2.6	
Delay (s)	38.2	21.7		110.0	32.8		97.2	19.1	15.7	18.7	23.6	
Level of Service	D	C		F	C		F	B	B	B	C	
Approach Delay (s)		22.6			38.2			46.0			22.6	
Approach LOS		C			D			D			C	

Intersection Summary			
HCM Average Control Delay	32.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.6
Intersection Capacity Utilization	85.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

APPENDIX F:
TECHNICAL CALCULATIONS –
CUMULATIVE PLUS PROJECT CONDITIONS –
MALL OPEN TO TRAFFIC ALTERNATIVES

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	400	10	50	420	30	80	290	10	80	410	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.2		4.0	4.2		4.2	4.2			4.2	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frt	1.00	1.00		1.00	0.99		1.00	0.99			0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1770	1856		1770	1844		1770	1853			1830	
Flt Permitted	0.95	1.00		0.95	1.00		0.35	1.00			0.87	
Satd. Flow (perm)	1770	1856		1770	1844		652	1853			1601	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.93	0.93	0.93	0.92	0.92	0.92
Adj. Flow (vph)	98	435	11	54	457	33	86	312	11	87	446	43
RTOR Reduction (vph)	0	1	0	0	3	0	0	2	0	0	3	0
Lane Group Flow (vph)	98	445	0	54	487	0	86	321	0	0	573	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			6			2	
Permitted Phases							6			2		
Actuated Green, G (s)	7.8	33.8		4.0	30.0		39.8	39.8			39.8	
Effective Green, g (s)	7.8	33.8		4.0	30.0		39.8	39.8			39.8	
Actuated g/C Ratio	0.09	0.38		0.04	0.33		0.44	0.44			0.44	
Clearance Time (s)	4.0	4.2		4.0	4.2		4.2	4.2			4.2	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	153	697		79	615		288	819			708	
v/s Ratio Prot	c0.06	0.24		0.03	c0.26			0.17				
v/s Ratio Perm							0.13				c0.36	
v/c Ratio	0.64	0.64		0.68	0.79		0.30	0.39			0.81	
Uniform Delay, d1	39.7	23.1		42.4	27.2		16.1	16.9			21.8	
Progression Factor	0.60	0.83		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	8.2	4.1		21.7	10.1		2.6	1.4			9.7	
Delay (s)	31.9	23.3		64.1	37.3		18.8	18.4			31.5	
Level of Service	C	C		E	D		B	B			C	
Approach Delay (s)		24.8			39.9			18.4			31.5	
Approach LOS		C			D			B			C	

Intersection Summary			
HCM Average Control Delay	29.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.4
Intersection Capacity Utilization	94.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	410	60	80	370	10	10	20	20	10	390	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		5.4	5.4		5.4	5.4		5.4	5.4	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	1.00		1.00	0.93		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1827		1770	1817		1770	1723		1770	1788	
Flt Permitted	0.47	1.00		0.35	1.00		0.19	1.00		0.73	1.00	
Satd. Flow (perm)	873	1827		650	1817		358	1723		1357	1788	
Peak-hour factor, PHF	0.92	0.92	0.92	1.00	1.00	1.00	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	446	65	80	370	10	11	22	22	11	424	109
RTOR Reduction (vph)	0	5	0	0	1	0	0	14	0	0	12	0
Lane Group Flow (vph)	11	506	0	80	379	0	11	30	0	11	521	0
Heavy Vehicles (%)	2%	2%	2%	2%	4%	10%	2%	2%	2%	2%	3%	3%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			2	
Permitted Phases	4			8			2			2		
Actuated Green, G (s)	48.4	48.4		47.0	47.0		32.2	32.2		32.2	32.2	
Effective Green, g (s)	48.4	48.4		47.0	47.0		32.2	32.2		32.2	32.2	
Actuated g/C Ratio	0.54	0.54		0.52	0.52		0.36	0.36		0.36	0.36	
Clearance Time (s)	4.0	4.0		5.4	5.4		5.4	5.4		5.4	5.4	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	469	983		339	949		128	616		486	640	
v/s Ratio Prot		c0.28			0.21			0.02			c0.29	
v/s Ratio Perm	0.01			0.12			0.03			0.01		
v/c Ratio	0.02	0.51		0.24	0.40		0.09	0.05		0.02	0.81	
Uniform Delay, d1	9.7	13.3		11.7	13.0		19.1	18.9		18.7	26.2	
Progression Factor	0.78	0.57		0.70	0.63		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	1.3		1.1	0.9		0.3	0.0		0.0	7.9	
Delay (s)	7.6	8.9		9.3	9.1		19.4	18.9		18.7	34.1	
Level of Service	A	A		A	A		B	B		B	C	
Approach Delay (s)		8.9			9.1			19.0			33.8	
Approach LOS		A			A			B			C	

Intersection Summary			
HCM Average Control Delay	17.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.4
Intersection Capacity Utilization	89.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	300	360	210	330	280	10	50	120	180	30	230	250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.2	4.2	4.5	4.2	4.2	4.2	4.5		4.5	4.2	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.91		1.00	0.92	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1695		1770	1717	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583	1770	1695		1770	1717	
Peak-hour factor, PHF	0.92	0.92	0.92	0.96	0.96	0.96	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	326	391	228	344	292	10	54	130	196	33	250	272
RTOR Reduction (vph)	0	0	175	0	0	5	0	56	0	0	43	0
Lane Group Flow (vph)	326	391	53	344	292	5	54	270	0	33	479	0
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		2	5		6	1	
Permitted Phases			4			8						
Actuated Green, G (s)	19.1	20.8	20.8	19.5	21.7	21.7	7.8	27.8		4.2	24.8	
Effective Green, g (s)	19.1	20.8	20.8	19.5	21.7	21.7	7.8	27.8		4.2	24.8	
Actuated g/C Ratio	0.21	0.23	0.23	0.22	0.24	0.24	0.09	0.31		0.05	0.28	
Clearance Time (s)	4.0	4.2	4.2	4.5	4.2	4.2	4.2	4.5		4.5	4.2	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	376	431	366	384	449	382	153	524		83	473	
v/s Ratio Prot	0.18	c0.21		c0.19	0.16		0.03	c0.16		0.02	c0.28	
v/s Ratio Perm			0.03			0.00						
v/c Ratio	0.87	0.91	0.14	0.90	0.65	0.01	0.35	0.52		0.40	1.01	
Uniform Delay, d1	34.2	33.7	27.5	34.3	30.7	26.0	38.7	25.6		41.7	32.6	
Progression Factor	1.00	1.00	1.00	0.89	0.88	0.78	1.00	1.00		1.00	1.00	
Incremental Delay, d2	18.5	25.4	0.8	25.1	6.8	0.1	6.3	3.6		3.1	44.3	
Delay (s)	52.7	59.1	28.3	55.6	33.8	20.2	45.0	29.2		44.8	76.9	
Level of Service	D	E	C	E	C	C	D	C		D	E	
Approach Delay (s)		49.5			45.2			31.4			75.0	
Approach LOS		D			D			C			E	

Intersection Summary			
HCM Average Control Delay	51.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.9
Intersection Capacity Utilization	83.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	70	70	160	60	210	30	110	60	110	550	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2	4.2	4.2	4.2			4.2	4.2	4.6	4.6	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.88			1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.99	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1645			1843	1583	1770	1858	
Flt Permitted	0.36	1.00	1.00	0.71	1.00			0.79	1.00	0.12	1.00	
Satd. Flow (perm)	665	1863	1583	1322	1645			1473	1583	217	1858	
Peak-hour factor, PHF	0.96	0.96	0.96	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	31	73	73	174	65	228	33	120	65	120	598	11
RTOR Reduction (vph)	0	0	55	0	158	0	0	0	54	0	1	0
Lane Group Flow (vph)	31	73	18	174	135	0	0	153	11	120	608	0
Turn Type	Perm		Perm	Perm			Perm		Perm	Perm		
Protected Phases		4			8			1			2	
Permitted Phases	4		4	8			1		1	2		
Actuated Green, G (s)	19.6	19.6	19.6	19.6	19.6			13.0	13.0	34.4	34.4	
Effective Green, g (s)	19.6	19.6	19.6	19.6	19.6			13.0	13.0	34.4	34.4	
Actuated g/C Ratio	0.25	0.25	0.25	0.25	0.25			0.16	0.16	0.43	0.43	
Clearance Time (s)	4.2	4.2	4.2	4.2	4.2			4.2	4.2	4.6	4.6	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0			2.0	2.0	3.8	3.8	
Lane Grp Cap (vph)	163	456	388	324	403			239	257	93	799	
v/s Ratio Prot		0.04			0.08						0.33	
v/s Ratio Perm	0.05		0.01	c0.13				c0.10	0.01	c0.55		
v/c Ratio	0.19	0.16	0.05	0.54	0.34			0.64	0.04	1.29	0.76	
Uniform Delay, d1	23.9	23.7	23.1	26.3	24.8			31.3	28.2	22.8	19.3	
Progression Factor	1.00	1.00	1.00	0.77	0.74			1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.6	0.8	0.2	6.1	2.2			12.4	0.3	189.8	6.8	
Delay (s)	26.5	24.5	23.3	26.4	20.5			43.8	28.5	212.6	26.1	
Level of Service	C	C	C	C	C			D	C	F	C	
Approach Delay (s)		24.3			22.7			39.2			56.8	
Approach LOS		C			C			D			E	

Intersection Summary			
HCM Average Control Delay	40.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	72.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	120	10	10	210	20	10	10	10	330	50	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.2		4.2	4.2			4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99			0.95		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00			0.98		0.95	1.00	
Satd. Flow (prot)	1770	1824		1770	1838			1750		1719	1648	
Flt Permitted	0.95	1.00		0.67	1.00			0.91		0.74	1.00	
Satd. Flow (perm)	1770	1824		1243	1838			1618		1331	1648	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	1.00	0.92	1.00
Adj. Flow (vph)	43	130	11	11	228	22	11	11	11	330	54	180
RTOR Reduction (vph)	0	4	0	0	4	0	0	7	0	0	120	0
Lane Group Flow (vph)	43	138	0	11	246	0	0	26	0	330	114	0
Heavy Vehicles (%)	2%	3%	2%	2%	2%	2%	2%	2%	2%	5%	2%	2%
Turn Type	Prot			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases				8			2			6		
Actuated Green, G (s)	3.4	45.0		37.6	37.6			26.8		26.8	26.8	
Effective Green, g (s)	3.4	45.0		37.6	37.6			26.8		26.8	26.8	
Actuated g/C Ratio	0.04	0.56		0.47	0.47			0.34		0.34	0.34	
Clearance Time (s)	4.0	4.2		4.2	4.2			4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	75	1026		584	864			542		446	552	
v/s Ratio Prot	c0.02	0.08			c0.13						0.07	
v/s Ratio Perm				0.01				0.02		c0.25		
v/c Ratio	0.57	0.13		0.02	0.28			0.05		0.74	0.21	
Uniform Delay, d1	37.6	8.3		11.3	13.0			18.0		23.5	19.0	
Progression Factor	0.93	0.78		1.78	1.98			1.00		1.00	1.00	
Incremental Delay, d2	7.3	0.2		0.0	0.4			0.0		6.3	0.2	
Delay (s)	42.1	6.6		20.2	26.0			18.0		29.9	19.2	
Level of Service	D	A		C	C			B		C	B	
Approach Delay (s)		14.9			25.8			18.0			25.4	
Approach LOS		B			C			B			C	

Intersection Summary			
HCM Average Control Delay	23.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.2
Intersection Capacity Utilization	65.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	210	120	0	0	0	200	340	60	60	280	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2					4.0	4.2		4.0	4.2	
Lane Util. Factor	1.00	1.00					1.00	1.00		1.00	1.00	
Frt	1.00	0.95					1.00	0.98		1.00	0.97	
Flt Protected	0.95	1.00					0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1761					1770	1821		1770	1814	
Flt Permitted	0.95	1.00					0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1761					1770	1821		1770	1814	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	228	130	0	0	0	217	370	65	65	304	65
RTOR Reduction (vph)	0	26	0	0	0	0	0	7	0	0	10	0
Lane Group Flow (vph)	11	332	0	0	0	0	217	428	0	65	359	0
Turn Type	Perm						Prot			Prot		
Protected Phases		8					1	6		5	2	
Permitted Phases	8											
Actuated Green, G (s)	29.6	29.6					10.0	30.8		7.2	28.0	
Effective Green, g (s)	29.6	29.6					10.0	30.8		7.2	28.0	
Actuated g/C Ratio	0.37	0.37					0.12	0.39		0.09	0.35	
Clearance Time (s)	4.2	4.2					4.0	4.2		4.0	4.2	
Vehicle Extension (s)	3.0	3.0					3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	655	652					221	701		159	635	
v/s Ratio Prot		c0.19					c0.12	c0.23		0.04	0.20	
v/s Ratio Perm	0.01											
v/c Ratio	0.02	0.51					0.98	0.61		0.41	0.57	
Uniform Delay, d1	16.0	19.6					34.9	19.8		34.4	21.1	
Progression Factor	1.30	1.49					1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	2.4					55.1	1.6		1.7	1.2	
Delay (s)	20.8	31.7					90.0	21.3		36.1	22.2	
Level of Service	C	C					F	C		D	C	
Approach Delay (s)		31.3			0.0			44.2			24.3	
Approach LOS		C			A			D			C	

Intersection Summary			
HCM Average Control Delay	35.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.4
Intersection Capacity Utilization	62.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	320	960	300	210	470	10	120	230	60	10	250	230
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	1.00		1.00	0.97		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3413		1770	3528		1770	1805		1770	1729	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3413		1770	3528		1770	1805		1770	1729	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	348	1043	326	228	511	11	130	250	65	11	272	250
RTOR Reduction (vph)	0	35	0	0	2	0	0	9	0	0	35	0
Lane Group Flow (vph)	348	1334	0	228	520	0	130	306	0	11	487	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	19.5	30.8		10.0	21.3		7.0	31.8		1.4	26.2	
Effective Green, g (s)	19.5	30.8		10.0	21.3		7.0	31.8		1.4	26.2	
Actuated g/C Ratio	0.22	0.34		0.11	0.24		0.08	0.35		0.02	0.29	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	384	1168		197	835		138	638		28	503	
v/s Ratio Prot	0.20	c0.39		c0.13	0.15		c0.07	0.17		0.01	c0.28	
v/s Ratio Perm												
v/c Ratio	0.91	1.14		1.16	0.62		0.94	0.48		0.39	0.97	
Uniform Delay, d1	34.4	29.6		40.0	30.8		41.3	22.7		43.9	31.5	
Progression Factor	1.00	1.00		1.32	0.65		1.11	0.69		1.00	1.00	
Incremental Delay, d2	24.2	74.6		110.3	3.2		55.4	0.5		8.9	31.8	
Delay (s)	58.6	104.2		162.9	23.3		101.4	16.2		52.7	63.3	
Level of Service	E	F		F	C		F	B		D	E	
Approach Delay (s)		95.0			65.8			41.1			63.1	
Approach LOS		F			E			D			E	

Intersection Summary			
HCM Average Control Delay	76.7	HCM Level of Service	E
HCM Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	95.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	890	30	10	690	20	110	30	10	20	60	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	1.00		1.00	1.00			0.99			0.98	
Flt Protected	0.95	1.00		0.95	1.00			0.96			0.99	
Satd. Flow (prot)	1770	3522		1770	3524			1781			1814	
Flt Permitted	0.27	1.00		0.18	1.00			0.74			0.93	
Satd. Flow (perm)	510	3522		333	3524			1373			1709	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	967	33	11	750	22	120	33	11	22	65	11
RTOR Reduction (vph)	0	3	0	0	2	0	0	3	0	0	5	0
Lane Group Flow (vph)	11	997	0	11	770	0	0	161	0	0	93	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	42.0	42.0		42.0	42.0			40.0			40.0	
Effective Green, g (s)	42.0	42.0		42.0	42.0			40.0			40.0	
Actuated g/C Ratio	0.47	0.47		0.47	0.47			0.44			0.44	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	238	1644		155	1645			610			760	
v/s Ratio Prot		c0.28			0.22							
v/s Ratio Perm	0.02			0.03				c0.12			0.05	
v/c Ratio	0.05	0.61		0.07	0.47			0.26			0.12	
Uniform Delay, d1	13.1	17.9		13.2	16.4			15.7			14.7	
Progression Factor	1.67	1.47		0.68	0.63			0.62			1.00	
Incremental Delay, d2	0.1	0.4		0.5	0.6			1.0			0.3	
Delay (s)	22.0	26.6		9.5	10.9			10.7			15.0	
Level of Service	C	C		A	B			B			B	
Approach Delay (s)		26.6			10.9			10.7			15.0	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM Average Control Delay	18.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	47.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	130	710	100	120	530	240	100	420	210	150	290	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.2		4.1	4.2		4.1	4.2		4.1	4.2	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.95		1.00	0.95		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3474		1770	3374		1770	1770		1770	1815	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3474		1770	3374		1770	1770		1770	1815	
Peak-hour factor, PHF	0.96	0.96	0.96	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	135	740	104	130	576	261	109	457	228	163	315	65
RTOR Reduction (vph)	0	13	0	0	59	0	0	20	0	0	8	0
Lane Group Flow (vph)	135	831	0	130	778	0	109	665	0	163	372	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	6.9	23.2		6.9	23.2		7.4	34.4		8.9	35.9	
Effective Green, g (s)	6.9	23.2		6.9	23.2		7.4	34.4		8.9	35.9	
Actuated g/C Ratio	0.08	0.26		0.08	0.26		0.08	0.38		0.10	0.40	
Clearance Time (s)	4.1	4.2		4.1	4.2		4.1	4.2		4.1	4.2	
Vehicle Extension (s)	3.0	5.0		3.0	5.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	136	896		136	870		146	677		175	724	
v/s Ratio Prot	c0.08	c0.24		0.07	0.23		0.06	c0.38		c0.09	0.21	
v/s Ratio Perm												
v/c Ratio	0.99	0.93		0.96	0.89		0.75	0.98		0.93	0.51	
Uniform Delay, d1	41.5	32.6		41.4	32.2		40.4	27.5		40.2	20.5	
Progression Factor	1.40	0.70		1.00	1.00		1.20	0.71		1.00	1.00	
Incremental Delay, d2	66.9	14.5		63.1	13.6		11.2	22.3		48.3	2.6	
Delay (s)	124.9	37.2		104.5	45.9		59.7	41.7		88.6	23.1	
Level of Service	F	D		F	D		E	D		F	C	
Approach Delay (s)		49.3			53.8			44.2			42.7	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM Average Control Delay	48.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.6
Intersection Capacity Utilization	86.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	460	110	60	370	260	70	360	50	110	280	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2		4.2	4.2		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.94		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3436		1770	3320		1770	1829		1770	1863	1583
Flt Permitted	0.28	1.00		0.32	1.00		0.52	1.00		0.40	1.00	1.00
Satd. Flow (perm)	527	3436		598	3320		971	1829		743	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	500	120	65	402	283	76	391	54	120	304	98
RTOR Reduction (vph)	0	23	0	0	142	0	0	5	0	0	0	47
Lane Group Flow (vph)	43	597	0	65	543	0	76	440	0	120	304	51
Turn Type	Perm			Perm			Perm			Perm		Perm
Protected Phases		8			4			6			2	
Permitted Phases	8			4			6			2		2
Actuated Green, G (s)	34.8	34.8		34.8	34.8		46.5	46.5		46.5	46.5	46.5
Effective Green, g (s)	34.8	34.8		34.8	34.8		46.5	46.5		46.5	46.5	46.5
Actuated g/C Ratio	0.39	0.39		0.39	0.39		0.52	0.52		0.52	0.52	0.52
Clearance Time (s)	4.2	4.2		4.2	4.2		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	204	1329		231	1284		502	945		384	963	818
v/s Ratio Prot		c0.17			0.16			c0.24			0.16	
v/s Ratio Perm	0.08			0.11			0.08			0.16		0.03
v/c Ratio	0.21	0.45		0.28	0.42		0.15	0.47		0.31	0.32	0.06
Uniform Delay, d1	18.4	20.5		19.0	20.2		11.4	13.8		12.5	12.6	10.9
Progression Factor	1.00	1.00		0.53	0.29		1.00	1.00		1.34	1.32	2.18
Incremental Delay, d2	2.3	1.1		2.7	0.9		0.6	1.6		0.2	0.1	0.0
Delay (s)	20.8	21.6		12.8	6.7		12.0	15.5		16.9	16.7	23.7
Level of Service	C	C		B	A		B	B		B	B	C
Approach Delay (s)		21.5			7.2			15.0			18.1	
Approach LOS		C			A			B			B	

Intersection Summary			
HCM Average Control Delay	15.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.7
Intersection Capacity Utilization	97.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	630	10	10	750	30	60	60	10	10	20	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	1.00		1.00	0.99			0.99			0.91	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.99	
Satd. Flow (prot)	1770	3531		1770	3519			1802			1679	
Flt Permitted	0.24	1.00		0.31	1.00			0.84			0.98	
Satd. Flow (perm)	446	3531		579	3519			1551			1647	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	685	11	11	815	33	65	65	11	11	22	76
RTOR Reduction (vph)	0	1	0	0	3	0	0	3	0	0	42	0
Lane Group Flow (vph)	54	695	0	11	845	0	0	138	0	0	67	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	42.0	42.0		42.0	42.0			40.0			40.0	
Effective Green, g (s)	42.0	42.0		42.0	42.0			40.0			40.0	
Actuated g/C Ratio	0.47	0.47		0.47	0.47			0.44			0.44	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	208	1648		270	1642			689			732	
v/s Ratio Prot		0.20			c0.24							
v/s Ratio Perm	0.12			0.02				c0.09			0.04	
v/c Ratio	0.26	0.42		0.04	0.51			0.20			0.09	
Uniform Delay, d1	14.6	15.9		13.0	16.8			15.2			14.5	
Progression Factor	0.68	0.69		0.59	0.95			1.00			0.43	
Incremental Delay, d2	2.8	0.7		0.2	0.8			0.7			0.2	
Delay (s)	12.8	11.7		7.9	16.8			15.9			6.4	
Level of Service	B	B		A	B			B			A	
Approach Delay (s)		11.8			16.7			15.9			6.4	
Approach LOS		B			B			B			A	

Intersection Summary			
HCM Average Control Delay	14.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	48.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	80	540	30	50	640	190	90	420	70	170	340	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.2		4.0	4.2		4.0	4.2		4.0	4.2	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.97		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3511		1770	3418		1770	1823		1770	1821	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3511		1770	3418		1770	1823		1770	1821	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.96	0.96	0.96
Adj. Flow (vph)	87	587	33	54	696	207	98	457	76	177	354	62
RTOR Reduction (vph)	0	5	0	0	31	0	0	7	0	0	7	0
Lane Group Flow (vph)	87	615	0	54	872	0	98	526	0	177	409	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	4.8	31.3		4.8	31.3		7.9	28.5		9.0	29.6	
Effective Green, g (s)	4.8	31.3		4.8	31.3		7.9	28.5		9.0	29.6	
Actuated g/C Ratio	0.05	0.35		0.05	0.35		0.09	0.32		0.10	0.33	
Clearance Time (s)	4.0	4.2		4.0	4.2		4.0	4.2		4.0	4.2	
Vehicle Extension (s)	2.0	5.0		2.0	5.0		2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	94	1221		94	1189		155	577		177	599	
v/s Ratio Prot	c0.05	0.18		0.03	c0.26		0.06	c0.29		c0.10	0.22	
v/s Ratio Perm												
v/c Ratio	0.93	0.50		0.57	0.73		0.63	0.91		1.00	0.68	
Uniform Delay, d1	42.4	23.2		41.6	25.7		39.6	29.5		40.5	26.1	
Progression Factor	0.77	1.62		1.00	1.00		1.00	1.00		0.82	0.92	
Incremental Delay, d2	64.5	1.4		5.2	4.0		6.0	19.6		59.0	3.2	
Delay (s)	97.2	38.9		46.8	29.7		45.7	49.2		92.4	27.3	
Level of Service	F	D		D	C		D	D		F	C	
Approach Delay (s)		46.1			30.7			48.6			46.7	
Approach LOS		D			C			D			D	

Intersection Summary			
HCM Average Control Delay	41.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.4
Intersection Capacity Utilization	77.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	20	0	340	0	340	90	100	220	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.2	4.2		4.2	4.2	4.0	4.2	
Lane Util. Factor					1.00	1.00		1.00	1.00	1.00	1.00	
Frt					1.00	0.85		1.00	0.85	1.00	1.00	
Flt Protected					0.95	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)					1770	1583		1863	1583	1770	1863	
Flt Permitted					0.95	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)					1770	1583		1863	1583	1770	1863	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	22	0	370	0	370	98	109	239	0
RTOR Reduction (vph)	0	0	0	0	0	206	0	0	67	0	0	0
Lane Group Flow (vph)	0	0	0	0	22	164	0	370	31	109	239	0
Turn Type				Split		Perm	Perm		Perm	Prot		
Protected Phases				4	4			6		5	2	
Permitted Phases						4	6		6			
Actuated Green, G (s)					30.7	30.7		19.7	19.7	6.6	30.3	
Effective Green, g (s)					30.7	30.7		19.7	19.7	6.6	30.3	
Actuated g/C Ratio					0.44	0.44		0.28	0.28	0.10	0.44	
Clearance Time (s)					4.2	4.2		4.2	4.2	4.0	4.2	
Vehicle Extension (s)					3.0	3.0		4.8	4.8	3.0	4.8	
Lane Grp Cap (vph)					783	700		529	449	168	813	
v/s Ratio Prot					0.01			c0.20		c0.06	0.13	
v/s Ratio Perm						c0.10			0.02			
v/c Ratio					0.03	0.23		0.70	0.07	0.65	0.29	
Uniform Delay, d1					10.9	12.0		22.2	18.2	30.3	12.6	
Progression Factor					1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2					0.1	0.8		4.9	0.1	8.3	0.4	
Delay (s)					11.0	12.8		27.1	18.3	38.6	13.0	
Level of Service					B	B		C	B	D	B	
Approach Delay (s)		0.0			12.7			25.3			21.0	
Approach LOS		A			B			C			C	

Intersection Summary			
HCM Average Control Delay	20.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	69.4	Sum of lost time (s)	12.4
Intersection Capacity Utilization	45.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	180	10	10	70	10	10	30	20	10	10	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.2	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frt	1.00	0.99		1.00	0.98		1.00	0.94			0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.98	
Satd. Flow (prot)	1770	1831		1770	1825		1641	1757			1750	
Flt Permitted	0.70	1.00		0.63	1.00		0.74	1.00			0.94	
Satd. Flow (perm)	1312	1831		1170	1825		1271	1757			1674	
Peak-hour factor, PHF	0.92	0.92	0.92	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92
Adj. Flow (vph)	43	196	11	10	70	11	10	33	20	11	11	11
RTOR Reduction (vph)	0	4	0	0	6	0	0	13	0	0	7	0
Lane Group Flow (vph)	43	204	0	10	76	0	10	40	0	0	26	0
Heavy Vehicles (%)	2%	3%	2%	2%	2%	2%	10%	2%	2%	2%	2%	2%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		8			4			2			6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	30.0	30.0		30.0	30.0		22.0	22.0			21.8	
Effective Green, g (s)	30.0	30.0		30.0	30.0		22.0	22.0			21.8	
Actuated g/C Ratio	0.50	0.50		0.50	0.50		0.37	0.37			0.36	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.2	
Lane Grp Cap (vph)	656	916		585	913		466	644			608	
v/s Ratio Prot		c0.11			0.04			c0.02				
v/s Ratio Perm	0.03			0.01			0.01				0.02	
v/c Ratio	0.07	0.22		0.02	0.08		0.02	0.06			0.04	
Uniform Delay, d1	7.8	8.4		7.6	7.8		12.1	12.3			12.4	
Progression Factor	1.00	1.00		0.83	0.80		1.00	1.00			1.00	
Incremental Delay, d2	0.2	0.6		0.1	0.2		0.1	0.2			0.1	
Delay (s)	7.9	9.0		6.3	6.4		12.2	12.5			12.5	
Level of Service	A	A		A	A		B	B			B	
Approach Delay (s)		8.8			6.4			12.5			12.5	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM Average Control Delay	9.1	HCM Level of Service	A
HCM Volume to Capacity ratio	0.15		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	47.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	80	60	10	80	100	110	460	60	20	320	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2		4.2	4.2		4.2	4.2		4.2	4.2	4.2
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.94		1.00	0.92		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1743		1770	1707		1770	1831		1770	1863	1583
Flt Permitted	0.62	1.00		0.66	1.00		0.49	1.00		0.29	1.00	1.00
Satd. Flow (perm)	1164	1743		1230	1707		912	1831		548	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	65	87	65	11	87	109	120	500	65	22	348	22
RTOR Reduction (vph)	0	40	0	0	68	0	0	8	0	0	0	11
Lane Group Flow (vph)	65	112	0	11	128	0	120	557	0	22	348	11
Turn Type	Perm			Perm			Perm			Perm		Perm
Protected Phases		8			4			6			2	
Permitted Phases	8			4			6			2		2
Actuated Green, G (s)	22.8	22.8		22.8	22.8		28.8	28.8		28.8	28.8	28.8
Effective Green, g (s)	22.8	22.8		22.8	22.8		28.8	28.8		28.8	28.8	28.8
Actuated g/C Ratio	0.38	0.38		0.38	0.38		0.48	0.48		0.48	0.48	0.48
Clearance Time (s)	4.2	4.2		4.2	4.2		4.2	4.2		4.2	4.2	4.2
Lane Grp Cap (vph)	442	662		467	649		438	879		263	894	760
v/s Ratio Prot		0.06			c0.08			c0.30			0.19	
v/s Ratio Perm	0.06			0.01			0.13			0.04		0.01
v/c Ratio	0.15	0.17		0.02	0.20		0.27	0.63		0.08	0.39	0.01
Uniform Delay, d1	12.2	12.3		11.6	12.5		9.3	11.7		8.5	10.0	8.2
Progression Factor	1.23	1.59		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.7	0.5		0.1	0.7		1.5	3.5		0.6	1.3	0.0
Delay (s)	15.7	20.1		11.7	13.2		10.9	15.1		9.1	11.3	8.2
Level of Service	B	C		B	B		B	B		A	B	A
Approach Delay (s)		18.8			13.1			14.4			11.0	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM Average Control Delay	14.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.4
Intersection Capacity Utilization	100.2%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	370	1040	30	10	720	110	30	10	10	70	30	110
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	402	1130	33	11	783	120	33	11	11	76	33	120
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					400							
pX, platoon unblocked	0.93						0.93	0.93		0.93	0.93	0.93
vC, conflicting volume	902			1163			2500	2875	582	2250	2832	451
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	742			1163			2462	2865	582	2193	2819	256
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	50			98			0	0	98	0	0	83
cM capacity (veh/h)	800			596			0	7	457	0	8	690

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	402	754	409	11	522	380	54	228
Volume Left	402	0	0	11	0	0	33	76
Volume Right	0	0	33	0	0	120	11	120
cSH	800	1700	1700	596	1700	1700	0	0
Volume to Capacity	0.50	0.44	0.24	0.02	0.31	0.22	Err	Err
Queue Length 95th (ft)	72	0	0	1	0	0	Err	Err
Control Delay (s)	14.0	0.0	0.0	11.1	0.0	0.0	Err	Err
Lane LOS	B			B			F	F
Approach Delay (s)	3.6			0.1			Err	Err
Approach LOS							F	F

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	66.7%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	800	270	40	610	110	170	160	20	20	20	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.2		4.0	4.2		5.6	5.6		5.6	5.6	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.98		1.00	0.98		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3405		1770	3458		1770	1831		1770	1770	
Flt Permitted	0.95	1.00		0.95	1.00		0.74	1.00		0.51	1.00	
Satd. Flow (perm)	1770	3405		1770	3458		1370	1831		951	1770	
Peak-hour factor, PHF	0.92	0.92	0.92	0.95	0.95	0.95	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	870	293	42	642	116	185	174	22	22	22	11
RTOR Reduction (vph)	0	29	0	0	12	0	0	6	0	0	9	0
Lane Group Flow (vph)	11	1134	0	42	746	0	185	190	0	22	24	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	1.6	54.2		5.0	57.6		17.0	17.0		17.0	17.0	
Effective Green, g (s)	1.6	54.2		5.0	57.6		17.0	17.0		17.0	17.0	
Actuated g/C Ratio	0.02	0.60		0.06	0.64		0.19	0.19		0.19	0.19	
Clearance Time (s)	4.0	4.2		4.0	4.2		5.6	5.6		5.6	5.6	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	31	2051		98	2213		259	346		180	334	
v/s Ratio Prot	0.01	c0.33		0.02	c0.22			0.10			0.01	
v/s Ratio Perm							c0.14			0.02		
v/c Ratio	0.35	0.55		0.43	0.34		0.71	0.55		0.12	0.07	
Uniform Delay, d1	43.7	10.7		41.1	7.4		34.2	33.0		30.3	30.0	
Progression Factor	1.00	1.00		0.79	1.53		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.5	1.1		0.9	0.3		7.5	1.1		0.1	0.0	
Delay (s)	46.2	11.8		33.2	11.7		41.8	34.1		30.4	30.0	
Level of Service	D	B		C	B		D	C		C	C	
Approach Delay (s)		12.1			12.8			37.8			30.2	
Approach LOS		B			B			D			C	

Intersection Summary			
HCM Average Control Delay	16.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	58.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	620	50	50	520	170	280	470	140	180	220	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.2		4.0	4.2		4.2	4.2	4.2	4.2	4.2	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	0.96		1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3500		1770	3408		1770	1863	1583	1770	1820	
Flt Permitted	0.95	1.00		0.95	1.00		0.49	1.00	1.00	0.25	1.00	
Satd. Flow (perm)	1770	3500		1770	3408		914	1863	1583	458	1820	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	65	674	54	54	565	185	304	511	152	196	239	43
RTOR Reduction (vph)	0	6	0	0	30	0	0	0	41	0	8	0
Lane Group Flow (vph)	65	722	0	54	720	0	304	511	111	196	274	0
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	6.4	37.0		4.8	35.4		35.8	35.8	35.8	35.8	35.8	
Effective Green, g (s)	6.4	37.0		4.8	35.4		35.8	35.8	35.8	35.8	35.8	
Actuated g/C Ratio	0.07	0.41		0.05	0.39		0.40	0.40	0.40	0.40	0.40	
Clearance Time (s)	4.0	4.2		4.0	4.2		4.2	4.2	4.2	4.2	4.2	
Vehicle Extension (s)	2.0	4.8		2.0	4.8		4.8	4.8	4.8	4.8	4.8	
Lane Grp Cap (vph)	126	1439		94	1340		364	741	630	182	724	
v/s Ratio Prot	c0.04	0.21		0.03	c0.21			0.27			0.15	
v/s Ratio Perm							0.33		0.07	c0.43		
v/c Ratio	0.52	0.50		0.57	0.54		0.84	0.69	0.18	1.08	0.38	
Uniform Delay, d1	40.3	19.7		41.6	21.0		24.4	22.5	17.6	27.1	19.2	
Progression Factor	0.87	0.57		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.3	1.1		5.2	1.5		16.6	3.3	0.3	88.7	0.6	
Delay (s)	36.2	12.2		46.8	22.5		41.0	25.8	17.8	115.8	19.9	
Level of Service	D	B		D	C		D	C	B	F	B	
Approach Delay (s)		14.2			24.2			29.3			59.2	
Approach LOS		B			C			C			E	

Intersection Summary			
HCM Average Control Delay	28.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.4
Intersection Capacity Utilization	73.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	150	470	10	40	560	80	120	500	20	50	340	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.2		4.0	4.2		4.2	4.2			4.2	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frt	1.00	1.00		1.00	0.98		1.00	0.99			1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1770	1857		1770	1828		1770	1852			1845	
Flt Permitted	0.95	1.00		0.95	1.00		0.39	1.00			0.59	
Satd. Flow (perm)	1770	1857		1770	1828		729	1852			1091	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.93	0.93	0.93	0.92	0.92	0.92
Adj. Flow (vph)	163	511	11	43	609	87	129	538	22	54	370	11
RTOR Reduction (vph)	0	1	0	0	6	0	0	2	0	0	1	0
Lane Group Flow (vph)	163	521	0	43	690	0	129	558	0	0	434	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			6			2	
Permitted Phases							6			2		
Actuated Green, G (s)	8.0	40.0		2.4	34.4		35.2	35.2			35.2	
Effective Green, g (s)	8.0	40.0		2.4	34.4		35.2	35.2			35.2	
Actuated g/C Ratio	0.09	0.44		0.03	0.38		0.39	0.39			0.39	
Clearance Time (s)	4.0	4.2		4.0	4.2		4.2	4.2			4.2	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	157	825		47	699		285	724			427	
v/s Ratio Prot	c0.09	0.28		0.02	c0.38			0.30				
v/s Ratio Perm							0.18				c0.40	
v/c Ratio	1.04	0.63		0.91	0.99		0.45	0.77			1.02	
Uniform Delay, d1	41.0	19.3		43.7	27.6		20.3	23.9			27.4	
Progression Factor	1.18	0.75		1.00	1.00		1.34	1.22			1.00	
Incremental Delay, d2	80.3	3.5		98.6	31.2		2.8	4.4			47.6	
Delay (s)	128.5	18.0		142.3	58.8		30.0	33.4			75.0	
Level of Service	F	B		F	E		C	C			E	
Approach Delay (s)		44.3			63.6			32.8			75.0	
Approach LOS		D			E			C			E	

Intersection Summary			
HCM Average Control Delay	52.0	HCM Level of Service	D
HCM Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.4
Intersection Capacity Utilization	107.3%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	450	20	30	560	60	50	360	40	10	160	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		5.4	5.4		5.4	5.4		5.4	5.4	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.99		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1851		1770	1790		1770	1835		1770	1779	
Flt Permitted	0.32	1.00		0.38	1.00		0.53	1.00		0.23	1.00	
Satd. Flow (perm)	589	1851		712	1790		984	1835		424	1779	
Peak-hour factor, PHF	0.92	0.92	0.92	1.00	1.00	1.00	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	489	22	30	560	60	54	391	43	11	174	54
RTOR Reduction (vph)	0	2	0	0	4	0	0	5	0	0	13	0
Lane Group Flow (vph)	22	509	0	30	616	0	54	429	0	11	215	0
Heavy Vehicles (%)	2%	2%	2%	2%	4%	10%	2%	2%	2%	2%	3%	3%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			2	
Permitted Phases	4			8			2			2		
Actuated Green, G (s)	54.0	54.0		52.6	52.6		26.6	26.6		26.6	26.6	
Effective Green, g (s)	54.0	54.0		52.6	52.6		26.6	26.6		26.6	26.6	
Actuated g/C Ratio	0.60	0.60		0.58	0.58		0.30	0.30		0.30	0.30	
Clearance Time (s)	4.0	4.0		5.4	5.4		5.4	5.4		5.4	5.4	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	353	1111		416	1046		291	542		125	526	
v/s Ratio Prot		0.28			c0.34			c0.23			0.12	
v/s Ratio Perm	0.04			0.04			0.05			0.03		
v/c Ratio	0.06	0.46		0.07	0.59		0.19	0.79		0.09	0.41	
Uniform Delay, d1	7.5	9.9		8.1	11.9		23.6	29.2		22.9	25.4	
Progression Factor	0.84	0.83		1.05	0.80		0.96	0.88		1.00	1.00	
Incremental Delay, d2	0.2	0.9		0.1	1.0		0.3	7.1		0.3	0.5	
Delay (s)	6.5	9.1		8.6	10.5		23.0	32.8		23.2	25.9	
Level of Service	A	A		A	B		C	C		C	C	
Approach Delay (s)		9.0			10.4			31.8			25.8	
Approach LOS		A			B			C			C	

Intersection Summary			
HCM Average Control Delay	17.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.8
Intersection Capacity Utilization	83.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	260	320	80	220	490	40	130	320	280	10	80	360
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.2	4.2	4.5	4.2	4.2	4.2	4.5		4.5	4.2	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93		1.00	0.88	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1732		1770	1634	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583	1770	1732		1770	1634	
Peak-hour factor, PHF	0.92	0.92	0.92	0.96	0.96	0.96	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	283	348	87	229	510	42	141	348	304	11	87	391
RTOR Reduction (vph)	0	0	59	0	0	13	0	35	0	0	186	0
Lane Group Flow (vph)	283	348	28	229	510	29	141	617	0	11	292	0
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		2	5		6	1	
Permitted Phases			4			8						
Actuated Green, G (s)	4.0	28.9	28.9	4.0	28.9	28.9	21.5	32.7		6.7	18.5	
Effective Green, g (s)	4.0	28.9	28.9	4.0	28.9	28.9	21.5	32.7		6.7	18.5	
Actuated g/C Ratio	0.04	0.32	0.32	0.04	0.32	0.32	0.24	0.36		0.07	0.21	
Clearance Time (s)	4.5	4.2	4.2	4.5	4.2	4.2	4.2	4.5		4.5	4.2	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	79	598	508	79	598	508	423	629		132	336	
v/s Ratio Prot	c0.16	0.19		0.13	c0.27		c0.08	c0.36		0.01	0.18	
v/s Ratio Perm			0.02			0.02						
v/c Ratio	3.58	0.58	0.05	2.90	0.85	0.06	0.33	0.98		0.08	0.87	
Uniform Delay, d1	43.0	25.5	21.1	43.0	28.6	21.1	28.3	28.3		38.8	34.6	
Progression Factor	1.00	1.00	1.00	1.08	0.86	0.82	0.59	0.88		1.00	1.00	
Incremental Delay, d2	1192.8	4.1	0.2	884.8	13.2	0.2	0.2	7.0		1.2	20.5	
Delay (s)	1235.8	29.6	21.3	931.0	37.6	17.5	16.8	32.1		40.0	55.1	
Level of Service	F	C	C	F	D	B	B	C		D	E	
Approach Delay (s)		504.0			298.5			29.4			54.7	
Approach LOS		F			F			C			D	

Intersection Summary			
HCM Average Control Delay	232.0	HCM Level of Service	F
HCM Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.2
Intersection Capacity Utilization	92.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	130	100	70	100	30	70	580	240	170	220	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2	4.2	4.2	4.2			4.2	4.2	4.6	4.6	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.97			1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.99	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1798			1853	1583	1770	1839	
Flt Permitted	0.61	1.00	1.00	0.63	1.00			0.17	1.00	0.40	1.00	
Satd. Flow (perm)	1138	1863	1583	1165	1798			322	1583	739	1839	
Peak-hour factor, PHF	0.96	0.96	0.96	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	31	135	104	76	109	33	76	630	261	185	239	22
RTOR Reduction (vph)	0	0	80	0	12	0	0	0	74	0	3	0
Lane Group Flow (vph)	31	135	24	76	130	0	0	706	187	185	258	0
Turn Type	Perm		Perm	Perm			Perm		Perm	Perm		
Protected Phases		4			8			1			2	
Permitted Phases	4		4	8			1		1	2		
Actuated Green, G (s)	20.8	20.8	20.8	20.8	20.8			40.8	40.8	15.4	15.4	
Effective Green, g (s)	20.8	20.8	20.8	20.8	20.8			40.8	40.8	15.4	15.4	
Actuated g/C Ratio	0.23	0.23	0.23	0.23	0.23			0.45	0.45	0.17	0.17	
Clearance Time (s)	4.2	4.2	4.2	4.2	4.2			4.2	4.2	4.6	4.6	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0			2.0	2.0	3.8	3.8	
Lane Grp Cap (vph)	263	431	366	269	416			146	718	126	315	
v/s Ratio Prot		c0.07			0.07						0.14	
v/s Ratio Perm	0.03		0.02	0.07				c2.19	0.12	c0.25		
v/c Ratio	0.12	0.31	0.07	0.28	0.31			4.84	0.26	1.47	0.82	
Uniform Delay, d1	27.3	28.7	27.0	28.5	28.7			24.6	15.3	37.3	35.9	
Progression Factor	1.00	1.00	1.00	1.02	1.05			1.00	1.00	1.17	1.11	
Incremental Delay, d2	0.9	1.9	0.3	2.6	1.9			1741.4	0.1	214.7	2.3	
Delay (s)	28.3	30.6	27.4	31.7	31.9			1766.0	15.3	258.2	42.3	
Level of Service	C	C	C	C	C			F	B	F	D	
Approach Delay (s)		29.1			31.8			1293.5			131.9	
Approach LOS		C			C			F			F	

Intersection Summary			
HCM Average Control Delay	696.7	HCM Level of Service	F
HCM Volume to Capacity ratio	2.94		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	93.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	130	420	10	10	60	110	30	240	10	140	20	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.2		4.2	4.2			4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.90			1.00		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00			0.99		0.95	1.00	
Satd. Flow (prot)	1770	1839		1770	1682			1844		1719	1658	
Flt Permitted	0.95	1.00		0.49	1.00			0.96		0.35	1.00	
Satd. Flow (perm)	1770	1839		921	1682			1785		629	1658	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	1.00	0.92	1.00
Adj. Flow (vph)	141	457	11	11	65	120	33	261	11	140	22	60
RTOR Reduction (vph)	0	1	0	0	61	0	0	2	0	0	45	0
Lane Group Flow (vph)	141	467	0	11	124	0	0	303	0	140	37	0
Heavy Vehicles (%)	2%	3%	2%	2%	2%	2%	2%	2%	2%	5%	2%	2%
Turn Type	Prot			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases				8			2			6		
Actuated Green, G (s)	12.2	60.0		43.8	43.8			21.8		21.8	21.8	
Effective Green, g (s)	12.2	60.0		43.8	43.8			21.8		21.8	21.8	
Actuated g/C Ratio	0.14	0.67		0.49	0.49			0.24		0.24	0.24	
Clearance Time (s)	4.0	4.2		4.2	4.2			4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	240	1226		448	819			432		152	402	
v/s Ratio Prot	c0.08	c0.25			0.07						0.02	
v/s Ratio Perm				0.01				0.17		c0.22		
v/c Ratio	0.59	0.38		0.02	0.15			0.70		0.92	0.09	
Uniform Delay, d1	36.5	6.7		12.0	12.8			31.1		33.3	26.4	
Progression Factor	1.16	0.69		1.90	3.79			1.57		0.66	0.21	
Incremental Delay, d2	2.8	0.7		0.1	0.3			4.4		48.8	0.1	
Delay (s)	45.1	5.3		22.9	48.8			53.3		70.8	5.6	
Level of Service	D	A		C	D			D		E	A	
Approach Delay (s)		14.5			47.3			53.3			46.8	
Approach LOS		B			D			D			D	

Intersection Summary			
HCM Average Control Delay	33.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	62.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	540	50	0	0	0	140	550	50	120	200	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2					4.0	4.2		4.0	4.2	
Lane Util. Factor	1.00	1.00					1.00	1.00		1.00	1.00	
Frt	1.00	0.99					1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00					0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1839					1770	1840		1770	1817	
Flt Permitted	0.95	1.00					0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1839					1770	1840		1770	1817	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	587	54	0	0	0	152	598	54	130	217	43
RTOR Reduction (vph)	0	4	0	0	0	0	0	4	0	0	8	0
Lane Group Flow (vph)	54	637	0	0	0	0	152	648	0	130	252	0
Turn Type	Perm						Prot			Prot		
Protected Phases		8					1	6		5	2	
Permitted Phases	8											
Actuated Green, G (s)	37.4	37.4					10.5	33.2		7.0	29.7	
Effective Green, g (s)	37.4	37.4					10.5	33.2		7.0	29.7	
Actuated g/C Ratio	0.42	0.42					0.12	0.37		0.08	0.33	
Clearance Time (s)	4.2	4.2					4.0	4.2		4.0	4.2	
Vehicle Extension (s)	3.0	3.0					3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	736	764					207	679		138	600	
v/s Ratio Prot		c0.35					0.09	c0.35		c0.07	0.14	
v/s Ratio Perm	0.03											
v/c Ratio	0.07	0.83					0.73	0.95		0.94	0.42	
Uniform Delay, d1	15.9	23.5					38.4	27.7		41.3	23.5	
Progression Factor	0.91	0.91					0.89	1.38		1.50	0.33	
Incremental Delay, d2	0.2	9.8					5.0	12.0		28.3	0.1	
Delay (s)	14.6	31.2					39.0	50.3		90.3	7.9	
Level of Service	B	C					D	D		F	A	
Approach Delay (s)		29.9			0.0			48.1			35.4	
Approach LOS		C			A			D			D	

Intersection Summary			
HCM Average Control Delay	38.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.4
Intersection Capacity Utilization	80.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	300	750	160	100	890	20	270	280	180	10	210	360
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	1.00		1.00	0.94		1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3446		1770	3527		1770	1753		1770	1686	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3446		1770	3527		1770	1753		1770	1686	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	326	815	174	109	967	22	293	304	196	11	228	391
RTOR Reduction (vph)	0	21	0	0	2	0	0	23	0	0	65	0
Lane Group Flow (vph)	326	968	0	109	987	0	293	477	0	11	554	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	14.0	29.8		6.0	21.8		12.0	37.4		0.8	26.2	
Effective Green, g (s)	14.0	29.8		6.0	21.8		12.0	37.4		0.8	26.2	
Actuated g/C Ratio	0.16	0.33		0.07	0.24		0.13	0.42		0.01	0.29	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	275	1141		118	854		236	728		16	491	
v/s Ratio Prot	c0.18	0.28		0.06	c0.28		c0.17	0.27		0.01	c0.33	
v/s Ratio Perm												
v/c Ratio	1.19	0.85		0.92	1.16		1.24	0.66		0.69	1.13	
Uniform Delay, d1	38.0	28.0		41.8	34.1		39.0	21.1		44.5	31.9	
Progression Factor	1.00	1.00		1.11	1.19		1.06	0.79		1.00	1.00	
Incremental Delay, d2	114.1	7.9		57.4	82.9		138.2	2.0		80.1	80.6	
Delay (s)	152.1	35.9		103.9	123.5		179.6	18.7		124.6	112.5	
Level of Service	F	D		F	F		F	B		F	F	
Approach Delay (s)		64.7			121.5			78.2			112.7	
Approach LOS		E			F			E			F	

Intersection Summary			
HCM Average Control Delay	91.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.17		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	103.3%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	870	80	10	710	70	110	250	20	20	30	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	0.99		1.00	0.99			0.99			0.98	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.98	
Satd. Flow (prot)	1770	3495		1770	3492			1823			1791	
Flt Permitted	0.28	1.00		0.22	1.00			0.88			0.85	
Satd. Flow (perm)	527	3495		403	3492			1634			1555	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	946	87	11	772	76	120	272	22	22	33	11
RTOR Reduction (vph)	0	6	0	0	6	0	0	3	0	0	8	0
Lane Group Flow (vph)	11	1027	0	11	842	0	0	411	0	0	58	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	53.5	53.5		53.5	53.5			28.5			28.5	
Effective Green, g (s)	53.5	53.5		53.5	53.5			28.5			28.5	
Actuated g/C Ratio	0.59	0.59		0.59	0.59			0.32			0.32	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	313	2078		240	2076			517			492	
v/s Ratio Prot		c0.29			0.24							
v/s Ratio Perm	0.02			0.03				c0.25			0.04	
v/c Ratio	0.04	0.49		0.05	0.41			0.80			0.12	
Uniform Delay, d1	7.6	10.5		7.6	9.8			28.1			21.8	
Progression Factor	1.35	1.15		0.89	0.67			0.54			1.22	
Incremental Delay, d2	0.1	0.6		0.3	0.4			7.3			0.1	
Delay (s)	10.3	12.6		7.0	7.0			22.5			26.8	
Level of Service	B	B		A	A			C			C	
Approach Delay (s)		12.5			7.0			22.5			26.8	
Approach LOS		B			A			C			C	

Intersection Summary			
HCM Average Control Delay	12.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	58.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	130	680	80	140	520	140	130	460	100	200	220	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.2		4.1	4.2		4.1	4.2		4.1	4.2	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.97		1.00	0.97		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3484		1770	3427		1770	1813		1770	1764	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3484		1770	3427		1770	1813		1770	1764	
Peak-hour factor, PHF	0.96	0.96	0.96	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	135	708	83	152	565	152	141	500	109	217	239	130
RTOR Reduction (vph)	0	10	0	0	27	0	0	9	0	0	22	0
Lane Group Flow (vph)	135	781	0	152	690	0	141	600	0	217	347	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	8.0	24.2		8.5	24.7		10.6	29.0		11.7	30.1	
Effective Green, g (s)	8.0	24.2		8.5	24.7		10.6	29.0		11.7	30.1	
Actuated g/C Ratio	0.09	0.27		0.09	0.27		0.12	0.32		0.13	0.33	
Clearance Time (s)	4.1	4.2		4.1	4.2		4.1	4.2		4.1	4.2	
Vehicle Extension (s)	3.0	5.0		3.0	5.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	157	937		167	941		208	584		230	590	
v/s Ratio Prot	0.08	c0.22		c0.09	0.20		0.08	c0.33		c0.12	0.20	
v/s Ratio Perm												
v/c Ratio	0.86	0.83		0.91	0.73		0.68	1.03		0.94	0.59	
Uniform Delay, d1	40.4	31.0		40.4	29.7		38.1	30.5		38.8	24.8	
Progression Factor	0.67	0.97		1.00	1.00		0.86	0.79		1.15	1.12	
Incremental Delay, d2	31.6	7.7		44.5	5.1		6.5	39.7		43.1	4.2	
Delay (s)	58.5	37.7		84.9	34.7		39.4	63.9		87.8	32.1	
Level of Service	E	D		F	C		D	E		F	C	
Approach Delay (s)		40.7			43.5			59.3			52.7	
Approach LOS		D			D			E			D	

Intersection Summary			
HCM Average Control Delay	48.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	84.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	70	450	120	40	420	170	130	330	50	200	290	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2		4.2	4.2		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.96		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3428		1770	3386		1770	1826		1770	1863	1583
Flt Permitted	0.29	1.00		0.30	1.00		0.52	1.00		0.44	1.00	1.00
Satd. Flow (perm)	539	3428		566	3386		973	1826		821	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	76	489	130	43	457	185	141	359	54	217	315	54
RTOR Reduction (vph)	0	27	0	0	49	0	0	6	0	0	0	24
Lane Group Flow (vph)	76	592	0	43	594	0	141	407	0	217	315	30
Turn Type	Perm			Perm			Perm			Perm		Perm
Protected Phases		8			4			6			2	
Permitted Phases	8			4			6			2		2
Actuated Green, G (s)	31.8	31.8		31.8	31.8		49.5	49.5		49.5	49.5	49.5
Effective Green, g (s)	31.8	31.8		31.8	31.8		49.5	49.5		49.5	49.5	49.5
Actuated g/C Ratio	0.35	0.35		0.35	0.35		0.55	0.55		0.55	0.55	0.55
Clearance Time (s)	4.2	4.2		4.2	4.2		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	190	1211		200	1196		535	1004		452	1025	871
v/s Ratio Prot		0.17			c0.18			0.22			0.17	
v/s Ratio Perm	0.14			0.08			0.14			c0.26		0.02
v/c Ratio	0.40	0.49		0.21	0.50		0.26	0.41		0.48	0.31	0.03
Uniform Delay, d1	21.9	22.8		20.4	22.8		10.7	11.7		12.4	11.0	9.3
Progression Factor	1.00	1.00		1.30	1.25		1.00	1.00		1.48	1.47	2.19
Incremental Delay, d2	6.2	1.4		2.1	1.3		1.2	1.2		1.6	0.3	0.0
Delay (s)	28.1	24.2		28.6	29.8		11.9	12.9		19.9	16.5	20.4
Level of Service	C	C		C	C		B	B		B	B	C
Approach Delay (s)		24.6			29.7			12.7			18.1	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM Average Control Delay	21.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.7
Intersection Capacity Utilization	95.7%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	110	730	70	10	600	210	10	50	10	10	50	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	0.99		1.00	0.96			0.98			0.93	
Flt Protected	0.95	1.00		0.95	1.00			0.99			1.00	
Satd. Flow (prot)	1770	3493		1770	3232			1813			1730	
Flt Permitted	0.23	1.00		0.23	1.00			0.97			0.98	
Satd. Flow (perm)	421	3493		429	3232			1767			1708	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	120	793	76	11	652	228	11	54	11	11	54	65
RTOR Reduction (vph)	0	8	0	0	39	0	0	6	0	0	36	0
Lane Group Flow (vph)	120	861	0	11	841	0	0	70	0	0	94	0
Parking (#/hr)					0							
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	42.0	42.0		42.0	42.0			40.0			40.0	
Effective Green, g (s)	42.0	42.0		42.0	42.0			40.0			40.0	
Actuated g/C Ratio	0.47	0.47		0.47	0.47			0.44			0.44	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	196	1630		200	1508			785			759	
v/s Ratio Prot		0.25			0.26							
v/s Ratio Perm	c0.29			0.03				0.04			c0.05	
v/c Ratio	0.61	0.53		0.06	0.56			0.09			0.12	
Uniform Delay, d1	17.9	17.0		13.1	17.3			14.5			14.7	
Progression Factor	0.71	0.75		1.18	0.86			1.00			0.70	
Incremental Delay, d2	12.8	1.2		0.3	0.9			0.2			0.3	
Delay (s)	25.6	13.8		15.9	15.9			14.7			10.5	
Level of Service	C	B		B	B			B			B	
Approach Delay (s)		15.3			15.9			14.7			10.5	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM Average Control Delay	15.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	47.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	670	30	50	680	200	90	360	50	170	460	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.2		4.0	4.2		4.0	4.2		4.0	4.2	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.97		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3516		1770	3419		1770	1829		1770	1835	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3516		1770	3419		1770	1829		1770	1835	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.96	0.96	0.96
Adj. Flow (vph)	54	728	33	54	739	217	98	391	54	177	479	52
RTOR Reduction (vph)	0	3	0	0	29	0	0	6	0	0	5	0
Lane Group Flow (vph)	54	758	0	54	927	0	98	439	0	177	526	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	4.4	32.0		3.9	31.5		6.0	26.5		11.2	31.7	
Effective Green, g (s)	4.4	32.0		3.9	31.5		6.0	26.5		11.2	31.7	
Actuated g/C Ratio	0.05	0.36		0.04	0.35		0.07	0.29		0.12	0.35	
Clearance Time (s)	4.0	4.2		4.0	4.2		4.0	4.2		4.0	4.2	
Vehicle Extension (s)	2.0	5.0		2.0	5.0		2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	87	1250		77	1197		118	539		220	646	
v/s Ratio Prot	c0.03	0.22		0.03	c0.27		0.06	0.24		c0.10	c0.29	
v/s Ratio Perm												
v/c Ratio	0.62	0.61		0.70	0.77		0.83	0.82		0.80	0.81	
Uniform Delay, d1	42.0	23.8		42.5	26.1		41.5	29.5		38.3	26.5	
Progression Factor	1.55	0.54		1.00	1.00		1.00	1.00		1.20	0.80	
Incremental Delay, d2	8.3	1.9		20.9	4.9		35.4	10.4		16.1	7.8	
Delay (s)	73.2	14.8		63.4	31.0		76.9	39.8		62.0	29.1	
Level of Service	E	B		E	C		E	D		E	C	
Approach Delay (s)		18.7			32.7			46.5			37.3	
Approach LOS		B			C			D			D	

Intersection Summary			
HCM Average Control Delay	32.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.2
Intersection Capacity Utilization	74.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	110	0	180	0	270	40	240	260	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.2	4.2	4.0	4.2	
Lane Util. Factor					1.00	1.00		1.00	1.00	1.00	1.00	
Frt					1.00	0.85		1.00	0.85	1.00	1.00	
Flt Protected					0.95	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)					1770	1583		1863	1583	1770	1863	
Flt Permitted					0.95	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)					1770	1583		1863	1583	1770	1863	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	120	0	196	0	293	43	261	283	0
RTOR Reduction (vph)	0	0	0	0	0	159	0	0	29	0	0	0
Lane Group Flow (vph)	0	0	0	0	120	37	0	293	14	261	283	0
Turn Type				Split		Perm	Perm		Perm	Prot		
Protected Phases				4	4			6		5	2	
Permitted Phases						4	6		6			
Actuated Green, G (s)					9.8	9.8		16.4	16.4	13.5	33.9	
Effective Green, g (s)					9.8	9.8		16.4	16.4	13.5	33.9	
Actuated g/C Ratio					0.19	0.19		0.32	0.32	0.26	0.65	
Clearance Time (s)					4.0	4.0		4.2	4.2	4.0	4.2	
Vehicle Extension (s)					3.0	3.0		4.8	4.8	3.0	4.8	
Lane Grp Cap (vph)					334	299		589	500	460	1217	
v/s Ratio Prot					c0.07			c0.16		c0.15	0.15	
v/s Ratio Perm						0.02			0.01			
v/c Ratio					0.36	0.12		0.50	0.03	0.57	0.23	
Uniform Delay, d1					18.3	17.5		14.4	12.3	16.7	3.7	
Progression Factor					1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2					0.7	0.2		1.3	0.0	1.6	0.2	
Delay (s)					19.0	17.7		15.7	12.3	18.3	3.9	
Level of Service					B	B		B	B	B	A	
Approach Delay (s)		0.0			18.2			15.3			10.8	
Approach LOS		A			B			B			B	

Intersection Summary			
HCM Average Control Delay	14.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	51.9	Sum of lost time (s)	12.2
Intersection Capacity Utilization	44.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	110	10	20	260	10	10	10	20	10	70	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.2	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.90			0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1770	1823		1770	1851		1641	1682			1824	
Flt Permitted	0.57	1.00		0.67	1.00		0.77	1.00			0.98	
Satd. Flow (perm)	1055	1823		1254	1851		1334	1682			1797	
Peak-hour factor, PHF	0.92	0.92	0.92	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92
Adj. Flow (vph)	11	120	11	20	260	11	10	11	20	11	76	11
RTOR Reduction (vph)	0	6	0	0	3	0	0	13	0	0	7	0
Lane Group Flow (vph)	11	126	0	20	269	0	10	18	0	0	91	0
Heavy Vehicles (%)	2%	3%	2%	2%	2%	2%	10%	2%	2%	2%	2%	2%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		8			4			2			6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	30.0	30.0		30.0	30.0		22.0	22.0			21.8	
Effective Green, g (s)	30.0	30.0		30.0	30.0		22.0	22.0			21.8	
Actuated g/C Ratio	0.50	0.50		0.50	0.50		0.37	0.37			0.36	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.2	
Lane Grp Cap (vph)	528	912		627	926		489	617			653	
v/s Ratio Prot		0.07			c0.15			0.01				
v/s Ratio Perm	0.01			0.02			0.01				c0.05	
v/c Ratio	0.02	0.14		0.03	0.29		0.02	0.03			0.14	
Uniform Delay, d1	7.6	8.1		7.6	8.8		12.1	12.2			12.8	
Progression Factor	1.00	1.00		1.14	1.05		1.00	1.00			1.00	
Incremental Delay, d2	0.1	0.3		0.1	0.8		0.1	0.1			0.4	
Delay (s)	7.7	8.4		8.8	10.0		12.2	12.3			13.3	
Level of Service	A	A		A	A		B	B			B	
Approach Delay (s)		8.3			9.9			12.2			13.3	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM Average Control Delay	10.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.23		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.2
Intersection Capacity Utilization	47.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	120	80	140	190	90	110	330	40	110	340	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2		4.2	4.2		4.2	4.2		4.2	4.2	4.2
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.94		1.00	0.95		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1751		1770	1773		1770	1833		1770	1863	1583
Flt Permitted	0.49	1.00		0.60	1.00		0.47	1.00		0.44	1.00	1.00
Satd. Flow (perm)	911	1751		1114	1773		873	1833		817	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	130	87	152	207	98	120	359	43	120	370	54
RTOR Reduction (vph)	0	40	0	0	29	0	0	7	0	0	0	27
Lane Group Flow (vph)	54	177	0	152	276	0	120	395	0	120	370	27
Turn Type	Perm			Perm			Perm			Perm		Perm
Protected Phases		8			4			6			2	
Permitted Phases	8			4			6			2		2
Actuated Green, G (s)	22.8	22.8		22.8	22.8		28.8	28.8		28.8	28.8	28.8
Effective Green, g (s)	22.8	22.8		22.8	22.8		28.8	28.8		28.8	28.8	28.8
Actuated g/C Ratio	0.38	0.38		0.38	0.38		0.48	0.48		0.48	0.48	0.48
Clearance Time (s)	4.2	4.2		4.2	4.2		4.2	4.2		4.2	4.2	4.2
Lane Grp Cap (vph)	346	665		423	674		419	880		392	894	760
v/s Ratio Prot		0.10			c0.16			c0.22			0.20	
v/s Ratio Perm	0.06			0.14			0.14			0.15		0.02
v/c Ratio	0.16	0.27		0.36	0.41		0.29	0.45		0.31	0.41	0.04
Uniform Delay, d1	12.3	12.8		13.4	13.7		9.4	10.3		9.5	10.1	8.3
Progression Factor	0.83	0.77		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.0	1.0		2.4	1.8		1.7	1.7		2.0	1.4	0.1
Delay (s)	11.1	10.9		15.7	15.5		11.1	12.0		11.5	11.5	8.3
Level of Service	B	B		B	B		B	B		B	B	A
Approach Delay (s)		10.9			15.6			11.8			11.2	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM Average Control Delay	12.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.4
Intersection Capacity Utilization	94.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	200	990	30	10	1170	120	40	20	10	70	20	330
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	217	1076	33	11	1272	130	43	22	11	76	22	359
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					400							
pX, platoon unblocked	0.79						0.79	0.79		0.79	0.79	0.79
vC, conflicting volume	1402			1109			2554	2951	554	2353	2902	701
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	976			1109			2435	2938	554	2181	2876	88
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	61			98			0	0	98	0	0	52
cM capacity (veh/h)	555			626			0	7	476	0	8	752

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	217	717	391	11	848	554	76	457
Volume Left	217	0	0	11	0	0	43	76
Volume Right	0	0	33	0	0	130	11	359
cSH	555	1700	1700	626	1700	1700	0	0
Volume to Capacity	0.39	0.42	0.23	0.02	0.50	0.33	Err	Err
Queue Length 95th (ft)	46	0	0	1	0	0	Err	Err
Control Delay (s)	15.6	0.0	0.0	10.9	0.0	0.0	Err	Err
Lane LOS	C			B			F	F
Approach Delay (s)	2.6			0.1			Err	Err
Approach LOS							F	F

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	82.6%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	690	320	40	1050	20	230	20	20	150	130	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.2		4.0	4.2		5.6	5.6		5.6	5.6	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	1.00		1.00	0.93		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3371		1770	3529		1770	1723		1770	1825	
Flt Permitted	0.95	1.00		0.95	1.00		0.62	1.00		0.73	1.00	
Satd. Flow (perm)	1770	3371		1770	3529		1160	1723		1357	1825	
Peak-hour factor, PHF	0.92	0.92	0.92	0.95	0.95	0.95	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	750	348	42	1105	21	250	22	22	163	141	22
RTOR Reduction (vph)	0	47	0	0	1	0	0	16	0	0	7	0
Lane Group Flow (vph)	22	1051	0	42	1125	0	250	28	0	163	156	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	3.2	48.5		4.8	50.1		22.9	22.9		22.9	22.9	
Effective Green, g (s)	3.2	48.5		4.8	50.1		22.9	22.9		22.9	22.9	
Actuated g/C Ratio	0.04	0.54		0.05	0.56		0.25	0.25		0.25	0.25	
Clearance Time (s)	4.0	4.2		4.0	4.2		5.6	5.6		5.6	5.6	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	63	1817		94	1964		295	438		345	464	
v/s Ratio Prot	0.01	c0.31		0.02	c0.32			0.02			0.09	
v/s Ratio Perm							c0.22			0.12		
v/c Ratio	0.35	0.58		0.45	0.57		0.85	0.06		0.47	0.34	
Uniform Delay, d1	42.4	13.9		41.3	13.0		31.9	25.4		28.4	27.3	
Progression Factor	1.00	1.00		0.75	0.92		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.2	1.3		0.6	0.6		18.9	0.0		0.4	0.2	
Delay (s)	43.6	15.3		31.8	12.5		50.8	25.4		28.8	27.5	
Level of Service	D	B		C	B		D	C		C	C	
Approach Delay (s)		15.8			13.2			47.0			28.2	
Approach LOS		B			B			D			C	

Intersection Summary			
HCM Average Control Delay	19.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.8
Intersection Capacity Utilization	68.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	750	160	80	890	220	200	300	70	150	380	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.2		4.0	4.2		4.2	4.2	4.2	4.2	4.2	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	0.97		1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3446		1770	3434		1770	1863	1583	1770	1825	
Flt Permitted	0.95	1.00		0.95	1.00		0.29	1.00	1.00	0.45	1.00	
Satd. Flow (perm)	1770	3446		1770	3434		540	1863	1583	834	1825	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	815	174	87	967	239	217	326	76	163	413	65
RTOR Reduction (vph)	0	20	0	0	23	0	0	0	28	0	7	0
Lane Group Flow (vph)	54	969	0	87	1183	0	217	326	48	163	471	0
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	4.8	34.4		6.4	36.0		36.8	36.8	36.8	36.8	36.8	
Effective Green, g (s)	4.8	34.4		6.4	36.0		36.8	36.8	36.8	36.8	36.8	
Actuated g/C Ratio	0.05	0.38		0.07	0.40		0.41	0.41	0.41	0.41	0.41	
Clearance Time (s)	4.0	4.2		4.0	4.2		4.2	4.2	4.2	4.2	4.2	
Vehicle Extension (s)	2.0	4.8		2.0	4.8		4.8	4.8	4.8	4.8	4.8	
Lane Grp Cap (vph)	94	1317		126	1374		221	762	647	341	746	
v/s Ratio Prot	0.03	c0.28		0.05	c0.34			0.18			0.26	
v/s Ratio Perm							c0.40		0.03	0.20		
v/c Ratio	0.57	0.74		0.69	0.86		0.98	0.43	0.07	0.48	0.63	
Uniform Delay, d1	41.6	23.9		40.8	24.7		26.3	19.1	16.2	19.5	21.2	
Progression Factor	0.97	0.89		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	4.7	3.3		12.4	7.3		55.4	0.8	0.1	2.1	2.3	
Delay (s)	44.9	24.6		53.2	32.0		81.7	19.8	16.3	21.6	23.5	
Level of Service	D	C		D	C		F	B	B	C	C	
Approach Delay (s)		25.7			33.4			41.1			23.0	
Approach LOS		C			C			D			C	

Intersection Summary			
HCM Average Control Delay	30.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.6
Intersection Capacity Utilization	85.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

J.2 - Supplemental Traffic Study

FEHR PEERS

MEMORANDUM

Date: September 6, 2013

To: Wilma Quan, City of Fresno Downtown & Community Revitalization Department
Michael Houlihan, AICP, FirstCarbon Solutions
Kirsten Helton, Caltrans Central Region

From: Rob Hananouchi & Alan Telford, Fehr & Peers

Subject: ***Fulton Mall Supplemental Traffic Analysis – 2025 General Plan***

RS10-2774.02

This memorandum presents the findings of the supplemental traffic analysis for the Fulton Mall Reconstruction Project when applying the policies from the *2025 Fresno General Plan*.

KEY FINDINGS

Based on the results provided in the Final Transportation Impact Study for the Fulton Mall Reconstruction Project, all study intersections would operate at LOS D or better during the AM and PM peak hour under Baseline Conditions and both Baseline Plus Project Conditions alternatives. Therefore, all intersections would operate at an acceptable LOS based on the policies in the *2025 Fresno General Plan*, and the project does not result in a significant impact.

Under Cumulative Conditions, the following intersections are projected to operate at LOS E or F:

- Stanislaus Street / Broadway
- Tuolumne Street / Broadway
- Fresno Street / Van Ness Avenue
- Fresno Street / H Street
- Ventura Avenue / H Street

With the Mall Open to Traffic alternatives, the following four intersection would continue to operate at LOS E or F:

- Stanislaus Street / Broadway
- Tuolumne Street / Broadway
- Fresno Street / H Street
- Ventura Avenue / H Street

The Fulton Mall Reconstruction Project would not contribute a cumulatively considerable amount of delay or additional traffic at three of the four intersections. However, traffic delays are projected to increase by more than five seconds at the Tuolumne Street / Broadway intersection over Cumulative No Project conditions.

To mitigate this impact, the City of Fresno would need to modify the signal to allow split phase operations on northbound and southbound Broadway. If the City of Fresno adopts the proposed General Plan Update policies prior to the intersection reaching LOS E or F operations, this improvement would not be necessary.

BACKGROUND

Fehr & Peers completed a transportation impact analysis for the Fulton Mall Reconstruction Project to support the environmental documents being prepared for the project. The findings of that analysis are documented in the Final Transportation Impact Report dated July 12, 2013.

As stated in the Regulatory Setting section of the Final Transportation Impact Report, the City of Fresno intends to consider the adoption of an update of the *2025 Fresno General Plan* in 2014. At the time we completed the Final Transportation Impact Report, City staff indicated that the General Plan Update would be adopted prior to the approval of the Fulton Mall Reconstruction Project. Therefore, the analysis in the Final Transportation Impact Report used policies from the General Plan Update.

We completed this supplemental traffic analysis to assess the potential transportation impacts associated with the Fulton Mall Reconstruction Project if it proceeds under the current policies of the *2025 Fresno General Plan*.

REGULATORY SETTING

The *2025 Fresno General Plan* includes the following policies related to transportation and circulation that are relevant to the analysis of the Fulton Mall Reconstruction Project:

- **Policy E-1-f**: Allow a Level of Service "D" as the acceptable level of traffic congestion on major streets. LOS "D" according to the Caltrans and COFCG accepted LOS criteria, as developed by the Florida Department of Transportation, means moderate congestion at peak traffic periods; approaching unstable flow with reduced speeds, limited maneuverability, and loss of convenience; average speeds range from 9 to 17 miles per hour on arterials with stopped delays of 40 seconds or less.

- **Policy E-1-j**: Provide areas for pedestrian and other non-motorized travel that enhance the safety, utilization, and efficiency of the street system. Pedestrian travel should be encouraged as a viable mode of movement throughout the metropolitan area by providing safe and convenient pedestrian facilities in new and existing urban areas and particularly within the Central Area and urban core community centers.

- **Policy E-1-k**: Pursue the funding for and development of sidewalks and bicycle lanes on all collector and arterial major streets and bike paths along all expressways.

- **Policy E-1-l**: All commercial and office development should be linked with pedestrian, bicycle, and transit facilities.

- **Policy E-1-m**: Achieve greater pedestrian accessibility to commercial uses from nearby neighborhoods.
- **Policy E-1-n**: Safe access and mobility for the physically impaired must be implemented in the design of all pedestrian facilities.
- **Policy E-2-a**: Pursue the implementation of Transportation Demand Management and Transportation System Management strategies, as identified by land use and air quality policies and actions of this plan, to reduce peak hour traffic demands and supplement the capacity of the transportation system.
- **Policy E-2-b**: Minimize vehicular and vehicle-pedestrian conflicts on major streets and adjacent land uses through use of traffic design and control measures that reduce congestion and increase safety.
- **Policy E-7-d**: Support the development of a multimodal transportation terminal facility in, or in close proximity to, the Central Area.
- **Policy E-9-m**: Encourage mixed use intensive cluster-type development where consistent with general plan goals and policies.
- **Policy E-9-s**: Promote the development of the Central Area as the region's principal employment center and public transportation hub
- **Policy E-13-a**: Provide bikeways in proximity to major traffic generators such as commercial centers, schools, recreational areas, and major public facilities.
- **Policy C-17-b**: The City shall identify and pursue measures to lower auto-dependence and encourage public transit (including pursuit of fixed guideway systems such as monorail or people mover), bicycle use, and walking consistent with other transit-oriented development concepts and principles.
- **Policy C-20-d**: Safe vehicular, bicycle, and pedestrian access shall be provided and maintained. Access for the disabled shall be incorporated into the project designs as required.

Policy Differences

As identified in the Final Transportation Impact Study, the General Plan Update includes the following policies related to vehicle level of service:

- **Policy MT-1-l**: Utilize to the extent feasible, a tiered system of flexible, multi-modal Level of Service standards for streets designated by the General Plan Circulation Diagram (Figure MT-1). Generally the City will strive to accommodate a peak hour vehicle LOS of "D" or better on street segments and at intersections except as further elaborated by following polices.
- **Policy MT-1-m**:Within the Downtown Neighborhoods Community Plan area and the Fulton Corridor Specific Plan area, accept motor vehicle LOS "F" conditions during peak hours on street

segments and intersections in the vicinity of these areas as specified by the applicable policies of these plans.

It is important to note that Policy E-1-f is different from these proposed policies in the General Plan Update in that the proposed Policy MT-1-l allows for exceptions to the LOS D policy. Policy MT-1-m describes one of these exceptions as accepting motor vehicle LOS "F" conditions during peak hours on street segments and intersections within the Downtown Neighborhoods Community Plan area and the Fulton Corridor Specific Plan area. This includes the Fulton Mall Reconstruction Project study area.

The remainder of this memorandum expands upon the ramifications of this policy difference.

TRAFFIC OPERATIONS RESULTS

Baseline Plus Project Conditions

Table 1 shows the AM and PM peak hour intersection operations results for Baseline and Baseline Plus Project Conditions from the Final Transportation Impact Study for the Fulton Mall Reconstruction Project. For technical calculations, refer to Appendix D in the Final Transportation Impact Study.

For the Baseline Plus Project Pedestrian Mall alternative, intersection operations would remain the same as the Baseline Conditions. For the Baseline Plus Project Mall Open to Traffic alternatives, Table 1 shows the AM and PM peak hour intersection operations under Baseline Plus Project – Mall Open to Traffic Conditions.

Based on the results in Table 1, all study intersections would operate at LOS D or better during the AM and PM peak hour under Baseline Conditions and both Baseline Plus Project Conditions alternatives. Therefore, all intersections would operate at an acceptable LOS based on the policies in the *2025 Fresno General Plan*, and the project does not result in a significant impact.

FEHR PEERS

TABLE 1:
PEAK HOUR INTERSECTION OPERATIONS – BASELINE PLUS PROJECT CONDITIONS

Intersection	Traffic Control	Baseline Conditions[1]				Baseline + Project: Mall Open to Traffic			
		AM Peak Hr		PM Peak Hr		AM Peak Hr		PM Peak Hr	
		Delay[2]	LOS[3]	Delay[2]	LOS[3]	Delay[2]	LOS[3]	Delay[2]	LOS[3]
1. Stanislaus Street / Van Ness Avenue	Signal	11	B	13	B	11	B	13	B
2. Stanislaus Street / Fulton Street	Signal	11	B	11	B	12	B	11	B
3. Stanislaus Street / Broadway	Signal	10	A	10	B	10	A	10	B
4. Tuolumne Street / Broadway	Signal	18	B	17	B	18	B	17	B
5. Tuolumne Street / Fulton Street	Signal	12	B	11	B	12	B	11	B
6. Tuolumne Street / Van Ness Avenue	Signal	12	B	13	B	12	B	13	B
7. Fresno Street / H Street[4]	N/A								
8. Fresno Street / Fulton Street[5]	Pedestrian Signal					4	A	3	A
9. Fresno Street / Van Ness Avenue	Signal	35	C	35	C	35	C	37	D
10. Tulare Street / H Street	Signal	12	B	11	B	12	B	11	B
11. Tulare Street / Fulton Street[5]	Pedestrian Signal					4	A	4	A
12. Tulare Street / Van Ness Avenue	Signal	23	C	21	C	23	C	26	C
13. Inyo Street / H Street	Signal	13	B	12	B	12	B	11	B
14. Inyo Street / Fulton Street	Signal	10	A	10	B	9	A	9	A
15. Inyo Street / Van Ness Avenue	Signal	13	B	11	B	13	B	11	B
16. Ventura Avenue / H Street	Side Street Stop-Controlled	34	D	18	C	33	D	19	C
17. Ventura Avenue / Broadway	Signal	20	C	25	C	20	C	25	C
18. Ventura Avenue / Van Ness Avenue	Signal	25	C	21	C	25	C	21	C

Notes: [1]Baseline Plus Project: Pedestrian Mall alternative would have the same traffic operations as Baseline Conditions.

[2]For signalized intersections, the overall average intersection control delay is reported in seconds per vehicle. For side-street stop controlled intersections, the average control delay for the movement with the greatest delay is reported in seconds per vehicle.

[3]Level of Service based on *Highway Capacity Manual* (Transportation Research Board, 2000).

[4]Intersection does not exist under Baseline Conditions & Baseline Plus Project Conditions.

[5]Intersection exists as a pedestrian signal and is not analyzed under Baseline Conditions. Intersection would become fully signalized under Baseline Plus Project – Mall Open to Traffic conditions.

Source: Fehr & Peers, 2013.

Cumulative Plus Project Conditions

Table 2 shows the AM and PM peak hour intersection operations results for Cumulative No Project and Cumulative Plus Project Conditions from the Final Transportation Impact Study for the Fulton Mall Reconstruction Project. For technical calculations, refer to Appendix F in the Final Transportation Impact Study.

For the Cumulative Plus Project Pedestrian Mall alternative, intersection operations would remain the same as the Cumulative No Project Conditions. For the Cumulative Plus Project Mall Open to Traffic alternatives, Table 2 shows the AM and PM peak hour intersection operations under Cumulative Plus Project – Mall Open to Traffic Conditions.

Based on the results in Table 2, the following five intersections would operate at LOS E or F during the AM and/or PM peak hour under Cumulative No Project and Cumulative Plus Project Conditions with the Pedestrian Mall alternative:

- Stanislaus Street / Broadway
- Tuolumne Street / Broadway
- Fresno Street / Van Ness Avenue
- Fresno Street / H Street
- Ventura Avenue / H Street

For the Cumulative Plus Project Conditions with the Pedestrian Mall alternative, intersection operations would remain the same as the Cumulative No Project Conditions. Therefore, the Pedestrian Mall alternative of the project would not have a cumulatively significant effect.

Based on the results in Table 2, the following four intersections would operate at LOS E or F during the AM and/or PM peak hour under Cumulative Plus Project Conditions with the Mall Open to Traffic alternatives:

- Stanislaus Street / Broadway
- Tuolumne Street / Broadway
- Fresno Street / H Street
- Ventura Avenue / H Street

The contribution of the proposed Fulton Mall Reconstruction Project to traffic delays at these four intersections is described in more detail below.

FEHR PEERS

TABLE 2:
PEAK HOUR INTERSECTION OPERATIONS – CUMULATIVE PLUS PROJECT CONDITIONS

Intersection	Traffic Control	Cumulative No Project Conditions[1]				Cumulative + Project: Mall Open to Traffic			
		AM Peak Hr		PM Peak Hr		AM Peak Hr		PM Peak Hr	
		Delay[2]	LOS[3]	Delay[2]	LOS[3]	Delay[2]	LOS[3]	Delay[2]	LOS[3]
1. Stanislaus Street / Van Ness Avenue	Signal	28	C	53	D	29	C	52	D
2. Stanislaus Street / Fulton Street	Signal	18	B	16	B	18	B	17	B
3. Stanislaus Street / Broadway	Signal	50	D	**>150**	**F**	51	D	**>150**	**F**
4. Tuolumne Street / Broadway	Signal	46	D	**>150**	**F**	41	D	**>150**	**F**
5. Tuolumne Street / Fulton Street	Signal	22	C	19	B	23	C	34	C
6. Tuolumne Street / Van Ness Avenue	Signal	38	D	40	D	35	D	39	D
7. Fresno Street / H Street	Signal	**84**	**F**	**102**	**F**	**77**	**E**	**92**	**F**
8. Fresno Street / Fulton Street[4]	Pedestrian Signal					19	B	13	B
9. Fresno Street / Van Ness Avenue	Signal	49	D	**62**	**E**	48	D	48	D
10. Tulare Street / H Street	Signal	14	B	27	C	15	B	22	C
11. Tulare Street / Fulton Street[4]	Pedestrian Signal					14	B	15	B
12. Tulare Street / Van Ness Avenue	Signal	38	D	35	C	42	D	33	C
13. Inyo Street / H Street	Signal	12	B	23	C	20	B	14	B
14. Inyo Street / Fulton Street	Signal	11	B	9	A	9	A	10	B
15. Inyo Street / Van Ness Avenue	Signal	13	B	13	B	14	B	13	B
16. Ventura Avenue / H Street	Side Street Stop-Controlled	**>150**	**F**	**>150**	**F**	**>150**	**F**	**>150**	**F**
17. Ventura Avenue / Broadway	Signal	15	B	18	B	17	B	19	B
18. Ventura Avenue / Van Ness Avenue	Signal	29	C	32	C	29	C	31	C

Notes: [1]Cumulative Plus Project: Pedestrian Mall alternative would have the same traffic operations as Cumulative No Project Conditions.

[2]For signalized intersections, the overall average intersection control delay is reported in seconds per vehicle. For side-street stop controlled intersections, the average control delay for the movement with the greatest delay is reported in seconds per vehicle.

[3]Level of Service based on *Highway Capacity Manual* (Transportation Research Board, 2000).

[4]Intersection would exist as a pedestrian signal as it does under Baseline Conditions and is not analyzed under Cumulative No Project Conditions. Intersection would become fully signalized under Cumulative Plus Project – Mall Open to Traffic conditions.

Delays greater than 2.5 minutes are not reported due to model insensitivity under extreme congestion.

BOLD text indicates the intersection operates at an unacceptable LOS based on the City of Fresno's *2025 General Plan* level of service policy.

UNDERLINED text indicates a significant impact based on the significance criteria identified in the Final Transportation Impact Report for the Fulton Mall Reconstruction Project dated July 12, 2013.

Source: Fehr & Peers, 2013.

Fulton Mall Reconstruction Project – Cumulative Contribution

Stanislaus Street / Broadway

The technical calculations show that the overall intersection delay at the Stanislaus Street / Broadway intersection decreases slightly from 165 seconds to 159 seconds during the PM peak hour with the proposed project (see Attachment A). Therefore, the project would not have a cumulatively significant impact at this location.

Tuolumne Street / Broadway

The technical calculations show that the overall intersection delay at the Tuolumne Street / Broadway intersection increases from 541 seconds to 723 seconds during the PM peak hour with the proposed project (see Attachment A). Therefore, the project would have a potentially cumulatively significant impact at this location.

Fresno Street / H Street

At the Fresno Street / H Street intersection, Table 2 shows that traffic delay would decrease with the proposed project during both the AM and PM peak hours (Refer to Appendix E and F in the Final Transportation Impact Study). Therefore, the project would not have a cumulatively significant impact at this location.

Ventura Avenue / H Street

The Cumulative No Project and Cumulative Plus Project traffic volumes at the Ventura Avenue / H Street intersection indicate that the proposed Fulton Mall Reconstruction Project is not expected to result in a substantial change in traffic at that location.

In the AM peak hour, two turning movements have a minor increase in traffic volumes that can be attributed to rounding and model variation. In the PM peak hour, one turning movement has a minor increase while one has a minor decrease that can also be attributed to rounding and model variation.

In AM peak hour, the change in traffic volumes through the intersection is an increase of less than one percent, which is well within observed variation in day-to-day traffic. Therefore, this change is not considered cumulatively significant.

In the PM peak hour, there is no net change in traffic volumes through the intersection. Similarly, this change is not considered cumulatively significant.

MITIGATIONS FOR CUMULATIVE IMPACTS

The only cumulatively significant impact caused by the proposed project would occur at the Tuolumne Street / Broadway intersection during the PM peak hour.

To mitigate this impact, the City of Fresno would need to modify the signal to allow split phase operations on northbound and southbound Broadway. As shown in Table 3, with this improvement, delay at this

intersection would be reduced to 33 seconds and operate at LOS C. See Attachment A for technical calculations.

TABLE 3:
PEAK HOUR INTERSECTION OPERATIONS –
CUMULATIVE PLUS PROJECT CONDITIONS – MITIGATED

Intersection	Traffic Control	Cumulative No Project Conditions				Cumulative + Project: Mall Open to Traffic				Cumulative + Project: Mall Open to Traffic - Mitigated			
		AM Peak Hr		PM Peak Hr		AM Peak Hr		PM Peak Hr		AM Peak Hr		PM Peak Hr	
		Delay[1]	LOS[2]	Delay[1]	LOS[2]	Delay[1]	LOS[2]	Delay[1]	LOS[2]	Delay[1]	LOS[2]	Delay[1]	LOS[2]
4. Tuolumne Street / Broadway	Signal	46	D	**>150**	**F**	41	D	**>150**	**F**	25	C	32	C

Notes: [1]The overall average intersection control delay is reported in seconds per vehicle.

[2]Level of Service based on *Highway Capacity Manual* (Transportation Research Board, 2000).

Delays greater than 2.5 minutes are not reported due to model insensitivity under extreme congestion.

BOLD text indicates the intersection operates at an unacceptable LOS based on the City of Fresno's *2025 General Plan* level of service policy.

UNDERLINED text indicates a significant impact based on the significance criteria identified in the Final Transportation Impact Report for the Fulton Mall Reconstruction Project dated July 12, 2013.

Source: Fehr & Peers, 2013.

If the City of Fresno adopts the proposed General Plan Update policies prior to the intersection reaching LOS E or F operations, this improvement would not be necessary.

ATTACHMENT A:
TECHNICAL CALCULATIONS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	290	300	80	220	490	40	120	340	300	10	90	370
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.2	4.2	4.0	4.2	4.2	4.2	4.0		4.0	4.2	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93		1.00	0.88	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1732		1770	1638	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583	1770	1732		1770	1638	
Peak-hour factor, PHF	0.92	0.92	0.92	0.96	0.96	0.96	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	315	326	87	229	510	42	130	370	326	11	98	402
RTOR Reduction (vph)	0	0	61	0	0	13	0	35	0	0	164	0
Lane Group Flow (vph)	315	326	26	229	510	29	130	661	0	11	336	0
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		2	5		6	1	
Permitted Phases			4			8						
Actuated Green, G (s)	6.0	27.4	27.4	6.0	27.4	27.4	19.0	34.0		6.4	21.0	
Effective Green, g (s)	6.0	27.4	27.4	6.0	27.4	27.4	19.0	34.0		6.4	21.0	
Actuated g/C Ratio	0.07	0.30	0.30	0.07	0.30	0.30	0.21	0.38		0.07	0.23	
Clearance Time (s)	4.0	4.2	4.2	4.0	4.2	4.2	4.2	4.0		4.0	4.2	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	118	567	482	118	567	482	374	654		126	382	
v/s Ratio Prot	c0.18	0.18		0.13	c0.27		c0.07	c0.38		0.01	0.21	
v/s Ratio Perm			0.02			0.02						
v/c Ratio	2.67	0.57	0.05	1.94	0.90	0.06	0.35	1.01		0.09	0.88	
Uniform Delay, d1	42.0	26.4	22.1	42.0	30.0	22.2	30.2	28.0		39.1	33.3	
Progression Factor	1.00	1.00	1.00	1.04	0.91	0.92	0.51	0.79		1.00	1.00	
Incremental Delay, d2	774.9	4.2	0.2	450.2	18.4	0.2	0.2	13.1		1.4	23.9	
Delay (s)	816.9	30.6	22.4	494.0	45.7	20.7	15.5	35.2		40.4	57.1	
Level of Service	F	C	C	F	D	C	B	D		D	E	
Approach Delay (s)		369.8			175.8			32.1			56.8	
Approach LOS		F			F			C			E	

Intersection Summary			
HCM Average Control Delay	162.4	HCM Level of Service	F
HCM Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.2
Intersection Capacity Utilization	96.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	130	90	80	70	20	50	650	240	190	210	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2	4.2	4.2	4.2			4.2	4.2	4.6	4.6	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.97			1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1800			1856	1583	1770	1838	
Flt Permitted	0.69	1.00	1.00	0.62	1.00			0.25	1.00	0.38	1.00	
Satd. Flow (perm)	1292	1863	1583	1155	1800			463	1583	702	1838	
Peak-hour factor, PHF	0.96	0.96	0.96	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	31	135	94	87	76	22	54	707	261	207	228	22
RTOR Reduction (vph)	0	0	73	0	12	0	0	0	69	0	4	0
Lane Group Flow (vph)	31	135	21	87	86	0	0	761	192	207	246	0
Turn Type	Perm		Perm	Perm			Perm		Perm	Perm		
Protected Phases		4			8			1			2	
Permitted Phases	4		4	8			1		1	2		
Actuated Green, G (s)	19.8	19.8	19.8	19.8	19.8			39.8	39.8	17.4	17.4	
Effective Green, g (s)	19.8	19.8	19.8	19.8	19.8			39.8	39.8	17.4	17.4	
Actuated g/C Ratio	0.22	0.22	0.22	0.22	0.22			0.44	0.44	0.19	0.19	
Clearance Time (s)	4.2	4.2	4.2	4.2	4.2			4.2	4.2	4.6	4.6	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0			2.0	2.0	3.8	3.8	
Lane Grp Cap (vph)	284	410	348	254	396			205	700	136	355	
v/s Ratio Prot		0.07			0.05						0.13	
v/s Ratio Perm	0.02		0.01	c0.08				c1.64	0.12	c0.29		
v/c Ratio	0.11	0.33	0.06	0.34	0.22			3.71	0.27	1.52	0.69	
Uniform Delay, d1	28.1	29.5	27.7	29.6	28.8			25.1	15.9	36.3	33.8	
Progression Factor	1.00	1.00	1.00	0.95	0.94			1.00	1.00	1.08	0.99	
Incremental Delay, d2	0.8	2.1	0.3	3.6	1.3			1232.4	1.0	238.3	1.0	
Delay (s)	28.8	31.7	28.1	31.9	28.4			1257.5	16.9	277.7	34.5	
Level of Service	C	C	C	C	C			F	B	F	C	
Approach Delay (s)		30.0			30.0			940.7			144.6	
Approach LOS		C			C			F			F	

Intersection Summary			
HCM Average Control Delay	541.0	HCM Level of Service	F
HCM Volume to Capacity ratio	2.35		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	95.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	260	320	80	220	490	40	130	320	280	10	80	360
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.2	4.2	4.5	4.2	4.2	4.2	4.5		4.5	4.2	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93		1.00	0.88	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1732		1770	1634	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583	1770	1732		1770	1634	
Peak-hour factor, PHF	0.92	0.92	0.92	0.96	0.96	0.96	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	283	348	87	229	510	42	141	348	304	11	87	391
RTOR Reduction (vph)	0	0	61	0	0	13	0	35	0	0	186	0
Lane Group Flow (vph)	283	348	26	229	510	29	141	617	0	11	292	0
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		2	5		6	1	
Permitted Phases			4			8						
Actuated Green, G (s)	5.5	27.4	27.4	5.5	27.4	27.4	21.5	33.1		6.3	18.5	
Effective Green, g (s)	5.5	27.4	27.4	5.5	27.4	27.4	21.5	33.1		6.3	18.5	
Actuated g/C Ratio	0.06	0.30	0.30	0.06	0.30	0.30	0.24	0.37		0.07	0.21	
Clearance Time (s)	4.5	4.2	4.2	4.5	4.2	4.2	4.2	4.5		4.5	4.2	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	108	567	482	108	567	482	423	637		124	336	
v/s Ratio Prot	c0.16	0.19		0.13	c0.27		c0.08	c0.36		0.01	0.18	
v/s Ratio Perm			0.02			0.02						
v/c Ratio	2.62	0.61	0.05	2.12	0.90	0.06	0.33	0.97		0.09	0.87	
Uniform Delay, d1	42.2	26.8	22.1	42.2	30.0	22.2	28.3	27.9		39.2	34.6	
Progression Factor	1.00	1.00	1.00	1.07	0.86	0.82	0.55	0.83		1.00	1.00	
Incremental Delay, d2	755.2	4.9	0.2	531.2	18.3	0.2	0.2	5.3		1.4	20.5	
Delay (s)	797.4	31.7	22.4	576.2	44.0	18.4	15.7	28.6		40.6	55.1	
Level of Service	F	C	C	F	D	B	B	C		D	E	
Approach Delay (s)		332.4			198.7			26.3			54.8	
Approach LOS		F			F			C			D	

Intersection Summary			
HCM Average Control Delay	158.7	HCM Level of Service	F
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.2
Intersection Capacity Utilization	92.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	130	100	70	100	30	70	580	240	170	220	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2	4.2	4.2	4.2			4.2	4.2	4.6	4.6	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.97			1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.99	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1798			1853	1583	1770	1839	
Flt Permitted	0.61	1.00	1.00	0.62	1.00			0.17	1.00	0.40	1.00	
Satd. Flow (perm)	1128	1863	1583	1155	1798			317	1583	739	1839	
Peak-hour factor, PHF	0.96	0.96	0.96	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	31	135	104	76	109	33	76	630	261	185	239	22
RTOR Reduction (vph)	0	0	81	0	12	0	0	0	74	0	4	0
Lane Group Flow (vph)	31	135	23	76	130	0	0	706	187	185	257	0
Turn Type	Perm		Perm	Perm			Perm		Perm	Perm		
Protected Phases		4			8			1			2	
Permitted Phases	4		4	8			1		1	2		
Actuated Green, G (s)	19.8	19.8	19.8	19.8	19.8			39.8	39.8	17.4	17.4	
Effective Green, g (s)	19.8	19.8	19.8	19.8	19.8			39.8	39.8	17.4	17.4	
Actuated g/C Ratio	0.22	0.22	0.22	0.22	0.22			0.44	0.44	0.19	0.19	
Clearance Time (s)	4.2	4.2	4.2	4.2	4.2			4.2	4.2	4.6	4.6	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0			2.0	2.0	3.8	3.8	
Lane Grp Cap (vph)	248	410	348	254	396			140	700	143	356	
v/s Ratio Prot		c0.07			0.07						0.14	
v/s Ratio Perm	0.03		0.01	0.07				c2.22	0.12	c0.25		
v/c Ratio	0.12	0.33	0.07	0.30	0.33			5.04	0.27	1.29	0.72	
Uniform Delay, d1	28.2	29.5	27.8	29.3	29.5			25.1	15.9	36.3	34.0	
Progression Factor	1.00	1.00	1.00	1.02	1.05			1.00	1.00	1.09	1.01	
Incremental Delay, d2	1.0	2.1	0.4	3.0	2.2			1835.2	0.1	137.0	1.2	
Delay (s)	29.2	31.7	28.1	33.0	33.0			1860.3	15.9	176.7	35.4	
Level of Service	C	C	C	C	C			F	B	F	D	
Approach Delay (s)		30.0			33.0			1362.5			94.0	
Approach LOS		C			C			F			F	

Intersection Summary			
HCM Average Control Delay	723.2	HCM Level of Service	F
HCM Volume to Capacity ratio	2.98		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	93.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	70	70	160	60	210	30	110	60	110	550	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2	4.2	4.2	4.2			4.2	4.2	4.6	4.6	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.88			1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.99	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1645			1843	1583	1770	1858	
Flt Permitted	0.36	1.00	1.00	0.71	1.00			0.99	1.00	0.95	1.00	
Satd. Flow (perm)	665	1863	1583	1322	1645			1843	1583	1770	1858	
Peak-hour factor, PHF	0.96	0.96	0.96	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	31	73	73	174	65	228	33	120	65	120	598	11
RTOR Reduction (vph)	0	0	55	0	158	0	0	0	54	0	1	0
Lane Group Flow (vph)	31	73	18	174	135	0	0	153	11	120	608	0
Turn Type	Perm		Perm	Perm			Split		Perm	Split		
Protected Phases		4			8		1	1		2	2	
Permitted Phases	4		4	8					1			
Actuated Green, G (s)	19.6	19.6	19.6	19.6	19.6			13.0	13.0	34.4	34.4	
Effective Green, g (s)	19.6	19.6	19.6	19.6	19.6			13.0	13.0	34.4	34.4	
Actuated g/C Ratio	0.25	0.25	0.25	0.25	0.25			0.16	0.16	0.43	0.43	
Clearance Time (s)	4.2	4.2	4.2	4.2	4.2			4.2	4.2	4.6	4.6	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0			2.0	2.0	3.8	3.8	
Lane Grp Cap (vph)	163	456	388	324	403			299	257	761	799	
v/s Ratio Prot		0.04			0.08			c0.08		0.07	c0.33	
v/s Ratio Perm	0.05		0.01	c0.13					0.01			
v/c Ratio	0.19	0.16	0.05	0.54	0.34			0.51	0.04	0.16	0.76	
Uniform Delay, d1	23.9	23.7	23.1	26.3	24.8			30.6	28.2	13.9	19.3	
Progression Factor	1.00	1.00	1.00	0.77	0.74			1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.6	0.8	0.2	6.1	2.2			6.1	0.3	0.4	6.8	
Delay (s)	26.5	24.5	23.3	26.4	20.5			36.7	28.5	14.4	26.1	
Level of Service	C	C	C	C	C			D	C	B	C	
Approach Delay (s)		24.3			22.7			34.3			24.2	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	25.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	72.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	130	100	70	100	30	70	580	240	170	220	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2	4.2	4.2	4.2			4.2	4.2	4.6	4.6	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.97			1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.99	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1798			1853	1583	1770	1839	
Flt Permitted	0.61	1.00	1.00	0.62	1.00			0.99	1.00	0.95	1.00	
Satd. Flow (perm)	1128	1863	1583	1155	1798			1853	1583	1770	1839	
Peak-hour factor, PHF	0.96	0.96	0.96	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	31	135	104	76	109	33	76	630	261	185	239	22
RTOR Reduction (vph)	0	0	81	0	12	0	0	0	78	0	4	0
Lane Group Flow (vph)	31	135	23	76	130	0	0	706	183	185	257	0
Turn Type	Perm		Perm	Perm			Split		Perm	Split		
Protected Phases		4			8		1	1		2	2	
Permitted Phases	4		4	8					1			
Actuated Green, G (s)	19.8	19.8	19.8	19.8	19.8			37.5	37.5	19.7	19.7	
Effective Green, g (s)	19.8	19.8	19.8	19.8	19.8			37.5	37.5	19.7	19.7	
Actuated g/C Ratio	0.22	0.22	0.22	0.22	0.22			0.42	0.42	0.22	0.22	
Clearance Time (s)	4.2	4.2	4.2	4.2	4.2			4.2	4.2	4.6	4.6	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0			2.0	2.0	3.8	3.8	
Lane Grp Cap (vph)	248	410	348	254	396			772	660	387	403	
v/s Ratio Prot		c0.07			0.07			c0.38		0.10	c0.14	
v/s Ratio Perm	0.03		0.01	0.07					0.12			
v/c Ratio	0.12	0.33	0.07	0.30	0.33			0.91	0.28	0.48	0.64	
Uniform Delay, d1	28.2	29.5	27.8	29.3	29.5			24.7	17.3	30.7	31.9	
Progression Factor	1.00	1.00	1.00	1.02	1.05			1.00	1.00	0.92	1.02	
Incremental Delay, d2	1.0	2.1	0.4	3.0	2.2			15.0	0.1	0.4	0.7	
Delay (s)	29.2	31.7	28.1	33.0	33.0			39.8	17.4	28.6	33.2	
Level of Service	C	C	C	C	C			D	B	C	C	
Approach Delay (s)		30.0			33.0			33.7			31.3	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	32.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	93.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Appendix K: Utility Information

K.1 - Utility Technical Report

Fulton Corridor Specific Plan and Community Plan EIR Technical Report

Sherwood Design Engineers

2/6/2013

Table of Contents

1. Introduction 1
    1.1 Specific Plan and Community Plan 1
    1.2 Overview 1
2. Wet Utilities 3
    2.1 Potable Water 3
        2.1.1 Existing Conditions 3
        2.1.2 Development Conditions 7
        2.1.3 Water Demand Analysis 10
        2.1.4 Infrastructure Improvements 13
    2.2 Sanitary Sewer/ Wastewater Treatment 20
        2.2.1 Existing Conditions 20
        2.2.2 Proposed Conditions 22
        2.2.3 Wastewater Volume Analysis and Results 23
        2.2.4 Collection System Analysis 25
    2.3 Recycled Water 27
        2.3.1 Existing Conditions 27
        2.3.2 Estimated Recycling Potential 29
        2.3.3 Recycled Water Demand and Distribution 29
3. Stormwater Management 31
    3.1 Existing Conditions 31
    3.2 Proposed Conditions 32
    3.3. Storm Water Quantity and Quality Analysis and Results 33
        3.3.1 Methodology 33
        3.3.2 Results 34
    3.4 Infrastructure Improvements 36
Appendix 1: Background Information I
Appendix 2: Wet Utilities VIII
Appendix 3: Stormwater XXIII
Appendix 4: Downtown Community Plan Density Analysis XXXIII
Appendix 5: Downtown Community Plan Unit Count by Superblock XXXV
Appendix 6: Water Distribution Network Model XXXVII
Appendix 7: Sewer System Model Report XXXIX

1. Introduction

The City of Fresno's Downtown Neighborhoods Community Plan (DNCP or Community Plan) and Fulton Corridor Specific Plan (FCSP or Specific Plan) lay out Fresno's long-term goals for the adjoining areas covered by these jointly developed plans. Both Plans establish detailed policies concerning land use and development, transportation, the public realm of streets and parks, infrastructure, historic resources, and health and wellness. This Technical Report will serve as a basis for quantitative assessment of the infrastructure elements required to support build out of each plan. These elements include the supply and distribution networks for potable water and recycled water, and the collection, treatment and management systems for storm water and domestic wastewater.

1.1 Specific Plan and Community Plan

Geographic context for the Community Plan and the Specific Plan is presented in Figures 1.1 and 1.2 in Appendix 1, which show that the FCSP is completely surrounded by the DNCP. The proposed development programs for the areas covered by the FCSP and the DNCP, jointly referred to in this report as the "Plan Area," are shown in Tables 1.1 and 1.2 in Appendix 1, while Zone maps for each plan are shown in Figures 1.3 and 1.4 of Appendix 1. The anticipated distributions of land uses in the Specific and Community Plans are also presented within Tables 1.1 and 1.2 in Appendix 1. This information will be used to quantify the changes in the City's downtown infrastructure systems that may be required to support future conditions throughout the Plan Area.

1.2 Overview

The areas covered by the Specific Plan and the Community Plan are adequately served by the City's existing water, sewer and stormwater infrastructure. However, many of these utility networks are aging and in need of upgrades to ensure proper long-term function for existing users, as well as to accommodate future economic growth, business expansion and residential development.

Much of the existing downtown water distribution system is over 50 years old and nearing the end of its useful life; as such improvements are needed to reduce widespread leakage and improve structural reliability. In addition, projected population growth and neighborhood densification may necessitate the upgrade of many individual lines, primarily to provide adequate fire flow. These

problems are exacerbated by high rates of water consumption throughout the City, which are straining the City's available sources of water and increasing the demands placed on local distribution systems. As discussed in this report, Fresno has recently adopted a number of policies designed to identify and develop alternative sources of water, promote conservation measures to reduce the demand for potable water, and substitute potable water with recycled water wherever possible.

Sewer capacity upgrades are needed to accommodate currently-planned population growth and associated wastewater loading. To offset water demand for non-potable uses, plans are currently underway to expand and further establish the City's Recycled Water System, including the installation of tertiary treatment facilities.

Stormwater infrastructure suffers capacity-related limitations during large rainfall events in some areas. The Plan Areas are characterized by large impervious areas, and contain areas that are susceptible to localized nuisance flooding. Proposed development is not expected to exacerbate this condition, and will likely even improve the current condition, because total runoff is not anticipated to increase.

As the City of Fresno moves toward a resource efficient future, the manner in which infrastructure integrates into the framework of the Plan Areas will be critical to the success, viability, and continued growth of these unique places and facilities. Implementation of the plans and design methodologies set forth in the FCSP and DNSP and referenced in this report will help the City to achieve its development goals while providing high quality utility services to residents, visitors and commercial interests.

2. Wet Utilities

Wet utilities within the combined Plan Area will be affected by an overall increase in population and density as downtown Fresno continues to develop. This section identifies the changes in capacity requirements anticipated to result from this development and describes specific infrastructure improvements that will be needed to accommodate the changes. The section is divided into three parts: Potable Water, Wastewater and Recycled Water.

2.1 Potable Water

Overall use of potable water is projected to increase as growth occurs within the Downtown area in accordance with the proposed Fulton Corridor Specific Plan and the Downtown Neighborhoods Community Plan. To quantify these changes in demand, this section presents estimates of existing water use based on information presented in the City's 2008 Urban Water Management Plan (2008 UWMP),[1] and calculates future use based on modified demand rates developed as part of this analysis.

2.1.1 Existing Conditions

2.1.1.1 Potable Water Sources

Presently, the City of Fresno uses a combination of groundwater and treated surface water to meet its demands. Total use of these sources was projected to equal approximately 163,300 acre feet (af) in 2010, according to the 2008 UWMP (see Table 2.1 in Appendix 2).

<u>Surface Water</u>

Surface water is supplied from three sources:

- United States Bureau of Reclamation (USBR): 58,200 acre-feet/year
- Fresno Irrigation District (FID) contract for Kings River water: 94,800 acre-feet/year
- Water available through the City's Wastewater Recycle Exchange Agreement with FID: 13,800 acre-feet/year

The "normal year" contract volumes shown were projections for the year 2010 in the 2008 UWMP. The USBR and FID Recycled Exchange volumes are not

[1] City of Fresno, Urban Water Management Plan, August, 2008, Table 5-5.

anticipated to change, but the FID volume is scheduled to increase to 133,300 acre-feet/year (af/yr) by the year 2030, bringing the total surface water supply to 205,300 af/yr. It is noted these average amounts for the USBR and FID contracts may vary widely from year to year, depending on rainfall conditions. According to the City's 2008 Urban Water Management Plan (2008 UWMP), the total available surface water supply could range from a maximum of 233,700 af/yr under "wet" conditions to a minimum of 96,800 af/yr under "critical-low" conditions.

These available surface water supplies are treated at the City's Surface Water Treatment Facility (SWTF) located in northeast Fresno. The existing SWTF has a design capacity of 30 MGD. Based on this design capacity, and assuming the SWTF is down for a total of 30 days throughout the year for maintenance activities, the SWTF can provide up to approximately 30,800 af/yr of treated surface water. Due to additional operational constraints, the SWTF has a current capacity of only 27.5 MGD, or about 28,300 af/yr with a historical average of around 19,100 af/yr. Current plans call for increasing total treatment capacity through improvements at the SWTF and construction of a second plant to 123,400 acre-feet/year, or 60 percent of the City's planned normal year surface water supply.

Groundwater

The City is one of many water purveyors that use groundwater from the Kings Subbasin, which is part of the greater San Joaquin Valley Groundwater Basin (SJV Basin). The City currently operates approximately 250 active municipal supply wells within the Kings Subbasin to supply a major portion of its total demand. Until late 2004, Fresno relied solely on pumped groundwater to meet all demand within its service area, but began utilizing surface water in that year because the Kings Subbasin had been identified by the California Department of Water Resources (DWR) as one of eleven California groundwater basins in critical overdraft. To address this issue, the City and nine other public and private agencies have joined together to support the Fresno Area Regional Groundwater Management Plan, with the objective of monitoring, protecting and sustaining groundwater within the region. Of particular importance is a goal to "Correct the overdraft and stabilize groundwater levels …" Accordingly, the City has made it a key objective to balance groundwater operations by the year 2025, so that groundwater pumpage equals inflow to the groundwater subbasin.

To achieve the goals of the Groundwater Management Plan and ensure the long term viability of its groundwater resource, Fresno's reliance on groundwater for potable use declined from 100% to 88% between 2004 and 2007, and is projected to further decline to 40% by 2030. As outlined in the 2008 UWMP, the total planned water supply for the year 2030 is 249,000 acre-feet, which is 85,700 acre-feet more than was projected for 2010 supply (actual figures for 2010 are not available). Over this 20-year period, the use of surface water is projected to grow by approximately 92,000 acre-feet, the use of groundwater is projected to decline by 31,000 acre-feet, and the use of recycled water (to replace potable water for permitted uses) is projected to grow by more than 24,000 acre-feet. Table 2.1 in Appendix 2 shows a summary of the City's anticipated water supplies, as outlined in the 2008 UWMP. [2]

Plan Area Supplies

In 2009, West Yost Associates completed a hydraulic evaluation of the Downtown water supply network to determine whether the existing pipes and sources of supply had the capacity to meet increased demand associated with buildout of the 2025 General Plan.[3] Although the City's water system is completely interconnected, it is divided into four zones usually operated as stand-alone nodes that primarily rely on local groundwater supplies. Demand within the Downtown area is met by six existing groundwater wells (two are currently inactive), which had a total capacity in 2008 of 8327 gallons per minute (gpm), or approximately 12 million gallons per day (mgd). The 2009 Hydraulic Evaluation determined this would be insufficient to meet future peak demands while also providing a minimum 3500 gpm fire flow to the areas of highest density, and so recommended replacing the two inactive wells with a single new well and rehabilitating a third well to increase its capacity.[4] At the City's request,

---

[2] The UWMP matched the City's future supply precisely to projected demand in the year 2030 by using groundwater to make up the difference between total demand and anticipated "normal" year supplies of surface water and recycled water. The targeted surface and recycled water volumes were chosen so groundwater use will continue to decline, but the City expects groundwater will remain a flexible source that will allow it to continue meeting all water supply obligations.

[3] West Yost Associates, Technical Memorandum: Hydraulic Evaluation of the Downtown Central Area, March 1, 2009. The "Downtown" area covered by the Technical Memo corresponds to the Fresno Triangle, which is bounded by Highways 99, 41 and 180. This area extends beyond the limits of the FCSP but excludes large portions of the DNCP.

[4] As noted in the text, the 2009 Hydraulic Evaluation studied an area that included all of the FCSP and a portion of the DNCP, so the recommendation to install new/rehabilitate existing wells was addressing a distribution system need that overlapped the subject Plan Areas. The DNCP includes another 13 active wells, but it is not known to what extent their service area

West Yost updated the 2009 Hydraulic Evaluation in 2011 in an attempt to find an alternative to the recommended well rehabilitation. The Update concluded that an enhanced connection to a seventh well, located outside the immediate Downtown area, would provide an equivalent supply benefit.[5]

2.1.1.2 Potable Water Distribution System

The City's potable water transmission and distribution system consists of:

1. Regional Transmission Main (RTM) System: Pipes generally 24 inches in diameter or larger that convey water from the Northeast Surface Water Treatment Facility (NESWTF) to neighborhoods throughout the City.
2. Transmission Grid Main (TGM) System: 16 inch diameter water mains that connect the RTM System and individual supply wells to local distribution zones.
3. Distribution System: A 1,740 mile network of distribution pipes that range in size from 6 inches to 14 inches in diameter, providing connections to individual customers and supplying the City's fire suppression system.
4. Storage Tanks: Reservoir storage that provides operational flexibility and additional peaking capacity to reduce demands on supply and transmission facilities.

In addition to the well improvements described above, the 2009 Hydraulic Evaluation determined that 3 million gallons of storage would be needed in the Downtown area to reliably meet fire flow requirements plus peak hour demands. The evaluation also concluded the area needed approximately 5270 feet of new 16-inch pipeline and 9050 feet of new 24-inch pipeline to ensure water supplies could be properly distributed throughout the Downtown, and to improve existing connections to outside wells and the City's surface water treatment plant. Installation of these major transmission mains would be in addition to replacement of an undetermined number of smaller pipes that may not be able to meet future, 2025 General Plan demands, depending on the distribution and density of development. The evaluation anticipated the City would assess the suitability of these existing facilities as it receives applications for development

---

coincides with the DNCP boundary or whether additional wells (and other infrastructure, as described in the following paragraph) would be needed to serve this much larger planning area's build-out demands.

[5] West Yost Associates, Technical Memorandum: Hydraulic Evaluation Update of the Downtown Central Area, May, 2011.

and better defines localized demand conditions throughout the Downtown neighborhood.

The Hydraulic Evaluation mainly focused on the suitability of the Downtown distribution system to meet future demands, but the Fresno Department of Public Utilities (DPU) is also addressing issues related to the reliability and suitability of an aging pipe network. In the FCSP area alone, over 18,000 feet of pipe are known to have been installed before 1950, and another 20,000 feet of pipe are suspected to have been installed in the same time period. Thus, approximately 38,000 feet of existing water lines are either approaching, or have already exceeded the end of their useful life-cycle.[6] As a result, the City should also inspect or otherwise evaluate the condition of existing distribution piping as part of the Hydraulic Evaluation's recommended distribution system capacity assessment, prior to constructing right of way surface improvements associated with Downtown redevelopment efforts. Replacing deficient pipes as part of a larger street improvement program would generally lower the cost of replacement while greatly reducing the need to excavate newly paved streets to find and repair future leaks after an area has been redeveloped.

The existing FCSP water distribution system is shown in Figure 2.1 in Appendix 2.

2.1.2 Development Conditions

2.1.2.1 Existing Land Use

Existing land uses within both Plan Areas were determined from City of Fresno GIS data, which classifies parcels on the basis of the City's Land Use Codes. These codes were then consolidated to conform with the applicable Customer Class designations used to estimate water demand in the UWMP: Single Family Residential, Multi-Family Residential, Commercial/Institutional, Industrial, and Landscape Irrigation (Table 2.2). In addition, aerial photographs were examined to accurately identify parcels that were either vacant or under-utilized, which included uses such as surface parking lots and existing buildings that did not match the allowable FAR.

[6] Estimated lengths of aging pipelines are based on a 2010 analysis by Sherwood Design Engineers, using GIS files of the infrastructure within the FCSP Area provided by the City of Fresno.

2.1.2.2 Future Land Use

As described in Moule & Polyzoides April 28, 2011 Technical Memorandum, it was assumed that growth in accordance with the land uses and densities set forth in the proposed plans would only occur on parcels designated as currently vacant or underutilized.[7] Uses and densities on parcels considered to be already developed would not change. Based on this assumption (as further described below), it is estimated the total resident population within the combined plan areas would increase by 41 percent over 2010 levels under the maximum buildout scenario, to 99,081 by the year 2035. This total is only 312 persons lower than projected under the 2025 General Plan, a difference of less than one half of one percent, so there would be no significant change in the number of residents within the combined areas (see Table 1.3 in Appendix 1 for population projections under the current Municipal Code).[8] However, the proposed plans would shift density from the Downtown Neighborhoods into the Fulton Corridor, where there would be a higher concentration of multi-family units. This would bring more people and water consuming activities into the Fulton Corridor than would be expected under the 2025 General Plan, although only in the residential sector. Economic studies indicate there would be little change in the amount and mix of commercial/industrial development under either growth scenario, in both the FCSP and the DNCP, since these activities will continue to be market driven.[9]

The growth totals presented in the preceding paragraph are based on estimates of the number of square feet of residential, commercial or industrial space that could potentially be created on individual vacant and underutilized parcels, subject to the development restrictions assigned to each land use type by the FCSP and the DNCP. These restrictions were used to calculate potential maximum and minimum build-out conditions, which represented, respectively, the most intense development of each parcel's potential building envelope (minimum setbacks and maximum height) and the least intense (maximum

---

[7] Technical Memo: FCSP & DNCP Development Potential, addressed to Wilma Quan, City of Fresno, by Moule & Polyzoides Planners & Architects, April 28, 2011. Calculation of future development capacity in the DNCP included only vacant parcels, while calculations for the FCSP included both vacant and underutilized.

[8] Ibid., Moule & Polyzoides Planners & Architects, April 28, 2011, Tables 8 & 9. Note that 12 percent of the projected FCSP and DNCP population growth (equal to 860 dwelling units, at an assumed 1.9 persons per unit) would occur as existing vacant or underutilized homes and apartments become fully occupied, as opposed to construction of new units.

[9] Personal communication, Juan Gomez-Novy, Moule & Polyzoides Planners & Architects, February 23, 2012.

setbacks and minimum height). The resulting FARs for each land use type were then averaged across a development zone to obtain a maximum and a minimum FAR for the zone. These FARs were then multiplied times the total number of square feet included within vacant or underutilized parcels to obtain the zone's total development potential, as measured in square feet. Finally, this total was then allocated among four land use classifications (residential, office, retail and industrial) on the basis of regional population growth and general market demands to estimate the amount of each type of development projected for each zone.[10]

Specific Plan:

Calculations performed using this methodology indicate the FCSP would support the construction of approximately 14.12 million square feet of new building space,[11] of which it is estimated 7.55 million would be residential uses and 6.57 million would be commercial or industrial uses. The residential development potential corresponds with the Fresno Downtown Neighborhoods Community Plan and Fulton Corridor Specific Plan EIR Notice of Preparation (NOP), which states the Fulton Corridor residential development potential could result in 6,293 new units, increasing the 2010 population by 11,958, to 15,834.[12] The Plan Area's commercial and industrial spaces would support more than 18,300 new jobs.[13] Please refer to Table 1.1 in Appendix 1 for a compilation of these development square footages and for a breakdown of the commercial/industrial totals into office, retail and industrial categories.

---

[10] The derivation of average development zone FARs and the allocation of anticipated growth among the four development categories is described more thoroughly in the previously cited April 28, 2011 Technical Memo by Moule & Polyzoides Planners & Architects.

[11] Development potential numbers calculated for the Specific Plan Area were based on program data received by Sherwood Design Engineers on April 28,2011, and are based on areas delineated by Land Use Zone boundaries (ex: CBD1, CBD2, Chinatown District, etc), some of which extend beyond the boundary of the Specific Plan Area. These larger Land Use Zones result in higher gross square footages of buildable area across each type of development (Residential, Office, Retail, and Industrial) than reported in the April 5, 2012 public draft of the Fulton Corridor Specific Plan. According to Chapter 3 of this plan, the total development potential under maximum buildout of the FCSP is 13.20 million sf, consisting of 6,293 new dwelling 1200 sf units, 3.9 million sf of new office space, 1.6 million sf of new retail space and 145,085 sf of new industrial uses. Sherwood's gross square footage calculations reported here and submitted to West Yost Associates for modeling are greater, and thus more conservative, than the figures reported by the Fulton Corridor Specific Plan. The areas utilized by Sherwood for the Specific Plan Area water demand calculations are shown graphically in Fig 1-3 in Appendix 1.

[12] Notice of Preparation and Scoping Meeting. City of Fresno, DARM Department. April, 2012.

[13] Op.Cit., Moule & Polyzoides Planners & Architects, April 28, 2011, Table 10.

Community Plan: Growth potential within the DNCP is presented in Table 1.2, which shows that development of vacant parcels would support 9.7 million square feet of new construction, with 4.4 million square feet of new housing and 5.3 million square feet of new commercial/industrial space (Table 1.2 in Appendix 1). Residential units were still assumed to average 1200 square feet per dwelling unit, but this Plan Area would likely be more family oriented, so each home would contain an average of 4.13 persons. As a result, there would be about 3,700 new homes with 15,268 residents, increasing the 2010 population to 81,612. New commercial development would generate an estimated 11,800 jobs.

2.1.3 Water Demand Analysis

2.1.3.1 Existing Water Use

The 2008 UWMP projected future water use throughout the Fresno Water Service Area by applying land use based demand rates to the estimated number of acres within each of the five Customer Classes listed in Section 2.1.2.1 (the UWMP actually used six Classes, but one was developed specifically for the Southeast Growth Area and so does not apply to Downtown water demand). These rates, which are expressed as acre feet of water demand per acre per year, were applied in this analysis to the estimated number of acres, measured on the basis of individual parcels, contained within each Customer Class in the FCSP and the DNCP. In both Plan Areas, only parcels with no buildings (such as parking lots and vacant land) were assumed to have no existing water demand.

Using this information, it was determined that existing (2010) water demand in the Specific Plan area was approximately 684,000 gpd, of which 513,000 gpd was attributed to developed parcels and 171,000 gpd to vacant and underutilized parcels (Table 2.3 in Appendix 2). In the Community Plan area, by contrast, total demand was estimated to be approximately 11.2 million gpd with 178,000 gpd attributed to vacant parcels. The results of this analysis are presented in Table 2.4 in Appendix 2, but it is noted they cannot be directly compared with demands calculated for the 2008 UWMP. This is because demand estimates presented in the UWMP were developed for the entire City, with no breakdown by individual neighborhood. However, the unit demand rates used for this existing condition analysis were taken from the 2008 UWMP, so it can be assumed the results are consistent with the conclusions reached in that document.

2.1.3.2 Future Water Demand – Proposed Development Program

The land use demand rates used to calculate existing condition water use were developed to reflect City-wide demand conditions. As a result, they were based on the suburban densities that are typical in Fresno, and do not necessarily reflect the generally higher densities and levels of development anticipated throughout the Downtown. To refine these demands and obtain a more accurate estimate of future water use in the FCSP and the DNCP, the demand rates were modified to reflect actual building square footages, rather than just parcel areas. These modified rates were based on studies of a similarly dense California urban area with metered service, to more accurately reflect future conditions within downtown Fresno.[14] They were applied to all vacant and underutilized parcels in the FCSP and to all vacant parcels in the DNCP, while assuming water demand would remain mostly unchanged on parcels classified as already developed in the FCSP and on parcels classified as either underutilized or already developed in the DNCP.[15] Because the proposed plans only specify the anticipated mix of development within each development zone, it was not possible to assign a specific demand rate to each parcel. Instead, a weighted average of the anticipated water demand for each land use based on this mix (in accordance with the land uses set forth in Table 1.1) was calculated for each zone, and the resulting rate was applied to the development potential of each parcel as calculated through application of the zone's planned FAR.

The dwelling unit and building square footage totals listed in Section 2.1.2.2 for future development of vacant and underutilized parcels were multiplied times these new demand rates to calculate water use attributable to future development. This subtotal was then added to the demands for already developed parcels to estimate the total future water demands listed below and presented in detail in Tables 2.5-2.6 of Appendix 2. As the table shows, these demands were broken down by Development Zone within each Plan Area to facilitate evaluation of the local distribution system, as described below.

---

[14] It was determined that wastewater generation rates developed by the City of Oakland would provide a good match for future water use/wastewater generation within Fresno's downtown areas, owing to the mixed use nature of much of the development within Oakland's boundaries. To convert wastewater generation into water demand and account for water that does not end up in the sewer, the wastewater rates were increased by a uniform 20 percent. The resulting rates, which were applied to the future development of vacant and under-utilized parcels, are shown in Tables 2.5 and 2.6 of Appendix 2.

[15] Although existing levels of water use were held constant for most demand categories, the future demand rate was reduced by approximately 8.5 percent after 2010 for single family homes, in accordance with 2008 UWMP demand projections.

The results of this analysis were provided to West Yost Associates for use in the water distribution network model, as described below in Section 2.1.4.1.

Specific Plan: Using the methodology outlined above, demand on all currently vacant and under-utilized parcels in the FCSP at maximum build-out (some of which have existing water use) is expected to be approximately 2.81 mgd. This would be an increase on these parcels of 2.64 mgd over existing conditions, and it would raise total water use to 3.32 mgd when combined with an estimated demand of 0.51 mgd on already developed properties.[16]

Community Plan: Projected water demand is expected to rise in the Community Plan area by 2.71 mgd if all currently vacant parcels are built out to the maximum limit permitted under the proposed plan. However, this would be partially offset by an approximately 0.49 mgd decrease in demand resulting from increased conservation by existing water users, in accordance with the UWMP. As a result, total water use is expected to rise from 11.86 mgd to 14.07 mgd, or 2.21 mgd higher than the area's estimated existing demand.

Water Demand Summary: Comparison to Current Municipal Code & UWMP
For residential development, the General Plan projected the combined FCSP and DNCP areas would accommodate a total of 99,393 residents at buildout. The proposed development plans, by contrast, estimated these combined areas would accommodate 99,081 residents, a reduction of only 312 people, or less than one half of one percent. Similarly, based on economic studies prepared as part of the FCSP and DNCP planning process, it is assumed that commercial and industrial development will be largely market driven, so the amount and type of development that actually occurs should not differ substantially from the projections made for the 2025 General Plan. Consequently, it can be concluded that maximum build-out under the proposed development programs will be essentially the same as it would be if development proceeds in accordance with the current Municipal Code.

Development of the FCSP and DNCP in accordance with the proposed development plans would increase total water use in these portions of

[16] The previously cited existing condition flow of 684,000 gpd included approximately 171,000 gpd from underutilized properties the specific plan assumed would undergo redevelopment. As a result, the existing condition flow added to the calculated flow from new development is only 513,000 gpd (684,000 – 171,000).

Downtown by approximately 4.84 mgd by the year 2035, as compared to 2010 levels of demand. Of this total, water use in the FCSP would increase by approximately 2.64 mgd and water use in the DNCP would increase by approximately 2.21 mgd. As previously noted, the 2008 UWMP did not estimate Fresno's future water demand by neighborhood, so it is not possible to directly determine if it accounted for these localized levels of growth. However, comparisons can be made by converting total water use into per capita water demand, which the UWMP also calculated.

As shown in Table 2.7, estimated per capita water use within the FCSP and the DNCP was roughly equal in 2010 (the "existing" condition year), and both were more than 20 percent lower than in the City as a whole. City-wide per capita consumption under future conditions (assumed to be the year 2035 for this report, but projected as the year 2030 in the 2008 UWMP and in Table 2.7), is expected to increase by approximately eight and one half percent, while this analysis indicates per capita consumption will rise by nearly 17 percent in the FCSP and fall by three and one half percent in the DNCP. This growing disparity between the Plan Areas is related to the higher levels of commercial/industrial development proposed within the FCSP, which increases the residents' per capita demand, and also to the higher resident densities per dwelling unit anticipated for nearly all of the new housing in the DNCP, which lowers per capita demand. Despite these differences, both Plan Areas would use significantly less water on a per capita basis than the City as a whole, which suggests the projected increased water use, at least within these two parts of the Downtown, was accounted for in the 2008 UWMP's future demand estimates. As a result, development of the FCSP and DNCP in accordance with the proposed plans should not require any modification of the City's existing long range water supply plans. However, as further described below, differences in the distribution of this growth throughout the Downtown could have localized effects on the water distribution system.

2.1.4 Infrastructure Improvements

2.1.4.1 Methodology and Results

Water Distribution System—Specific Plan Area

In 2011, West Yost Associates re-examined the Downtown distribution system, but with a focus on the FCSP to identify deficiencies that might prevent it from

adequately serving the Plan area's anticipated growth in demand.[17] Inputs to the model included the per parcel demands calculated in Section 2.1.3.2, plus a fire flow requirement of 3500 gpm at 20 psi residual pressure.[18] To replicate conditions that occur during the periods of peak demand used to design distribution systems, WYA increased the average flow rate computed for each parcel by a factor of 2.9 before adding in the fire flow, at varying locations. In this way, the model was able to identify the worst case combination of peak domestic demand and localized fire flow demand for determination of the capacity and associated pipe size needed for each water main segment. The full report prepared by WYA is attached as Appendix 6.

As a basis for WYA's modeling effort, it was assumed the improvements recommended in the Downtown Central Area Hydraulic Evaluations performed in 2009 and 2011 would be constructed: new 16 and 24-inch water mains, well improvements, plus 3 mg of new storage. As a result, the Fulton Corridor Hydraulic Evaluation only identified the additional system upgrades needed to supplement these facilities as required to meet future demands. These upgrades included replacing approximately 1,400 linear feet of existing small diameter pipes with 8-inch lines, installing approximately 7,660 linear feet of new 8-inch lines, and constructing 1.5 MG of storage in addition to the 3 MG already planned for this area. It is assumed the previously identified site for the planned Downtown tank will be able to accommodate this additional storage, so a second tank site would not be required. The results of WYA's modeling are shown graphically in Figure 2.3 (Appendix 2), and the full technical memorandum is provided in Appendix 6.

It is noted that although these water system improvements are in addition to those listed in WYA's 2009 Hydraulic Evaluation and 2011 Update, those studies anticipated that more improvements would ultimately be needed, but could not be identified until future patterns of development were better defined. The improvements recommended in the Fulton Corridor Hydraulic Evaluation

---

[17] West Yost Associates, Hydraulic Evaluation of the Proposed Fulton Corridor Plan Project, July 22, 2011.

[18] On the basis of proposed building type and height, fire flow requirements in some areas could be as high as 6250 gpm. However, because the City expects these demands will be mitigated through installation of building sprinklers, a City Fire Protection Engineer instructed WYA to use a maximum fire flow demand of 3500 gpm throughout the plan area. Consequently, the City would need to enact a policy requiring the use of sprinklers in all buildings above a minimum size to ensure adequate levels of fire protection if the local distribution system is improved in accordance with the results of the West Yost analysis.

represent this next level of design evaluation, in accordance with the land uses proposed in the FCSP. However, within planned mixed use areas like the FCSP, it is not practical to firmly identify either the size or extent of water system improvements that may ultimately be required until the level and distribution of development can be more accurately determined. As a result, the improvements described in the Hydraulic Evaluation may still need revision. It is not anticipated this would result in significant changes to any identified construction-related impacts, though, because:

- The minor changes in pipe diameter these revisions would likely entail would have little effect on the construction process or on existing utilities in the vicinity.
- If new pipeline segments not currently identified as needing replacement or upgrading are added to the construction program, it is expected there would be a corresponding reduction in the number of already identified segments. This is because higher water demand in one area would be matched by reductions in another, since the overall demand for water under the proposed development program would remain unchanged.
- Aside from potentially different traffic control requirements, it is anticipated construction impacts associated with pipeline construction in any part of the FCSP or the DNCP would be similar to all other areas, so a change in the location of required improvements, or even an expansion of the pipelines program, should not introduce impacts that have not already been identified and mitigated.[19]
- The overall demand for water is not expected to change significantly from the projections presented in this report, so modifications to the Hydraulic Evaluation's pipe improvement program should have no effect on the City's water supply or on the construction or size of planned storage facilities.

Water Distribution System—Community Plan Area

The Fulton Corridor Hydraulic Evaluation did not include the DNCP, so there are no specific recommendations for distribution system improvements, additional storage facilities or new supply wells to serve build-out of this larger

[19] It is recognized that introduction of water system improvements into an area where none are currently proposed could generate previously unidentified impacts in the vicinity of sensitive noise receptors (eg. medical facilities), or require special construction measures to protect archaeological sites or historic buildings. Identification of these and other parcel-specific construction constraints is beyond the scope of this analysis, and can only be addressed in the context of general mitigation measures to be employed in the event such constraints are encountered.

area. As noted above, though, the (maximum) build-out population would be nearly identical to that envisioned under the 2025 General Plan, and no significant changes are anticipated in the overall level of commercial/industrial development. Consequently, total consumptive water demand under the proposed plan would be largely unchanged from General Plan projections, so it is expected the area's existing water distribution network would support densification of the Plan Area in accordance with the DNCP, as long as the City continues to implement recommendations set forth in the 2008 UWMP and in the Fresno Metropolitan Water Resources Management Plan.[20] It is noted, though, that individual pipelines may require upgrades beyond those recommended in these studies to accommodate both higher fire flows and higher localized demands associated with the proposed concentration of development along the Plan Area's commercial corridors.

In addition, Micheal Despain, Deputy Chief and Fire Marshal of the Fresno Fire Department, has stated that Densification of the Downtown Community Plan Area is consistent with the Fire Department's goals of faster response times and reduced staffing requirements, through the establishment of fewer, more centralized, fire stations.[21] As noted above, though, densification can result in a need for higher fire flows. The Fire Department expects the City's minimum fire flow requirement of 1500 gpm would be adequate within the Community Plan Area for densities up to a four-plex multi-family building, but 6-plex and 8-plex buildings would require flows of 2500 gpm. However, the Fire Department is concerned that all parts of the existing distribution system might not be able to accommodate these higher flow rates, so flow and pressure testing would be needed to identify where deficiencies exist. In such areas, fire flow requirements could potentially be reduced through the installation of commercial fire sprinkler systems and adequate fire walls (as described for the FCSP), so it may not be necessary to upsize all pipes with insufficient capacity. However, the City would still have to perform regular maintenance and install system upgrades on an as-needed basis.

In the event that distribution system upgrades are required as the DNCP develops, construction and the associated impacts would be similar to what is anticipated in the FCSP, with little difference on the basis of specific location. As

---

[20] Martin Querin, PE, Fresno Department of Public Utilities, personal communication with Sherwood Design Engineers, January 25, 2012.

[21] As per conversation with Michael Despain, Deputy Chief and Fire Marshal of the Fresno Fire Department, on November 15, 2011.

a result, the limitations on constructed-related impacts described for the FCSP would apply equally to the DNCP.

2.1.4.2 Demand Reduction Policies and Programs

Although residential population growth throughout Fresno will increase overall domestic water use, the City has outlined a number of initiatives designed to slow the rate of increase and lower its future water supply requirements. These initiatives are focused in two areas: increasing the use of recycled water for irrigation and decreasing per capita use of potable water.

According to the 2008 UWMP, a number of large landscape conservation programs are currently being implemented, and the City expects the use of recycled water for irrigation to increase from 750 acre-feet per year to 25,000 acre feet per year between 2010 and 2025. Because densification of the Downtown Plan Areas would not substantially increase the amount of irrigated landscape, use of recycled water for existing landscaping should offset some of the projected growth in total domestic demand. This use, however, would depend on development of the treatment capacity and distribution facilities needed to convey recycled water into Downtown. As described in Section 2.3, major recycled distribution lines have been proposed for extension into the Downtown, but it is unknown when water would actually become available. As a result, the water use estimates presented above assume that all future demand would be met by the potable supply and distribution system.

The City's projected recycling-related reductions in potable demand would only be achieved on commercial/industrial or institutional landscaping, since there are currently no plans to provide recycled water for residential use. To help capture some of the potential water savings within this sector, the City in 2011 adopted an amendment to Municipal Code Chapter 6, Article 5, Section 6-520, which discourages outdoor water use through mandatory watering schedules, restrictions on the installation of turf and lawns, and fines for water wastage. It is assumed this ordinance, which is applicable to all customers served water by the City of Fresno and is in effect year round, will help reduce the volume of water used for irrigation purposes throughout the City, even where recycled water is not available.

In addition to these efforts to reduce irrigation demand, the 2008 UWMP included a number of recommendations designed to reduce per capita water usage. With implementation of these recommendations, per capita demand

(encompassing all water use in the city, not just in the home) is projected to decline in a series of steps by a total of 19%, from 300 gallons of water per person per day in 2007 to 243 gallons per person per day in 2020. Much of this reduction will be accomplished through installation of meters for all single family homes (all other services are currently metered), resulting in a gradual increase in conservation by all water users. According to the 2008 UWMP, nearly 85% of all accounts were still unmetered, accounting for roughly 60% of total water use, so transition to the lower demands typically associated with metered versus unmetered services is anticipated to provide the largest share of the projected reduction in City-wide per capita demand. These reductions would likely be more significant in the area of the DCNP than within the urban core covered by the FCSP, because so much of the Community Plan consists of existing single family housing. Meters tend to encourage reductions in indoor water use, but the largest benefit typically comes through the disincentive meters create for excessive landscape irrigation. Irrigation generally accounts for a high percentage of residential water use throughout the Central Valley, so installation of meters should provide a strong complement for the Municipal Code restrictions described in the previous paragraph.

In February, 2011, the City Council renewed its commitment to the meter installation goal by adopting Resolution No. 2011-17, which appropriated funds to continue the effort. Current plans call for all residential services to be metered by 2013. Completion of this program, plus realization of the water savings resulting from the additional conservation measures described in the 2008 UWMP, should help offset what would otherwise be a greater increase in total water use caused by general population growth and by densification in the Downtown Area

It is noted the anticipated effect of Municipal Code restrictions, other conservation measures, and particularly the meter installation program, is reflected in the demand rates used in the 2008 UWMP. It assumed there would be an overall 5 percent reduction in demand between 2005 and 2010, across all customer classes, and a 10 percent reduction for single family homes between 2010 and 2025, as the meter installation program reaches all parts of the City. As a result, the water savings described in this section have been incorporated into the demands calculated in Section 2.1.3.2 for already developed parcels. These demands do not, however, include the additional 10 percent reduction in per capita demand (to the previously cited 243 gpcd) the UWMP recommends the City achieve by the year 2020 to help extend the adequacy of its currently identified water supplies.

2.1.4.3 Design Outcomes

Based on the plan assumptions and conditions presented in Moule & Polyzoides' April, 2011 Development Potential Technical Memo, the replacement of existing pipes, the installation of new pipes, and the provision of additional storage, as described in Section 2.1.4.2 and shown on Figure 2.3 of Appendix 2, would be adequate to meet the anticipated increase in future potable water demand and fire flow requirements within the Fulton Corridor Specific Plan Area. In addition, the Fresno DPU expects that planned upgrades to the existing distribution system that serves the Downtown Neighborhoods Community Plan Area, with minor modifications, will allow it to also meet all future condition demands. It is noted, though, that the future use of recycled water has not been incorporated into any of the demand projections, so if the necessary distribution facilities are extended into Downtown in accordance with current plans, both total potable water use and peak demands could be lower than estimated in this report.

2.2 Sanitary Sewer/ Wastewater Treatment

Population growth and increased commercial activity will increase wastewater generation within the FCSP and the DNCP. The following analysis of sanitary sewer/wastewater treatment systems includes calculations made to estimate the volume of this increase and to identify the improvements needed to accommodate the resulting higher wastewater flows. As noted below, these calculations are largely based on information presented in the City's 2006 Wastewater Collection System Master Plan (WCSMP), prepared by Brown and Caldwell Engineers.

2.2.1 Existing Conditions

2.2.1.1 Wastewater Treatment

As a condition of a Clean Water Grant issued by the Federal government, the City of Fresno was designated the Regional Sewer Agency for the Fresno-Clovis Metropolitan Area (FCMA) in 1966. The City currently operates the Fresno/Clovis Regional Wastewater Reclamation Facility (RWRF) under a Joint Powers Agreement with Clovis and the County of Fresno. The 3000-acre RWRF was originally constructed in 1947, and is located inside the City limits but within a non-contiguous area situated about 3.5 miles southwest of the Chandler Executive Airport. Over the past 65 years, the RWRF has been expanded and rehabilitated several times; most recently in 2010when process units were added to the facility to address high organic concentrations within incoming wastewater. The treatment plant includes a number of redundant facilities that allow for regular maintenance and provide backup capacity in the event of equipment failure.

In the Public Facilities Element of the 2025 Fresno General Plan, it was estimated the current FCMA population of 482,000 would increase to 790,000 by the year 2025. Multiplying this population estimate times a net wastewater generation factor of 110 gallons per capita per day indicates Fresno and the areas it serves will require a base treatment capacity of approximately 87 MGD in 2025.[22]

---

[22] This generation factor was obtained by dividing the total volume of all wastewater produced in the City, by residents, businesses and institutions, by the total service area population, thereby allocating wastewater generation solely on the basis of population. The factor is an estimated value provided by representatives of the Fresno DPU, based on recent measurements of average flow rates at the wastewater treatment plant. Note it is approximately 15 percent lower than the per capita generation factor used in the 2025 General Plan, but it was decided this lower factor provides a more accurate reflection of future conditions, since it accounts for the reductions in per capita water use currently being envisioned in the City's water supply studies.

While the City supports maintaining the RWRF as the area's principle wastewater treatment facility, sub-regional facilities could potentially help accommodate the growth outlined in the 2025 General Plan. In 2001, the City completed a subregional satellite wastewater treatment plant study, which concluded an 8 MGD satellite plant would be needed to serve the North Growth Area, and a 24 MGD plant would be needed for the southeast quadrant of the City. This latter plant was designed to serve growing areas in both the City of Fresno and the City of Clovis, but, since completion of the study, Clovis has decided to construct its own phased 8.4 MGD treatment plant to treat flows in excess of its RWRF capacity allocation. At this time, Fresno is still considering construction of the Southeast satellite plant, with a reduced capacity that would include an allowance to account for possible future flows from Clovis.[23] It is noted that neither of the planned satellite treatment plants would serve the FCSP or the DNCP. All wastewater generated within these areas will continue to be treated at the RWRF.

2.2.1.2 Wastewater Collection System

In addition to operating the RWRF, Fresno owns and maintains the wastewater collection system for the City and for the following agencies that are also served by the RWRF: County of Fresno, Pinedale Public Utility District, and Pinedale County Water District. Additionally, the City owns and maintains the sewer trunk system that serves the City of Clovis. In total, the City's wastewater collection system consists of:

- 23,000 manholes
- 15 lift stations
- Nearly 2 miles of force mains
- 54 junction structures, and
- Approximately 1,500 miles of gravity sewer pipes ranging from 6" to 84" in diameter.

Based on its 2006 Wastewater Collection System Master Plan, the City has established an on-going program to address operational challenges found throughout its collection system. These include aging facilities, incomplete coverage of the service area, a lack of capacity and, most notably, corrosion of concrete sewers caused by high sulfide levels in the wastewater stream. The

[23] WCSMP, Chapter 1.

improvement projects designed to address these problems can be divided into the following categories:

- *Infill* to reach currently unserved areas
- *Replacement* of failed or undersized lines
- *Rehabilitation* of corroded or otherwise deteriorated lines
- *Relief Sewers* to provide additional peak flow capacity

Some of these improvement projects have already been completed or are underway. The existing sewer system is shown in Figure 2.4 (Appendix 2)

2.2.2 Proposed Conditions

The Fulton Corridor Specific Plan and the Downtown Neighborhoods Community Plan propose a modest transfer of density from the DNCP to the FCSP, as compared with the 2025 General Plan. This transfer would modify the previously envisioned distribution of wastewater generation by residents and businesses throughout the Downtown Area. Under either planning scenario, though, (the proposed plans or the 2025 General Plan) wastewater generation will increase as growth occurs over the next 25 years.

For the purposes of this wastewater analysis, it was assumed growth within the two Plan Areas will occur as described in Section 2.1.2, on currently vacant or underutilized parcels. As shown in detail in Table1.1 of Appendix 1, this will result in a maximum of 6,291 new or reoccupied dwelling units and 6.5 million square feet of new or repurposed commercial/industrial space within the FCSP. At an assumed density of 1.9 persons per dwelling unit, there will be almost 13,600 more residents at maximum build-out of the Plan Area than there were in 2010.[24]

In the DNCP, by contrast, it was not assumed there are any unused residences or commercial/industrial spaces that will be occupied in the future, so all growth will occur as new development of currently vacant properties. According to the DNCP development program, build-out will produce a maximum of 3,697 new dwelling units and 5.3 million square feet of new commercial/industrial space (see Table 1.2, Appendix 1). At this area's higher assumed density of 4.13 persons per dwelling unit, the resident population is projected to grow by approximately 15,300 people by the year 2035.

[24] The estimated population includes reuse of 860 existing dwelling units that are currently unused, which would increase the total number of new residential units to 7151 at maximum buildout.

2.2.3 Wastewater Volume Analysis and Results

2.2.3.1 Specific Plan

Existing Wastewater Generation

Existing Average Dry Weather Flows (ADWF) within the Specific Plan Area were estimated by assigning each parcel in the FCSP to one of the land use classifications established for the UWMP and used in the previous section's water analysis. An estimated wastewater generation rate, equal to approximately 83 percent of total existing condition water use for each classification, was then multiplied times the measured parcel area to calculate an existing wastewater flow.[25] The resulting flows were summed by collection area to obtain the ADWF for each contributing sewershed, and the collection areas were summed to obtain a total for the entire FCSP. To estimate the peak flow rates that are used to determine the capacity needed for pipes and other collection facilities, the ADWF was multiplied by dry weather peaking factor of 1.49 used in the Wastewater Collection System Master Plan (WCSMP) to account for fluctuations in wastewater flow over the course of a year, and then increased by 10,000 gpd per acre to account for the combined effects of infiltration and inflow (jointly referred to as I&I).[26]

This analysis indicates the existing average dry weather wastewater flow in the FCSP is 0.568 mgd, peak dry weather flow is 0.846 mgd, and peak wet weather flow is 4.41 mgd, as shown Table 2.8 in Appendix 2. The existing wastewater collection system within the Specific Plan Area is shown in Figure 2.5.

---

[25] These generation rates are approximately one third lower than those used in the WCSMP, but comments provided by Steve Hogg with DPU (DATE) indicate the City is seeing indications of lower flow than the WCSMP figures would suggest. As a result, and to ensure consistency with the water analysis, it is assumed that existing wastewater generation rates are a function of water use as estimated in the UWMP.

[26] The WCSMP classifies I&I as groundwater-dependent or rainfall-dependent. It concluded there is no groundwater infiltration owing to its depth below the surface (typically at least 30 feet), but the age and condition of the collection system result in significant rainfall infiltration. This occurs when percolated rainfall seeps into pipe joints and manholes, and when unapproved storm drain connections discharge directly to the wastewater collection system. According to the WCSMP, the existing City-wide I&I rate is 500 gpd/acre, but flow metering indicates it may be as high as 10,000 gpd per acre throughout the Downtown area, suggesting the widespread existence of unapproved connections.

Future Wastewater Generation

As described in the Water Supply Section, estimates of future wastewater flow within the downtown study areas are based on the square footage of development that can be achieved on each vacant or underutilized parcel, rather than on the area of the parcel itself, while actual rates of wastewater generation were taken from a comparable mixed use, urban neighborhood. These rates were averaged within each development zone to account for the anticipated mix of land uses shown in Table 1.1, and then applied uniformly throughout the zone to each parcel's development area. Calculations were performed to estimate total wastewater flows under both the Maximum and Minimum FAR conditions. These flows were then increased by the same factor used for existing developed properties to obtain peak dry weather flow, and I/I was added at the rate of 1,500 gpd/ac (as specified by the WCSMP for new Downtown development) to arrive at a peak wet weather flow generated by each parcel.[27] These flows were then added to those previously calculated for already developed parcels to arrive at a total for each collection area and for the entire Specific Plan Area, as shown in Table 2.8 of Appendix 2.

Based on this analysis, average dry weather flows would increase by approximately 2.2 MGD, to 2.76 mgd at maximum build-out, and peak dry weather flows would increase by 3.27 MGD to 4.12 mgd. Peak wet weather flows would increase by a lesser amount, though, since it is anticipated the elimination of illegal storm drain connections on redeveloped parcels would reduce I&I by approximately 0.56 MGD, resulting in a total flow of 7.13 mgd. These projected changes in wastewater flows within the FNSP are shown in Table 2.9 and illustrated on a per parcel basis in Figure 2.5 of Appendix 2.

The projected increase in average dry weather flows, which are significant in gauging required treatment capacity, would result from the densification anticipated to occur as the Downtown is built-out to the levels envisioned in the proposed Specific Plan. As noted in the Water Section, though, the amount of development the plan would permit is not substantially different from what could occur under the 2025 General Plan, so little change is anticipated in overall

[27] Because existing I&I rates are so high in the Downtown, the WCSMP recommended reducing peak wet weather flows by repairing leaky sewers and removing unapproved storm drain connections (in areas with lower I&I rates, it is usually more cost effective to simply accommodate I&I in the design of the collection and treatment systems). The Master Plan estimated the City could achieve a net rate of 1500 gpd per acre through an I&I prevention program, so this value was used in the estimation of peak wet weather flows from redeveloped parcels.

wastewater flow. However, because the FCSP would change the distribution of this development, it would have different impacts on the existing collection system. To evaluate these differences, the results of this flow analysis were provided to the City of Fresno for use in their wastewater system model, as described in a following section.

2.2.3.2 Community Plan

Actual wastewater flow calculations were not prepared for the DNCP, but the growth scenario proposed under the plan has been reviewed by the City, which concluded that the amount and distribution of densification, and its anticipated effect on total flows, is generally consistent with what would be allowed under the 2025 General Plan.[28] As a result, implementation of the DNCP would not result in a need for mainline upgrades or additional treatment capacity above what is already planned, although some localized segments of the existing collection system could require upgrades that had not been previously anticipated.

2.2.4 Collection System Analysis

To evaluate the impact of build-out in accordance with the FCSP on the existing Downtown collection system, the Fresno Department of Public Utilities performed a capacity analysis on the existing collection system using a version of the flow data presented in this report.[29] This analysis identified five potentially deficient pipe segments totaling 4740 feet in length, and ranging in size from 8 inches to 27 inches in diameter. Upgrades in all cases would be to the next pipe size, two or three inches in diameter larger. (These segments are shown on Figure 2.6, Appendix 2). According to the DPU, these results are only preliminary, and decisions on the need for and/or the size of any upgrades would be made as development progresses and requirements for additional

---

[28] Doug Hecker, Supervising Engineering Technician, City of Fresno Department of Public Utilities, December 12, 2011

[29] *Sewer Capacity Study of Fulton Corridor Specific Plan Project Area*, City of Fresno Department of Public Utilities, July 15, 2011. A copy of this report is attached as Appendix 7. Note it is assumed this analysis is conservative, and thus preliminary, because it used peak wet weather flow rates that were approximately 10 percent higher than the results presented in Table 2.8. This difference primarily resulted from assumptions regarding the rate at which existing I&I conditions would be corrected as the plan area redevelops. Although the resulting rates were eventually determined to be unrealistically high, the DPU did not rerun its sewer model with the lower flow rates, so the list of needed upgrades it identified is considered to represent the upper limit of improvements that might ultimately be required.

capacity are better defined. This is because the modeling was based on build-out throughout the FCSP to the maximum permitted FAR, which may not occur in all areas.

The FCSP is served by six different trunk sewers that convey wastewater from different parts of the City through the Plan Area to the RWRF. The DPU capacity analysis did not identify any future project-related deficiencies in any of these large diameter sewer lines.

A capacity analysis was not performed for the DNCP, since, as described above, future wastewater flow rates were not determined. However, the densification review performed by the DPU identified three areas where higher concentrations of housing and commercial development could potentially result in wastewater flows that exceed previous estimates made for the Downtown area. As a result, the City expects it will pay particular attention to these areas and their resulting wastewater collection requirements as the neighborhood continues to build out.

2.3 Recycled Water

Future development within both the FCSP and the DNCP present opportunities for increased use of recycled water for landscape irrigation. However, this analysis is confined to the FCSP, because it is anticipated this area will see more of the large scale street improvements that make installation of a recycled water distribution system more cost effective. Consequently, although there may be substantial recycled water use throughout the DNCP in the future, these potential demands will not be evaluated at this time.

2.3.1 Existing Conditions

Except for incidental and evaporative losses, the total volume of treated wastewater effluent produced at the RWRF is currently used to irrigate farmland or is discharged to large percolation basins to help recharge the local groundwater aquifer. This allows the City to increase its groundwater pumping by an amount equal to the volume percolated, but the "excess" groundwater obtained in this way (excess above the level permitted under goals set forth in the Fresno Area Regional Groundwater Management Plan) is discharged into FID canals for delivery to FID's agricultural customers. Because this groundwater replaces a similar volume of surface water that FID contractors would otherwise use for irrigation, the City receives a surface water credit from FID for 46 percent of the water it pumps into the canals under the terms of the agencies' Wastewater Recycle Exchange Agreement, up to a maximum of 13,800 acre feet per year. Surface water obtained under this agreement is treated at the City's Surface Water Treatment Facility along with its other surface supplies, and pumped into the potable distribution system.[30]

To help reduce its use of limited potable water supplies and control groundwater contamination associated with percolation disposal, the City plans to begin using treated effluent from the RWRF for landscape irrigation and other approved uses by 2025. This would require upgrading at least a portion of the RWRF's treatment facilities to produce the tertiary quality effluent required for unrestricted use on publically accessible landscape. It is now estimated the use of recycled water will total 25,000 afy by 2025, with a high concentration in the Southeast Growth Area, where the necessary distribution infrastructure can be installed as the area is developed.[31] Other areas are also being considered, though, including additional undeveloped growth areas and portions of the

[30] City of Fresno, Urban Water Management Plan, August, 2008, page 4-5.
[31] City of Fresno, Urban Water Management Plan, August, 2008, page 4-19.

existing City where large uses that include landscape irrigation, industrial processes and dual plumbing systems in large buildings can be most efficiently served. [32]

Preliminary plans set forth in the City's Recycled Water Master Plan (RWMP)[33] and Ordinance: Notice of Preparation and Initial Study (ESA, May, 2010) show an extensive recycled water distribution system that will primarily serve northern areas of the City along the San Joaquin River and southern areas primarily located south of Highway 180. In the southwest quadrant of this southern system, coverage would be extensive in the industrial portions of the DNCP located west of Highway 99 and also along the western side of the FCSP. The RWMP included no information on potential uses for this water, so it offered no information regarding the amount of existing or future potable water use that could be offset with recycled water within these areas. However, projections of the volume of recycled demand within the FCSP prepared for this report are presented in a following section.

Although the recycled distribution system described in the RWMP is predicated on the use of effluent from the RWRF, an alternative included in the Master Plan proposes the construction of as many as four satellite reclamation facilities throughout the City. These smaller plants would be similar to the ones discussed in the Wastewater Section, and would substantially reduce the need to move both untreated and treated wastewater long distances before reuse. At this time, the City has not finalized plans for developing its recycling treatment and distribution infrastructure, but City staff has been developing an ordinance that would potentially require various types of properties to use recycled water for approved uses (in accordance with State Division of Health Services requirements) when it becomes available. The City Council has yet to consider such requirements, but it is noted that establishing these mandates in advance of when the system can actually deliver recycled water would allow property owners and developers to incorporate the necessary infrastructure into their building plans so they are ready to use the water once it becomes available.

The planned recycling at the RWRF and/or satellite plants would be in addition to an existing irrigation use of tertiary treated effluent from a City owned and operated water recycling facility in North Fresno, which was constructed to serve

---

[32] 2008 UWMP, Chapter 10.

[33] City of Fresno Recycled Water Master Plan and Ordinance: Notice of Preparation and Initial Study, Environmental Science Associates, May, 2010.

the Copper River Ranch. The output from this plant, proposed to be approximately 1250 afy at build-out of the development, could be used to irrigate the project's golf course and other landscaped areas in the vicinity. The amount of effluent used for golf course irrigation would replace a supply that now mainly consists of surface water from FID, which would free up an equivalent volume for alternate potable uses throughout the Fresno area.

2.3.2 Estimated Recycling Potential

The RWMP identified a number of different land uses where recycled water could be used for irrigation. Several of these, including schools, existing city-owned parcels, and parks proposed as part of the open space plan, are located within the FCSP boundary. In addition, the Specific Plan calls for the development of streetscapes with extensive plantings. Rough estimates of the potential irrigated areas associated with these land uses indicate there would be 32.9 acres around schools and parks, 34.5 acres of open space, and 8.4 acres of street right of way. This represents a total of about 76 acres that could be irrigated with recycled water within the built-out FCSP. These areas are shown graphically on Figures 2.7 and 2.8 (Appendix 2).

Note that for the purposes of this analysis, no estimate is made of other recycling opportunities, which can include industrial processes and toilet flushing in commercial buildings and high density residential projects. If extended to these potential uses in the future, the use of recycled water within the FCSP could be substantially higher than estimated in this report.

2.3.3 Recycled Water Demand and Distribution

Irrigation demand was estimated for the areas described above by subtracting average rainfall from the reference evapotranspiration rate for each month. It was assumed that all areas would be planted with ornamental grasses, which have a relatively high demand factor of 0.88, so the need for water would be only about 10 percent lower than the actual evapotranspiration rate minus rainfall. Applying this factor to a total irrigated area of 76 acres results in an average annual demand of 3,188 acre-feet, most of which would be applied between the months of March and November (rainfall would typically eliminate the need for irrigation during the winter months)

At this time, the 25,000 afy of recycled water the City plans to be distributing by the year 2025 has not been allocated to specific uses, but it appears utilization of

the volume calculated above for the FCSP could be easily accommodated by the available supply (although some reallocation away from the Southeast Growth Area may be required). It is noted, though, that unless a satellite treatment plant is located in the Downtown Area, the future use of recycled water within the FCSP will depend on when the RWRF recycled distribution system is extended into the project vicinity. In addition, because the City has not committed to the construction of a satellite plant in the FCSP or anywhere else, it can only be assumed at this time that all recycled water would be produced at the RWRF.

A preliminary layout of the distribution system needed to deliver recycled water to the identified opportunity sites is shown in Figure 2.7 (Appendix 2). It is tied into the backbone transmission system described in the RWMP, although the Figure also shows a potential site for a satellite treatment plant, located immediately east of the Specific Plan boundary, in the vicinity of Fresno City Hall and adjacent to the Fresno Water Tower.

3. Stormwater Management

The Fresno Metropolitan Flood Control District (FMFCD or the District) is responsible for managing urban stormwater runoff in the Fresno metropolitan area. The District boundary is located in the north-central portion of Fresno County, between the San Joaquin River and the Kings River, and FMFCD is authorized to control stormwater within a combined urban and rural watershed of approximately 400 square miles. The watershed extends eastward into the Sierra Nevada foothills to an elevation of approximately 4,500 feet above sea level, covering an area collectively referred to as the Fresno County Stream Group.

The main purpose of this section is to determine impacts to the existing stormwater infrastructure system based on the proposed plans are expected and discuss necessary infrastructure upgrades.

3.1 Existing Conditions

Stormwater collection in the project area begins in the street gutters that convey runoff to existing storm drain inlets and the underground stormdrain conveyance infrastructure. The gutters, as well as all public streets and sidewalks, are maintained by the City of Fresno Street Maintenance Division, which is responsible for keeping these surface storm drain facilities operating efficiently. The FMFCD stormwater system begins at the storm drain inlets and includes all downstream drainage facilities, including the underground pipes and pump stations that convey runoff to District-owned infiltration basins, which dispose of most annual runoff through percolation into the underlying groundwater table. The existing drainage system is shown in Figure 3.1 in Appendix 3. When storms generate larger volumes of runoff than these basins can handle, it overflows into a network of relief channels that discharge to the San Joaquin River, its tributary streams or local agricultural canals. The runoff from the FCSP Area is routed to infiltration basins to the west of the plan area where it is infiltrated into the groundwater table.

Within the City of Fresno, FMFCD's Storm Drain Master Plan divides the District into local drainage areas of one to two square miles. All inlets, pipes and pumping stations within each drainage area are maintained by the District; except for those located in the Fulton Mall within the FCSP Area, which are currently maintained for the District by the City under a system of work

authorizations. It is assumed that this maintenance arrangement will remain in place for the foreseeable future and the City will continue to maintain that portion of the Plan Area's storm drain infrastructure throughout the life of the FCSP and DNCP.

There are two areas within the Specific Plan Area that currently lack complete or adequate storm drain infrastructure. This makes them prone to localized flooding that inconveniences residents, potentially resulting in lower property values and higher insurance costs for both homeowners and businesses. These areas have not historically generated sufficient tax revenue to fund the construction of modern drainage facilities, so a number of storm drain improvements are now being constructed with funding provided by the American Recovery and Reinvestment Act (ARRA). One of these projects is located on Divisadero Street, adjacent to an approximately twelve block area with no storm drain facilities that extends south from Divisadero into the Plan Area. Although these improvements would provide little immediate relief for this neighborhood, they would make it feasible to relieve existing flooding conditions by extending this system in the future.

The second area, totaling about 50 acres and located in the south corner of the Specific Plan Area, lacks an existing storm drain network. No facilities are currently planned for this area, but it is assumed that storm drains will eventually be needed to support the scale and character of redevelopment being considered. It is anticipated that these new facilities would be constructed at the time of future redevelopment and be connected to the major storm drain lines that now serve the central portion of the Specific Plan Area or to the lines that serve the neighborhood located immediately north of Divisadero Street. Although there are no indications of significant drainage problems within the areas now served by these facilities, shallow, nuisance flooding has been reported after heavy rains, leaving standing water that has damaged pavement and inconvenienced both drivers and pedestrians.

3.2 Proposed Conditions

Specific Plan Area: The intention of the Specific Plan is to continue to use the drainage conveyance infrastructure that is owned and operated by the District. Redevelopment of the Specific Plan area is focused first and foremost on underutilized parcels. This focus on underutilized parcels, coupled with an

increase in civic open space and a focus on low impact development solutions, is intended to lower the imperviousness of the FCSP Area.

Community Plan Area: The Community Plan proposes to move densification away from the corridors themselves, as is proposed in the General Plan, and into the surrounding neighborhoods. This densification includes one and two story multi-family residential development on vacant and under-utilized parcels. More detailed analysis regarding this shift in density can be found in the downtown Neighborhoods Community Plan.

3.3. Storm Water Quantity and Quality Analysis and Results

3.3.1 Methodology

Specific Plan- The amount of impervious surface in a watershed is the principal determinant of both the peak rate and total volume of stormwater runoff. Peak rates of stormwater runoff are calculated in the City of Fresno using the Rational Method, which can be applied to both undeveloped and developed watersheds. The method is based on the use of runoff coefficients, which represent an estimate of the percentage of total rainfall expected to end up as runoff (ie. a coefficient of 0.3 equals 30% runoff). For each subarea of a watershed, the runoff coefficient is multiplied by the number of acres within the contributing drainage area and by the expected peak rainfall intensity (expressed in inches per hour) to calculate the peak rate of storm water runoff (expressed as cubic feet per second). This relationship is expressed in the following equation:

Peak Runoff = Runoff Coefficient x Drainage Area x Rainfall Intensity

or: Q (cfs) = C x A (acres) x I (inches/hour)

It is noted that in watersheds with mixed uses (such as the Downtown Area), the runoff coefficient represents a weighted average of the coefficients assigned to each land use.

Since Rainfall Intensity is a function of site location and local climate, it will remain constant for both the existing and proposed conditions. Consequently, a comparison of the product of the Area and Coefficient variables under existing and proposed conditions is sufficient to determine how the proposed development will affect peak rates of stormwater runoff, and whether some associated mitigation would be necessary. For this analysis runoff coefficients were assumed to remain constant within a given land use type, though based on the landscape design intent of the Specific Plan, proposed development is likely to increase the permeability of the ground cover, resulting in lower runoff

coefficients. The landscape design intent focuses on increased vegetated streetscape elements and the integration of landscape-based stormwater management features into new development projects

The existing condition was provided by the Flood Control District and is included in the Results discussion below. Area calculations for proposed land uses by zone as per the FCSP were performed. A coefficient of runoff was assigned to each land use type within the zones. A weighted runoff coefficient was then calculated for each zone and correspondingly for the entire FCSP Area.

The existing and proposed runoff coefficients used for this analysis are:

Residential = 0.75 (as estimated by Sherwood Design Engineers)
Commercial = 0.8 (as provided by Flood Control),
Industrial = 0.75 (as provided by Flood Control)
Open Space = 0.40 (as estimated by Sherwood Design Engineers)

The percentage of each land use type for the proposed and existing conditions are shown in Tables 3.1 and 3.2 for the Specific Plan Area.

Community Plan- The methodology for determining potential changes in stormwater runoff rates within the Community Plan area involves a comparison of the two primary land use types within the plan area. These are the conditions along the corridors and within the adjacent residential neighborhoods. By discussing the changes to lot coverage patterns within the corridors and then separately within the neighborhoods a qualitative analysis will be performed.

3.3.2 Results

Specific Plan- A comparison of the proposed land uses under the two sets of conditions shows there would be little change in total coverage by impervious surfaces, and the total Area/Coefficient product would actually decline by a small amount (from 0.78 to 0.74). Since the amount of impervious surface in a watershed is the principal determinant of both the peak rate and total volume of stormwater runoff, this indicates there would be little difference between build-out under the proposed plan and build-out under the existing condition. As a result, it is anticipated that stormwater management strategies currently in place,

which the Fresno Metopolitan Flood Control District considers to be satisfactory,[34] would also be sufficient for development under the proposed FCSP.

This assessment is supported by Ms Denise Wade of the Fresno Metropolitan Flood District based on a preliminary review of the Specific Plan Area development proposal. She determined that, upon initial inspection, existing land uses are comparable to the proposed changes within the proposed Specific Plan, and she did not expect to see significant impacts to the existing system.[35] In the event more intense land uses result in higher estimated rates of stormwater discharge, then mitigations, such as construction of parallel pipelines to increase capacity and/or on-site water retention methods (surface ponds or underground storage pipelines, could be required. In addition, should the project change existing street drainage patterns and/or pipeline alignments, typically a review would be performed to determine how the system is impacted and whether additional pipelines and/or inlets would be required. In accordance with standard Flood Control District policy, it is generally the responsibility of developers to fund improvements to the District's system that are needed to address impacts associated with their projects.

Community Plan- The primary difference in land use between the existing Municipal Code and the proposed DNCP is a shift in residential density from the corridors into the surrounding neighborhoods. Whereas the Municipal Code included a higher density of residential uses along the corridors, the proposed DNCP maintains the corridors as primarily commercial centers.

Based on a comparison of required setbacks under the current Municipal Code and as set forth for each zoning district under the proposed Community Plan, it was determined that setbacks would decrease primarily in the following proposed areas: Corridor General Zones, Neighborhood Center Zones, and a few of the Neighborhood General Zones. Although a decrease in setback would indicate a potential for an overall increase in impervious area of these zones, examination of current conditions within the DCNP through aerial photographs (see Appendix 3, Figure 3.2) shows that a large percentage of the existing setbacks within the proposed Neighborhood zones is currently covered by

---

[34] Denise Wade, Staff Engineer, Master Planning & Special Projects Department, Fresno Metropolitan Flood Control District, personal communications, November and December, 2011.

[35] Email correspondence on 11/2/2010 with Denise Wade using Figure 3.3 and 3.4 in Appendix 3 as reference for determination.

impervious surfaces such as access driveways and parking lots. Consequently, little change in the amount of impervious cover is anticipated in these zones. Additionally, since there would be fewer multi-story residential buildings, there would be less need for large new areas of surface parking along the major street corridors under the DNCP. Within the DNCP's remaining zones, setbacks would either increase slightly or remain largely consistent with the existing Municipal Code and existing patterns of development.

In addition to setback conditions, it is noted the DNCP projects there would be almost 600 fewer housing units at build-out than under the current Municipal Code (3,697 units versus 4,283 units). This reduction in density would mainly occur by shifting development away from the major street corridors and into multi-family units within the surrounding neighborhoods. As described above, this would lessen the need for new surface parking, because a surplus of on-street parking spaces already exists on neighborhood streets. As a result it is assumed that there would be little difference in overall impervious area, and thus total runoff, under the Municipal Code and under the DNCP.

Because these conclusions regarding impervious cover and total runoff are preliminary, Denise Wade's previously cited comments regarding the need for additional review as development proceeds and the possibility that mitigation measures might be required would also apply throughout the DNCP. However, if development occurs in accordance with the assumptions set forth in the DNCP and in this report, it remains likely that few changes to the area's existing storm drain infrastructure would be required as the neighborhood continues to build out.

3.4 Infrastructure Improvements

Although it was determined that neither the Specific Plan nor the Community Plan would result in a net increase in stormwater runoff to the District's facilities, both the Specific and Community Plans include recommendations for the implementation of Low Impact Development (LID) stormwater management facilities. LID focuses on minimizing impervious surfaces, improving the quality of stormwater runoff, and reducing impacts to our natural waterways. The use of LID stormwater management will enhance the existing infrastructure network of the FMFCD and reduce localized flooding, improve water quality, provide community amenities, and enhance aquifer recharge throughout the City. The primary goal of the stormwater management approach outlined within these plans is to improve the quality and quantity of water infiltrated into the local

groundwater supply and decrease flows to the District's system. Within the Specific Plan, implementation locations and conceptual designs are detailed to help ensure future integration of LID design into improvement projects.

Table 3.3 in Appendix 3 describes the most relevant and practical types of Low Impact Development (LID) strategies. Tables 3.4-3.7 in Appendix 3 show where these LID strategies can be introduced whenever right-of-way improvements are made within the Specific Plan Area.

Appendix 1: Background Information

Figure 1: Location of DNCP and FCSP within the City of Fresno

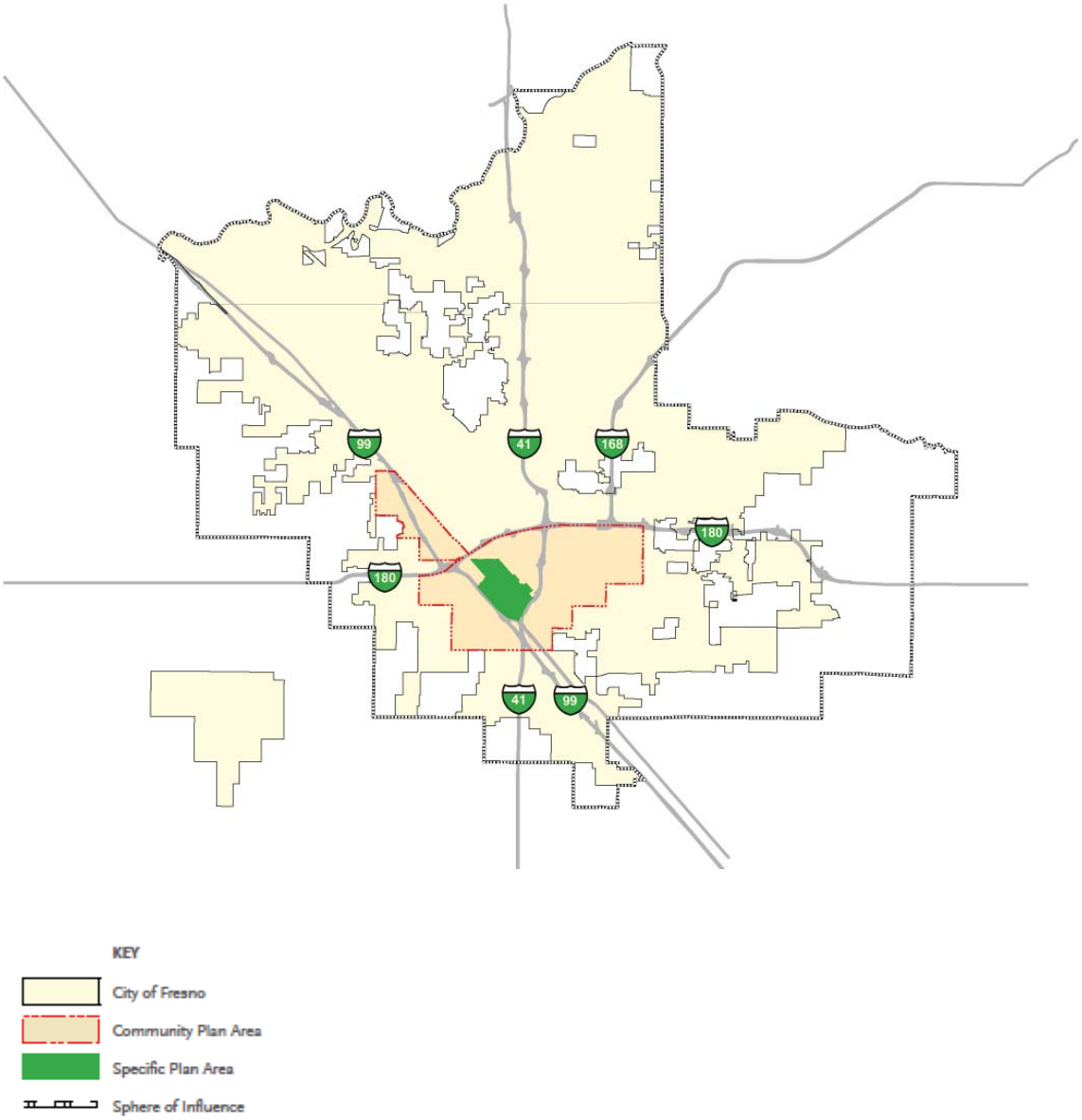
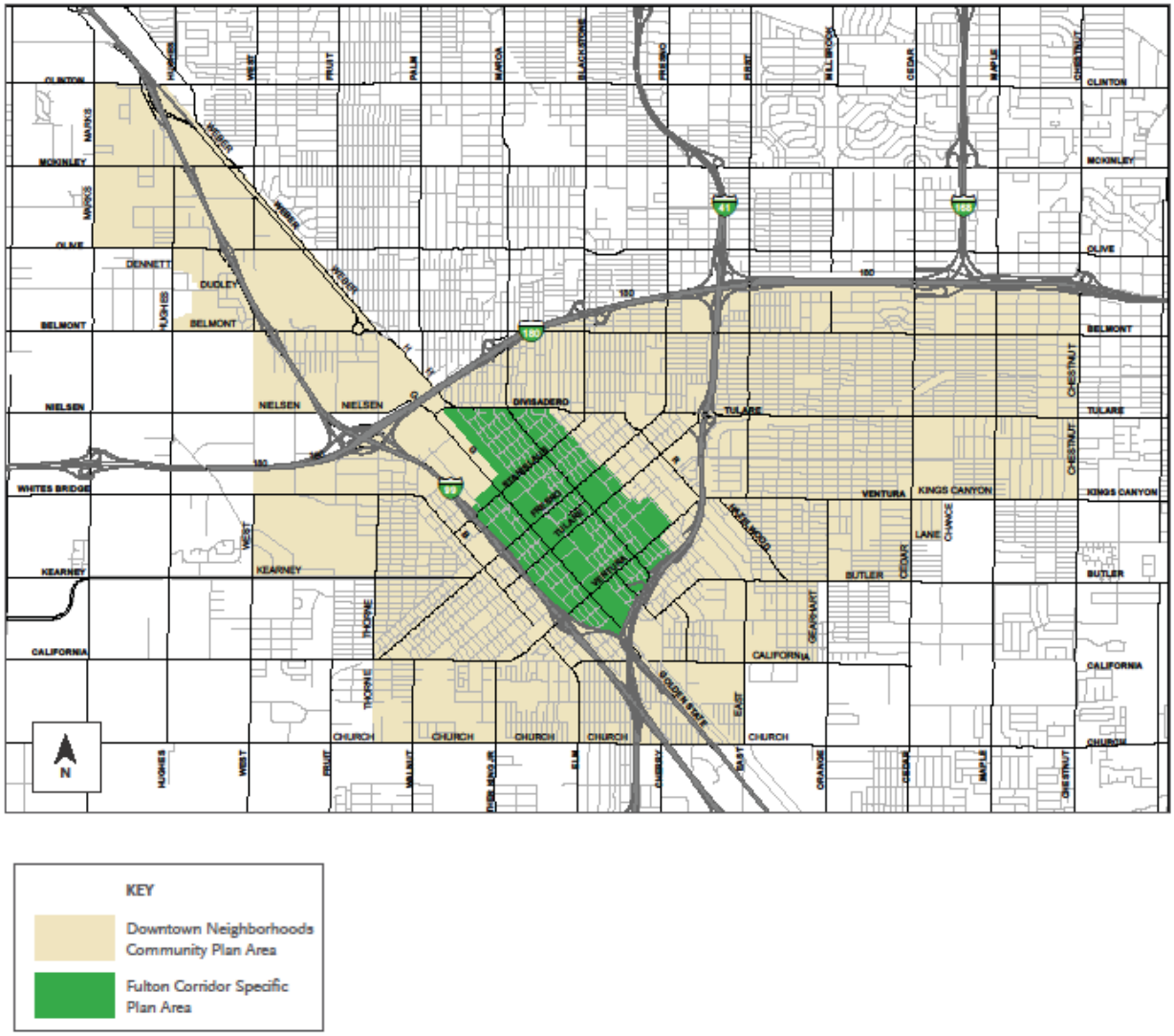


Figure 2: DNCP and FCSP Boundaries



KEY

Downtown Neighborhoods Community Plan Area

Fulton Corridor Specific Plan Area

Table 1.1 Specific Plan Development Program- By Land Use Zone

DEVELOPMENT POTENTIAL: MAXIMUM FAR

Zone	Total Area of Underutilized Parcels (sf)	Avg FAR	Total Buildable SF	Residential			Office		Retail		Industrial	
				%	SF	Units	%	SF	%	SF	%	SF
CBD 1	1,074,233	6.1	6,542,377	45%	2,944,070	2,453	40%	2,616,951	15%	981,357	0%	0
CBD 2	1,405,881	2.4	3,354,417	65%	2,180,371	1,817	25%	838,604	10%	335,442	0%	0
Civic Center	0	0.0	0	0%	0	0	75%	0	25%	0	0%	0
Chinatown District	572,087	1.4	808,590	65%	525,583	438	20%	161,718	15%	121,288	0%	0
Cultural Arts/ South Stadium District	1,315,979	2.0	2,615,326	60%	1,569,196	1,308	20%	523,065	20%	523,065	0%	0
Chinatown Industrial District	272,576	1.5	410,284	%	0	0	25%	102,571	0%	0	75%	307,713
Town Center	0	0.0	0	0%	0	0	75%	0	25%	0	0%	0
Neighborhood General	397,936	0.7	280,795	100%	280,795	234	0%	0		0	0%	0
Neighborhood General Preservation	62,555	0.7	45,975	100%	45,975	38	0%	0	0%	0	0%	0
Special District	61,441	1.1	65,879	5%	3,294	3	5%	3,294	0%	0	90%	59,291
0	0	1.6	0	44%	0	0	29%	0	12%	0	17%	0
TOTALS	5,162,689		14,123,642		7,549,283	6,291		4,246,203		1,961,152		367,004

DEVELOPMENT POTENTIAL: MINIMUM FAR

Zone	Total Area of Vacant Parcels (sf)	Avg FAR	Total Buildable SF	Residential			Office		Retail		Industrial	
				%	SF	Units	%	SF	%	SF	%	SF
CBD 1	1,074,233	1.7	1,840,519	45%	828,234	690	40%	736,208	15%	276,078	0%	0
CBD 2	1,405,881	1.1	1,613,948	65%	1,049,066	874	25%	403,487	10%	161,395	0%	0
Civic Center	0	0.0	0	0%	0	0	75%	0	25%	0	0%	0
Chinatown District	572,087	0.9	506,456	65%	329,196	274	20%	101,291	15%	75,968	0%	0
Cultural Arts/ South Stadium District	1,315,979	1.3	1,008,694	60%	605,216	504	20%	201,739	20%	201,739	0%	0
Chinatown Industrial District	272,576	0.4	101,605	0%	0	0	25%	25,401	0%	0	75%	76,204
Town Center	0	0.0	0	0%	0	0	75%	0	25%	0	0%	0
Neighborhood General	397,936	0.3	117,994	100%	117,994	98	0%	0	0%	0	0%	0
Neighborhood General Preservation	62,555	0.4	24,872	100%	24,872	21	0%	0	0%	0	0%	0
Special District	61,441	0.4	26,339	5%	1,317	1	5%	1,317	0%	0	90%	23,705
0	0	0.7	0	44%	0	0	29%	0	12%	0	17%	0
TOTALS	5,162,689		5,240,428		2,955,896	2,463		1,469,443		715,180		99,909

Table 1.2 Community Plan Development Program - By Land Use Zone

DEVELOPMENT POTENTIAL: MAXIMUM FAR

Zone	Total Area of Underutilized Parcels (sf)	Avg FAR	Total Buildable SF	Residential			Office		Retail		Industrial	
				%	SF	Units	%	SF	%	SF	%	SF
CBD 2	58,701	2.4	143,804	62%	88,861	74	35%	50,836	3%	4,107	0%	0
Cultural Arts/ South Stadium District	58,364	2.1	120,362	63%	75,417	63	31%	37,392	6%	7,553	0%	0
Town Center	115,196	2.8	321,398	48%	155,600	130	42%	133,451	10%	32,347	0%	0
Neighborhood Center	533,019	1.7	923,900	47%	432,707	361	44%	408,649	9%	82,544	0%	0
Corridor General	1,096,031	1.6	1,712,881	10%	169,549	141	80%	1,367,547	10%	175,785	0%	0
Neighborhood General	2,562,248	0.8	2,042,255	100%	2,042,255	1,702	0%	0	0%	0	0%	0
Neighborhood General Revitalization	935,121	0.8	745,344	100%	745,344	621	0%	0	0%	0	0%	0
Neighborhood Edge	1,053,497	0.5	568,511	100%	568,511	474	0%	0	0%	0	0%	0
Special District	2,922,430	1.1	3,133,494	5%	157,430	131	0%	0	2%	48,864	93%	2,927,200
TOTALS	5,162,689		14,123,642		7,549,283	6,291		4,246,203		1,961,152		367,004

DEVELOPMENT POTENTIAL: MINIMUM FAR

Zone	Total Area of Underutilized (SF)	Avg FAR	Total Buildable SF	Residential			Office		Retail		Industrial	
				%	SF	Units	%	SF	%	SF	%	SF
CBD 2	58,701	0.9	52,830	62%	32,646	27	35%	18,676	3%	1,509	0%	0
Cultural Arts/ South Stadium	58,364	0.5	29,182	63%	18,285	15	31%	9,066	6%	1,831	0%	0
Town Center	115,196	0.8	92,157	48%	44,616	37	42%	38,266	10%	9,275	0%	0
Neighborhood Center	533,019	0.4	213,208	47%	99,855	83	44%	94,304	9%	19,049	0%	0
Corridor General	1,096,031	0.4	438,412	10%	43,396	36	80%	350,024	10%	44,992	0%	0
Neighborhood General	2,562,248	0.2	512,450	100%	512,450	427	0%	0	0%	0	0%	0
Neighborhood General Revitalization	935,121	0.2	187,024	100%	187,024	156	0%	0	0%	0	0%	0
Neighborhood Edge	1,053,497	0.1	105,350	100%	105,350	88	0%	0	0%	0	0%	0
Special District	2,922,430	0.3	876,729	5%	44,048	37	0%	0	2%	13,672	93%	819,009
TOTALS	9,334,608		2,507,342		1,087,670	909		510,335		90,328		819,009

Sources: FCSP and DNCP Notice of Preparation received 4/1/12, Report Comparisons.docx received 4/3/12, spreadsheet from Juan Gomez received 4/5/12, correspondence with Juan Gomez regarding updated FARs 4/6/12. Updated back to original FARs per Juan Gomez email regarding FARs 4/9/12

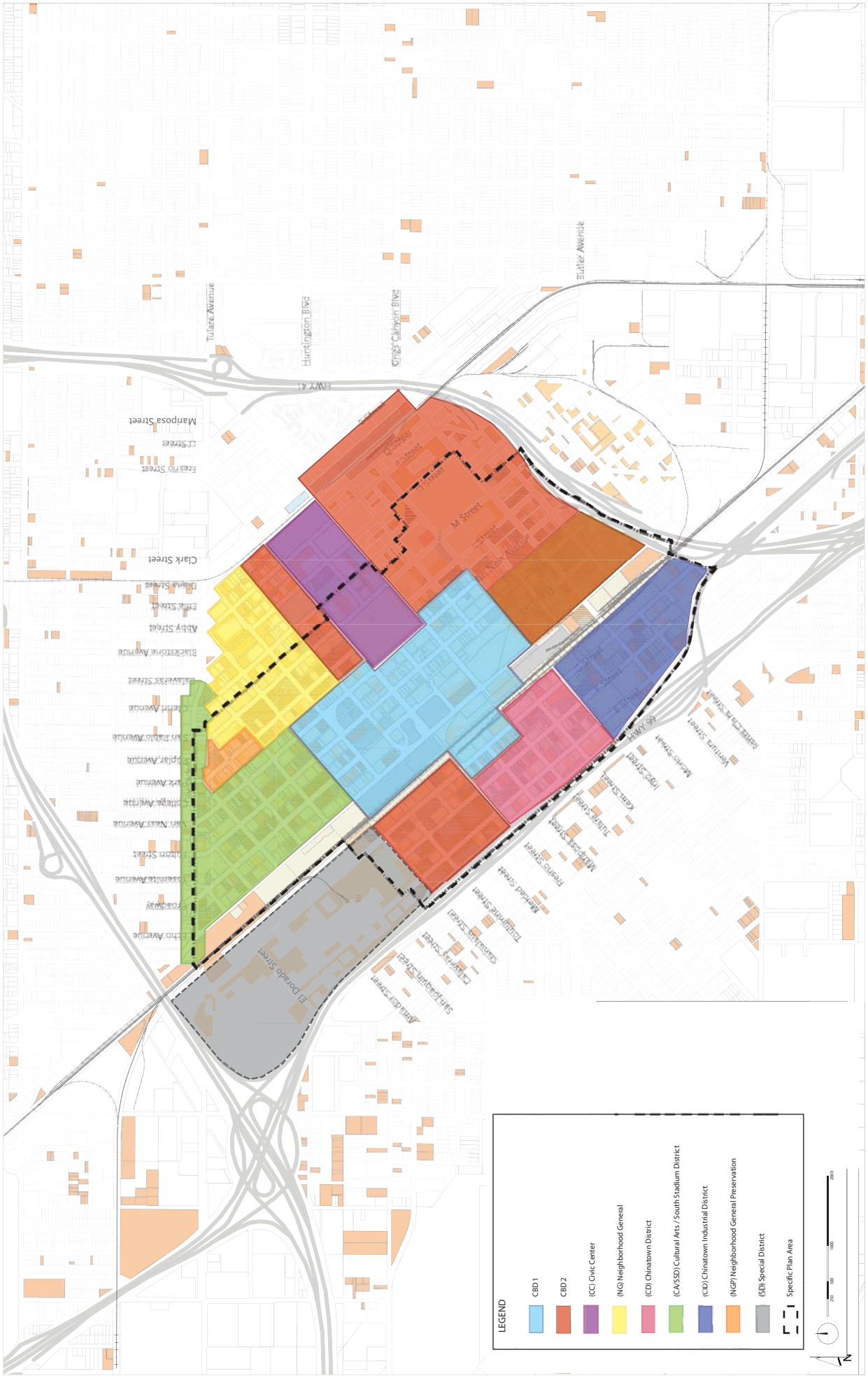


Figure 1.3 Specific Plan Zones

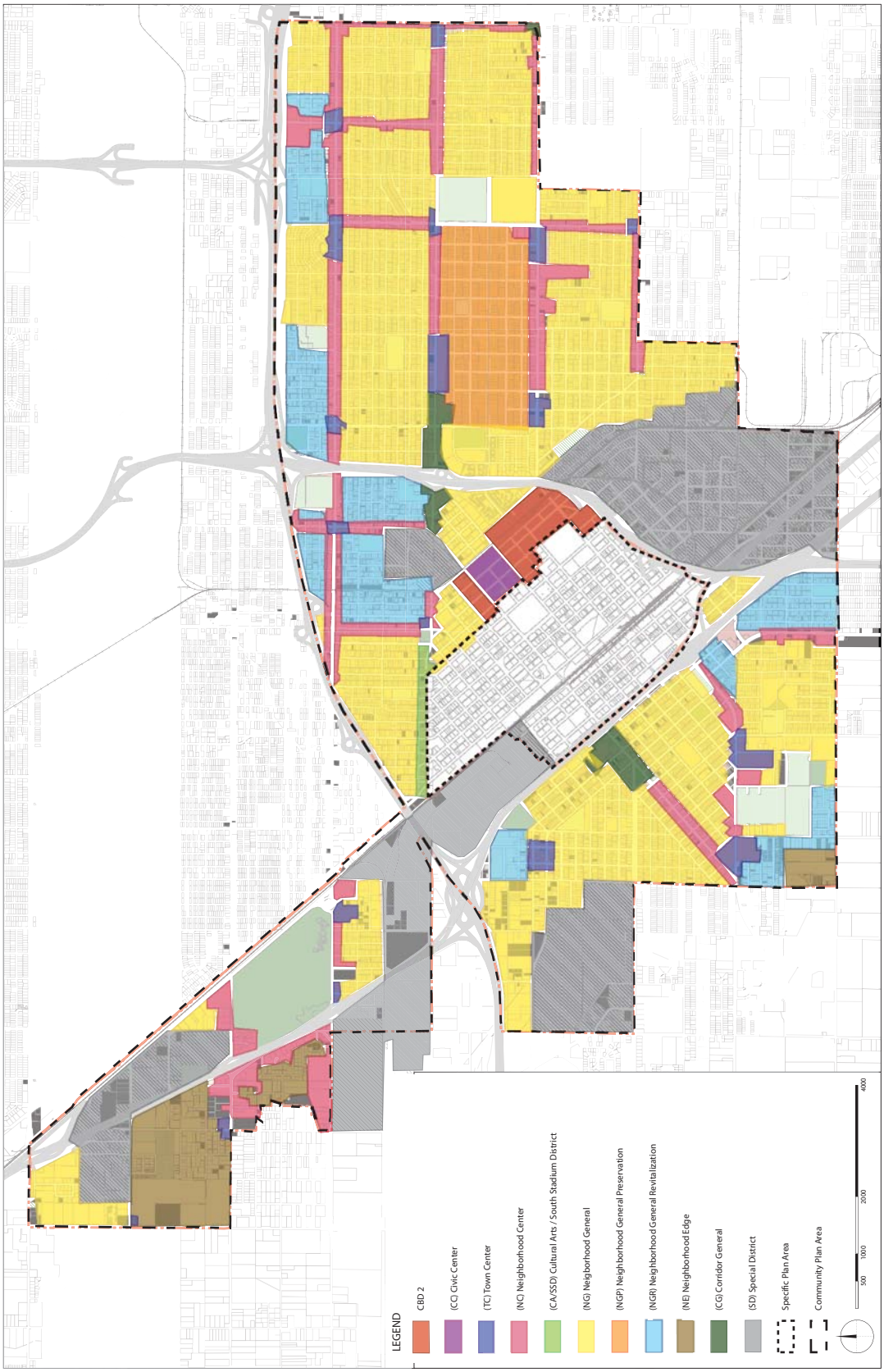


Figure 1.4 Zone Specific Plan Zones

Table 1.3 General Plan Allowed Population Increase Within Area of Combined Specific Plan and Community Plan (by Existing Plan Areas)

Existing Community Plan	% within combined FCSP/DNSP boundary	Allowed Population Increase (Persons)		Population within FCSP/DNCP Boundary (Persons)	
		Within Each Existing Community Plan	Within Combined FCSP/DNCP Boundary	Year 2000	Year 2035
Central Area	1	12,845	12,845	14,927	27,772
Edison	0	43,286	7,657	12,356	20,013
Roosevelt	0	39,036	5,809	35,598	41,407
West Area	0	73,913	5,447	4,754	10,201
Total		**169,080**	**31,758**	**67,635**	**99,393**

**Source: Moule & Polyzoides Architects & Urbanists, April, 2011*

Appendix 2: Wet Utilities

Table 2.1. Current and Planned Water Supplies (from UWMP)

	Current and Planned Water Supplies, af/yr*					
Water Supply Sources	**2005 (actual)**	**2010**	**2015**	**2020**	**2025**	**2030**
Treated Surface Water	15,807	30,800	92,500	123,400	123,400	123,400
Groundwater	141,471	131,750	95,800	82,000	85,000	100,600
Recycled Water		750	1,000	1,000	25,000	25,000
Total	157,278	163,300	189,300	206,400	233,400	249,000

**Source:UWMP Table4-18*

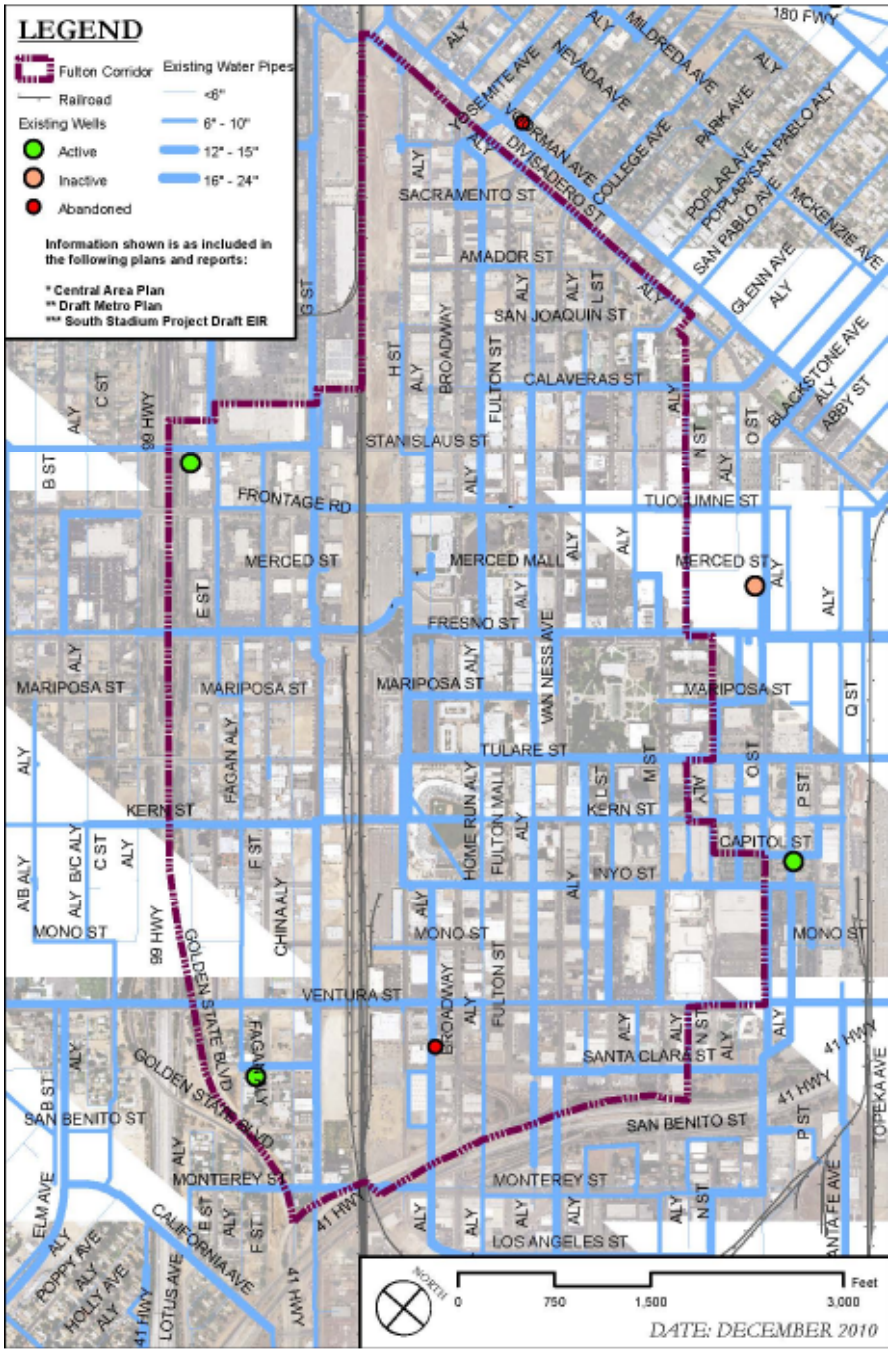


Fig 2.1 Existing Water Distribution System—Specific Plan Area

Table 2.2 City-Wide Demand Projections by Customer Class
2008 UWMP

Land-Use Based Demand Projections by Customer Class*

	Unit Factors, af/ac/yr			Low Demand Estimate						High Demand Estimate					
				2005 (estimated)		2010		2025		2005 (estimated)		2010		2025	
Customer Class	2005	2010	2025	Area, acres	Water Demand af/yr	Area, acres	Water Demand af/yr	Area, acres	Water Demand af/yr	Area, acres	Water Demand af/yr	Area, acres	Water Demand af/yr	Area, acres	Water Demand af/yr
Single Family Residentia	3.8	3.5	3.2	21,948	89,700	25,619	89,700	36,244	116,000	22,777	86,600	26,688	93,400	37,414	119,700
Multi Family Residential	6.5	6.2	6.2	3,757	23,300	3,757	23,300	4,639	28,800	3,852	25,000	4,133	25,600	4,981	30,900
Commercial/Institutional	2.0	1.9	1.9	12,771	24,300	12,771	24,300	19,393	36,700	14,084	28,200	14,563	27,700	21,273	40,400
Industrial	2.0	1.9	1.9	1,994	3,800	1,994	3,800	4,098	7,800	1,994	4,000	1,994	3,800	4,098	7,800
Landscape Irrigation	3.0	2.9	2.9	2,876	6,900	2,376	6,900	2,675	7,800	2,310	6,900	2,391	6,900	2,705	7,800
Sourth East Growth Area	3.4	3.2	3.2	2,094	6,700	2,094	6,700	3,376	26,800	0	0	2,094	6,700	8,376	26,800
Total Projected Consuption					14,800		154,700		223,900		150,700		164,100		233,400
UAFW (10%)					15,800		17,200		24,900		16,700		18,200		25,900
Total Projected Production					157,600		171,900		248,800		167,400		182,300		259,300

** Source: UWMP Table 6-4*

Table 2.3 Specific Plan Existing Water Demand

Existing Demand- SPECIFIC Plan

	Parcel Area (sf)		Parcel Area (ac)						Total Demand (gpd)				
Land Use Category	**Developed**	**Underutilized**	**Developed**		**Underutilized**		**TOTAL**	**2010 Unit Demand per acre**	**Developed**		**Underutilized**		**Combined**
Single Family Residence	134,165	13,068	3.1	+	0.30	=	3.4	3,124	9,623	+	937	=	10,560
Multi-family Residence	371,131	72,745	8.5	+	1.67	=	10.2	5,535	47,155	+	9,243	=	56,398
Commercial	6,932,574	2,450,686	159.2	+	56.26	=	215.4	1,696	269,934	+	95,422	=	365,356
Industrial	4,781,581	1,624,788	109.8	+	37.30	=	147.1	1,696	186,180	+	63,264	=	249,445
Landscape Irrigation	3,920	33,106	0.1	+	0.76	=	0.9	2,589	233	+	1,967	=	2,200
Parking & Vacant	2,700,720	0	62.0	+	0.00	=	62.0	0	0	+	0	=	0
TOTALS	**14,924,092**	**4,194,392**	**342.6**	**+**	**96.29**	**=**	**438.9**		**513,125**	**+**	**170,834**	**=**	**683,959**

Source: 2010 unit demands from 2008 UWMP, converted as follows: acre feet/year/acre x 892.7 = gallons/day/acre

Table 2.4 Community Plan Existing Demand

	Parcel Area (sf)		Parcel Area (ac)			Total Demand (gpd)		
Land Use Category	**Developed**	**Underutilized**	**Developed**	**Underutilized**	**2010 Unit Demand per acre**	**Developed**	**Underutilized**	**Combined**
Single Family Residence	79,675,556	566,308	1,829	13	3,124	5,714,811	40,619	5,755,430
Multi-family Residence	13,519,489	69,136	310	2	5,535	1,717,753	8,784	1,726,537
Commercial	36,818,937	320,428	845	7	1,696	1,433,618	12,477	1,446,095
Industrial	35,494,916	2,956,993	815	68	1,696	1,382,065	115,136	1,497,201
Landscape Irrigation	12,716,274	15,931	292	0	2,589	755,730	947	756,677
Parking	1,664,699	0	38	0	0	0	0	0
Vacant	3,876,730	8,800,166	89	202	0	0	0	0
TOTALS	**183,766,601**	**12,728,963**	**4,219**	**292**		**11,003,978**	**177,963**	**11,181,940**

Source: 2010 unit demands from 2008 UWMP, converted as follows: acre feet/year/acre x 892.7 = gallons/day/acre

Table 2.5 Specific Plan Projected Water Demand, Max and Min FAR cases

PROJECTED WATER DEMAND: MAXIMUM FAR

Zone	Total Buildable	Residential 240 gpd/unit		Office 240 gpd/1000 sf		Retail 240 gpd/1000 sf		Industrial 240 gpd/1000 sf		Total District Demand	Zone average unit demand
	SF	Units	Demand	SF	Demand	SF	Demand	SF	Demand	gpd	gpd/1000sf
CBD 1	6,542,377	2,453	588,814	2,616,951	628,068	981,357	117,763	0	0	1,334,645	204
CBD 2	3,354,417	1,817	436,074	838,604	201,265	335,442	40,253	0	0	677,592	202
Civic Center	0	0	0	0	0	0	0	0	0	0	210
Chinatown District	808,590	438	105,117	161,718	38,812	121,288	14,555	0	0	158,484	196
Cultural Arts/ South Stadium District	2,615,326	1,308	313,839	523,065	125,536	523,065	62,768	0	0	502,143	192
Chinatown Industrial District	410,284	0	0	102,571	24,617	0	0	307,713	36,926	61,543	150
Town Center	0	0	0	0	0	0	0	0	0	0	210
Neighborhood General	280,795	234	56,159	0	0	0	0	0	0	56,159	200
Neighborhood General Preservation	45,975	38	9,195	0	0	0	0	0	0	9,195	200
Special District	65,879	3	659	3,294	791	0	0	59,291	7,115	8,564	130
0	0	0	0	0	0	0	0	0	0	0	191
NEW DEVELOPMENT TOTALS	14,123,642	6,291	1,509,857	4,246,203	1,019,089	1,961,152	235,338	367,004	44,040	2,808,324	

PROJECTED WATER DEMAND: MINIMUM FAR

Zone	Total Buildable	Residential 240 gpd/unit		Office 240 gpd/1000 sf		Retail 240 gpd/1000 sf		Industrial 240 gpd/1000 sf		Total District Demand	Zone average unit demand
	SF	Units	Demand	SF	Demand	SF	Demand	SF	Demand	gpd	gpd/1000sf
CBD 1	1,840,519	690	165,647	736,208	176,690	276,078	33,129	0	0	375,466	204
CBD 2	1,613,948	874	209,813	403,487	96,837	161,395	19,367	0	0	326,018	202
Civic Center	0	0	0	0	0	0	0	0	0	0	210
Chinatown District	506,456	274	65,839	101,291	24,310	75,968	9,116	0	0	99,265	196
Cultural Arts/ South Stadium District	1,008,694	504	121,043	201,739	48,417	201,739	24,209	0	0	193,669	192
Chinatown Industrial District	101,605	0	0	25,401	6,096	0	0	76,204	9,144	15,241	150
Town Center	0	0	0	0	0	0	0	0	0	0	210
Neighborhood General	117,994	98	23,599	0	0	0	0	0	0	23,599	200
Neighborhood General Preservation	24,872	21	4,974	0	0	0	0	0	0	4,974	200
Special District	26,339	1	263	1,317	316	0	0	23,705	2,845	3,424	130
0	0	0	0	0	0	0	0	0	0	0	191
NEW DEVELOPMENT TOTALS	5,240,428	2,463	591,179	1,469,443	352,666	715,180	85,822	99,909	11,989	1,041,656	

Table 2.6 Community Plan Projected Water Demand, Max and Min FAR Case

PROJECTED WATER DEMAND: MAXIMUM FAR

Zone	Total Buildable	Residential 240 gpd/unit		Office 240 gpd/1000 sf		Retail 240 gpd/1000 sf		Industrial 240 gpd/1000 sf		Total District Demand	Zone average unit demand
	SF	Units	Demand	SF	Demand	SF	Demand	SF	Demand	gpd	gpd/1000sf
CBD 2	143,804	74	17,760	50,836	12,201	4,107	493	0	0	30,453	212
Cultural Arts/ South Stadium District	120,362	63	15,120	37,392	8,974	7,553	906	0	0	25,000	208
Town Center	321,398	130	31,200	133,451	32,028	32,347	3,882	0	0	67,110	209
Neighborhood Center	923,900	361	86,640	408,649	98,076	82,544	9,905	0	0	194,621	211
Corridor General	1,712,881	141	33,840	1,367,547	328,211	175,785	21,094	0	0	383,145	224
Neighborhood General	2,042,255	1,702	408,480	0	0	0	0	0	0	408,480	200
Neighborhood General Revitalization	745,344	621	149,040	0	0	0	0	0	0	149,040	200
Neighborhood Edge	568,511	474	113,760	0	0	0	0	0	0	113,760	200
Special District	3,133,494	131	31,440	0	0	48,864	5,864	2,927,200	351,264	388,568	124
TOTALS	**14,123,642**	**6,291**	**887,280**	**4,246,203**	**479,490**	**1,961,152**	**42,144**	**367,004**	**351,264**	**1,760,178**	

PROJECTED WATER DEMAND MIN CASE

Zone	Total Buildable	Residential 240 gpd/unit		Office 240 gpd/1000 sf		Retail 240 gpd/1000 sf		Industrial 240 gpd/1000 sf		Total District Demand	Zone average unit demand
	SF	Units	Demand	SF	Demand	SF	Demand	SF	Demand	gpd	gpd/1000sf
CBD 2	52,830	27	6,529	18,676	4,482	1,509	181	0	0	11,192	212
Cultural Arts/ South Stadium District	29,182	15	3,657	9,066	2,176	1,831	220	0	0	6,053	207
Town Center	92,157	37	8,923	38,266	9,184	9,275	1,113	0	0	19,220	209
Neighborhood Center	213,208	83	19,971	94,304	22,633	19,049	2,286	0	0	44,890	211
Corridor General	438,412	36	8,679	350,024	84,006	44,992	5,399	0	0	98,084	224
Neighborhood General	512,450	427	102,490	0	0	0	0	0	0	102,490	200
Neighborhood General Revitalization	187,024	156	37,405	0	0	0	0	0	0	37,405	200
Neighborhood Edge	105,350	88	21,070	0	0	0	0	0	0	21,070	200
Special District	876,729	37	8,810	0	0	13,672	1,641	819,009	98,281	108,731	124
TOTALS	**2,507,342**	**909**	**217,534**	**510,335**	**122,480**	**90,328**	**10,839**	**819,009**	**98,281**	**449,135**	

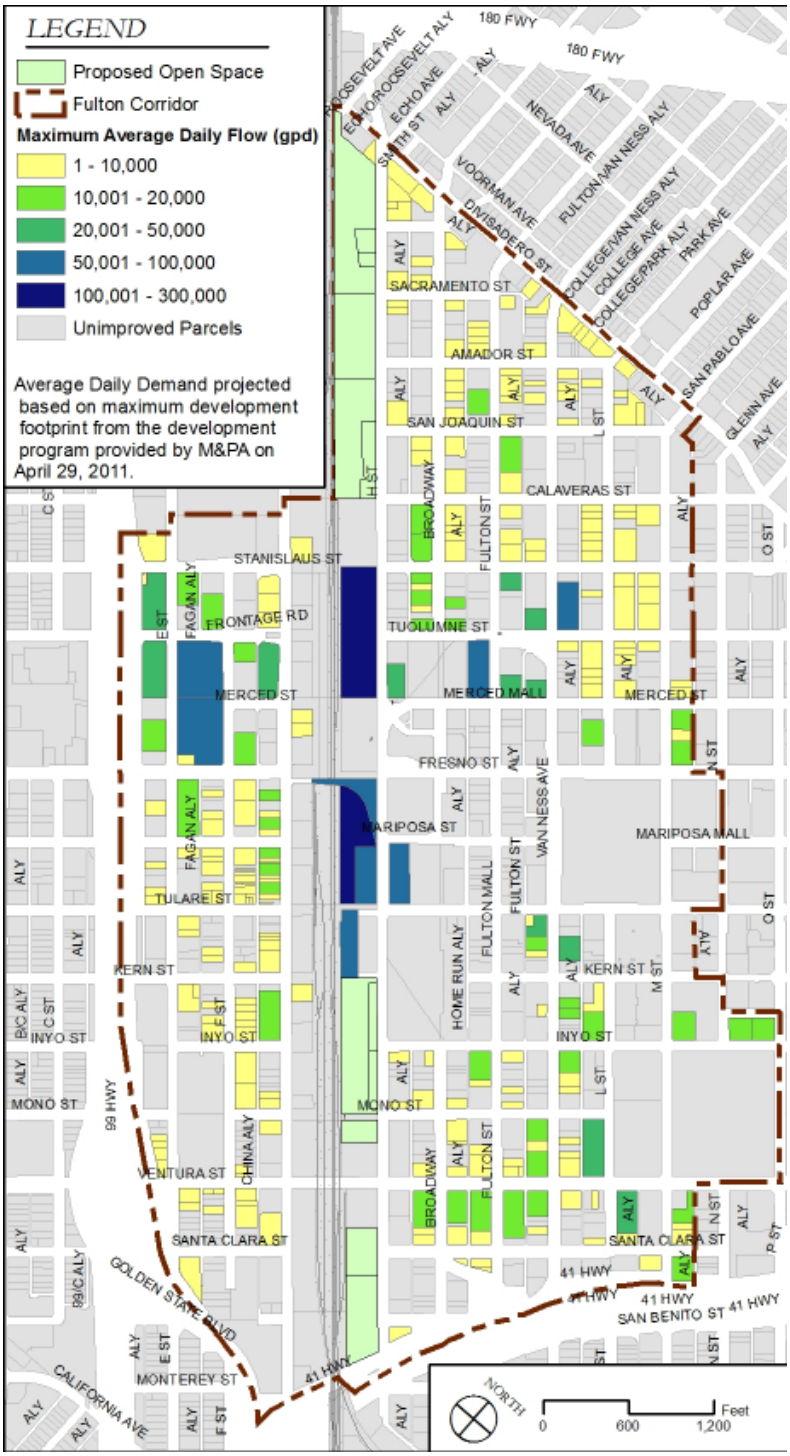


Fig 2.2 Projected Water Demand by Parcel—Specific Plan Area
(Maximum Build-Out)

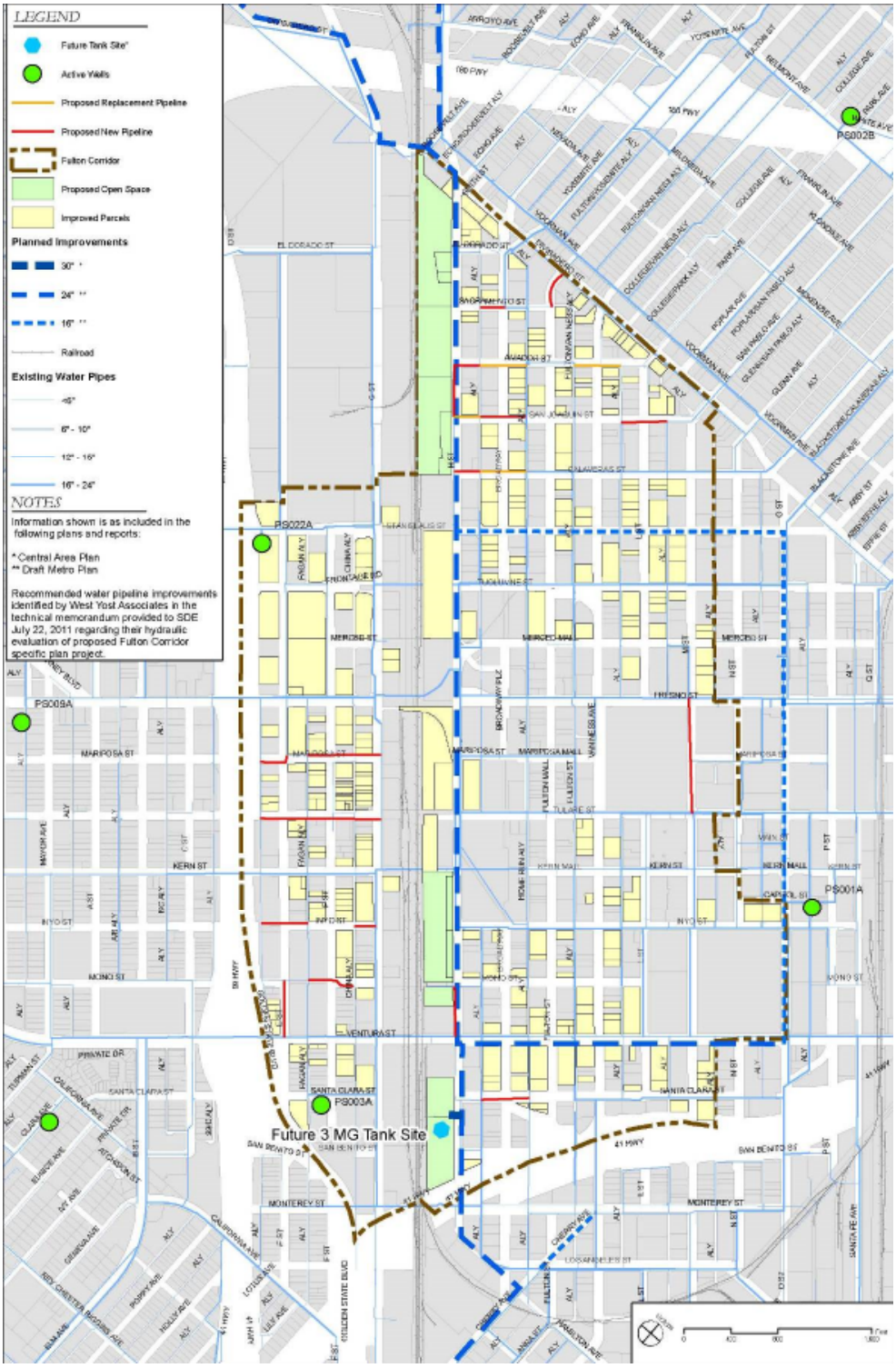


Fig 2.3 Water Infrastructure and Required Water Infrastructure Improvements—Specific Plan Area
(Maximum Build-Out)

Table 2.7 Specific Plan Existing Sewer Generation

Existing Sewer Flow								
	Without Existing Use	With Existing Use		Total Acres	ADWF	PDWF	I&I	PWWF
Parcel Condition	ac	ac	GPD	ac	GPD	GPD	GPD	GPD
Already Developed	23.5	280.6	745.2	304.1	745,131	1,110,245	2,806,000	3,916,245
Vacant & Underutilized	38.6	96.2	225.1	134.7	225,138	335,456	961,600	1,297,056
TOTAL	62.0	376.8	970.3	438.8	970,269	1,445,701	3,767,600	5,213,301

Table 2.8 Projected Wastewater Generation Specific Plan Area

Proposed Sewer Flow								
	Without Existing Use	With Existing Use		Total Acres	ADWF	PDWF	I&I	PWWF
Parcel Condition	ac	ac	GPD	ac	GPD	GPD	GPD	GPD
Already Developed	23.5	280.6	745,181.0	304.1	745,181	1,110,320	2,806,000	3,916,320
Vacant & Underutilized	16.2	118.5	2,213,627.0	134.7	2,213,627	3,298,304	177,750	3,476,054
TOTAL	39.7	399.1	2,958,808.0	438.8	2,958,808	4,408,624	2,983,750	7,392,374

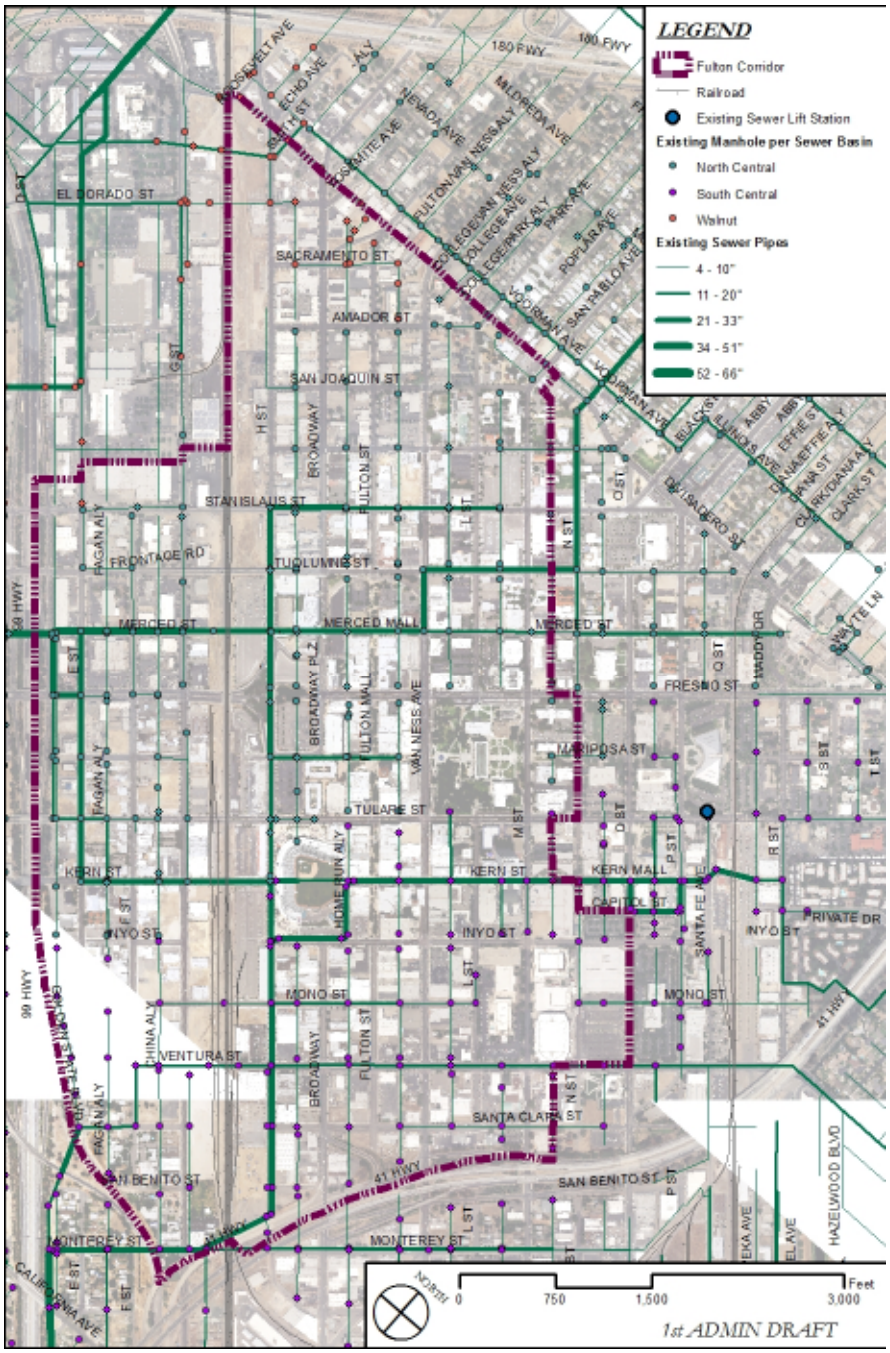


Fig 2.4 Existing Sewer System—Specific Plan Area

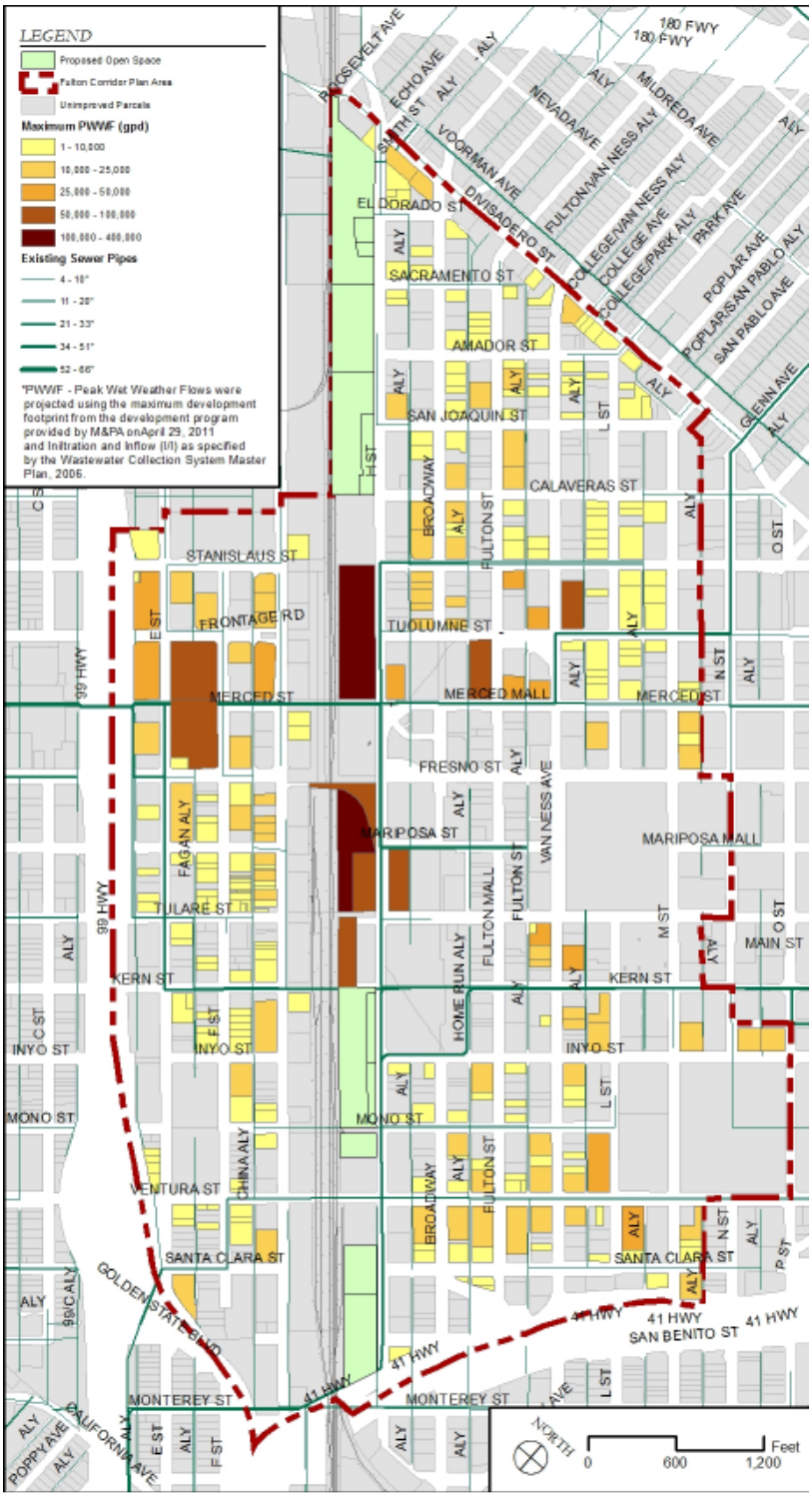


Fig 2.5 Existing Sewer Infrastructure and Projected Generation—Specific Plan Area

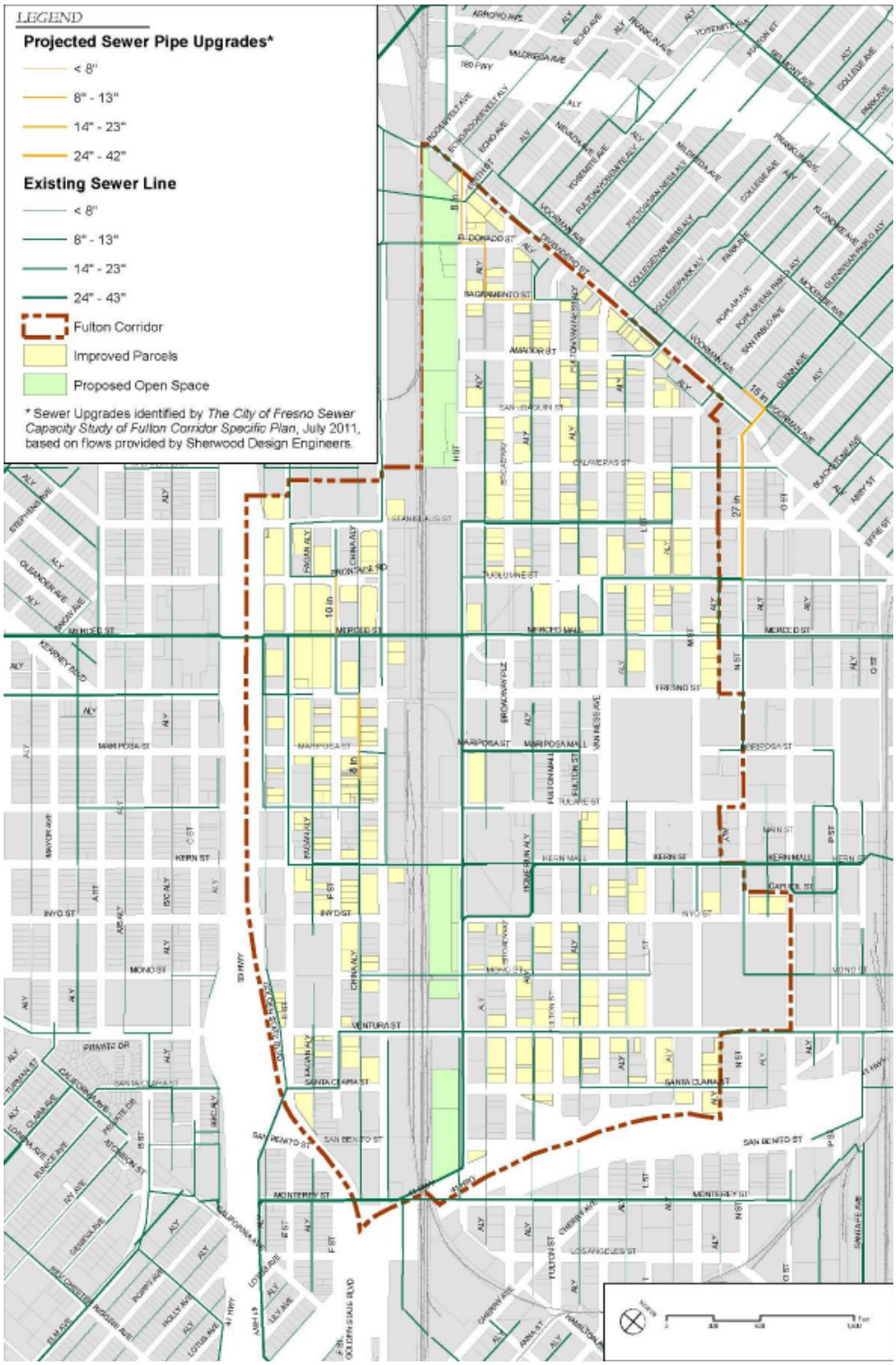


Fig 2.6 Sewer Infrastructure and Required Improvements—Specific Plan Area

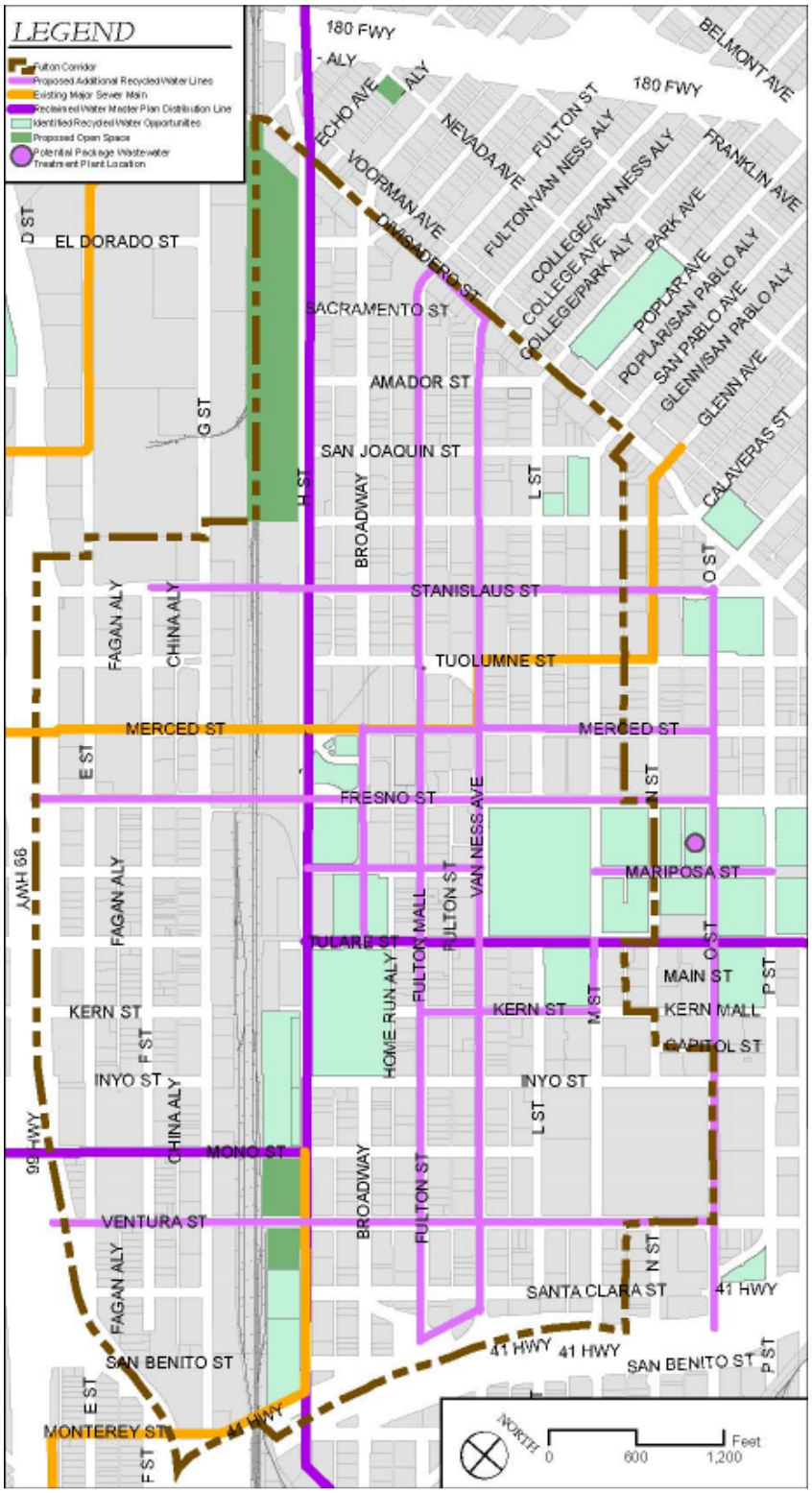


Fig 2.7 Proposed Recycled Water Infrastructure and Opportunities Specific Plan Area

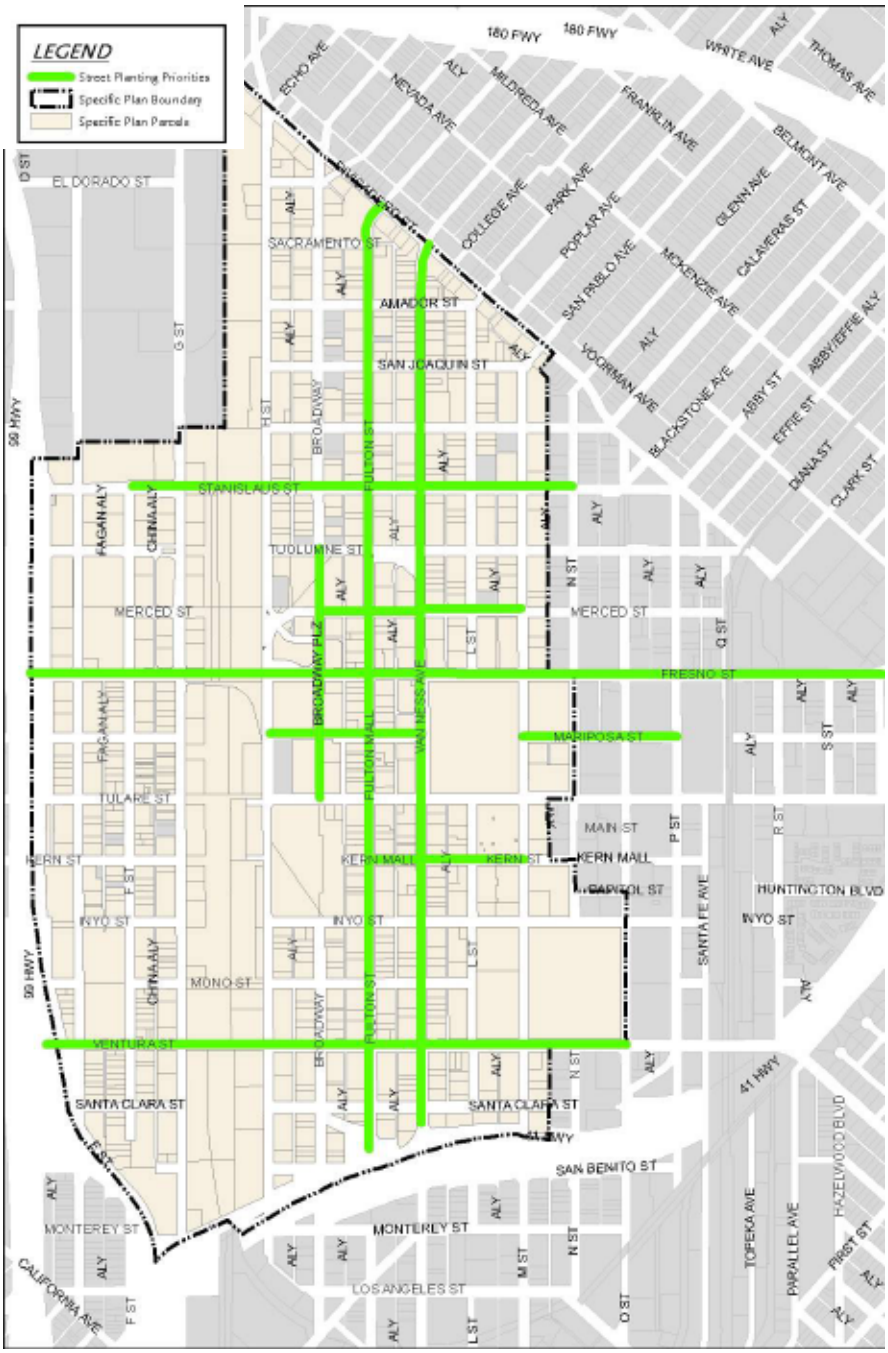


Fig 2.8 Landscape for Streets Plan—Specific Plan Area

Appendix 3: Stormwater

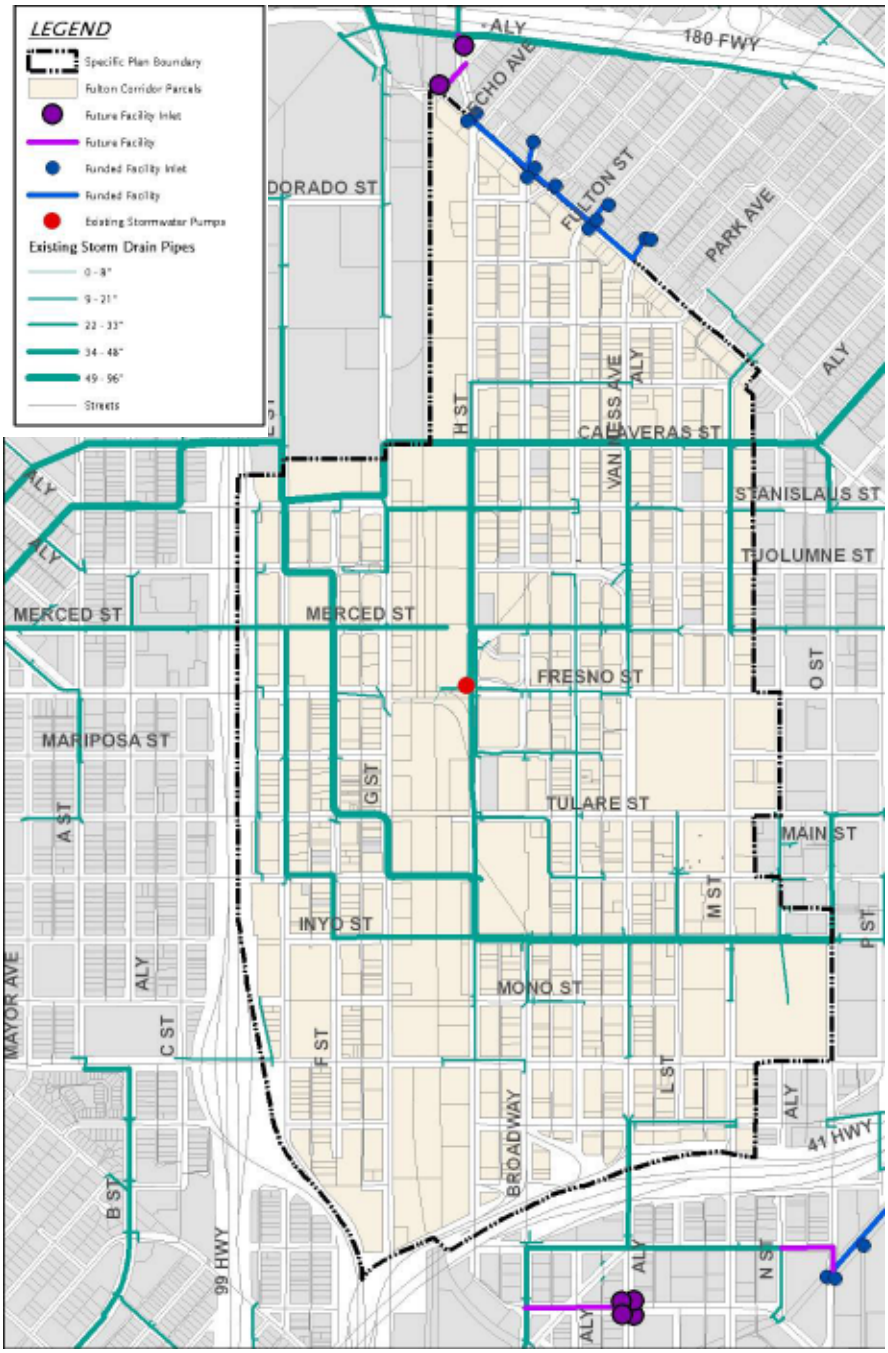


Fig 3.1 Existing Downtown Storm Drain System—Specific Plan Area

Table 3.1 Existing Weighted Coefficient of Runoff for the Specific Plan Area

EXISTING CONDITION								
	Percent of	Weighted	Residential		Commercial		Industrial	
	Total SP	C	%	C	%	C	%	C
FCSP Area	100%	0.78	0%	0.75	55%	0.80	45%	0.75
TOTALS	100%	0.78						

Table 3.2 Proposed Weighted Coefficient of Runoff for the Specific Plan Area

DEVELOPMENT POTENTIAL MAX CASE										
Zone	Percent of	Weighted	Residential		Office		Retail		Industrial	
	Total SP	C	%	C	%	C	%	C	%	C
CBD 1	20%	0.78	45%	0.75	40%	0.80	15%	0.80	0%	0.75
CBD 2	20%	0.77	65%	0.75	25%	0.80	10%	0.80	0%	0.75
Civic Center	4%	0.80	0%	0.75	75%	0.80	25%	0.80	0%	0.75
Chinatown District	7%	0.77	65%	0.75	20%	0.80	15%	0.80	0%	0.75
Cultural Arts/ South Stadium District	15%	0.77	60%	0.75	20%	0.80	20%	0.80	0%	0.75
Chinatown Industrial District	10%	0.76	0%	0.75	25%	0.80	0%	0.80	75%	0.75
Town Center	0%	0.80	0%	0.75	75%	0.80	25%	0.80	0%	0.75
Neighborhood General	5%	0.75	100%	0.75	0%	0.80	0%	0.80	0%	0.75
Neighborhood General Preservation	8%	0.75	100%	0.75	0%	0.80	0%	0.80	0%	0.75
Special District	2%	0.75	5%	0.75	5%	0.80	0%	0.80	90%	0.75
Other (proposed park / open space)	9%	0.40	0%	0.75	0%	0.80	0%	0.80	0%	0.75
TOTALS	100%	0.74								

Fig 3.2 Aerial Photo of Planned Corridor—Existing Conditions

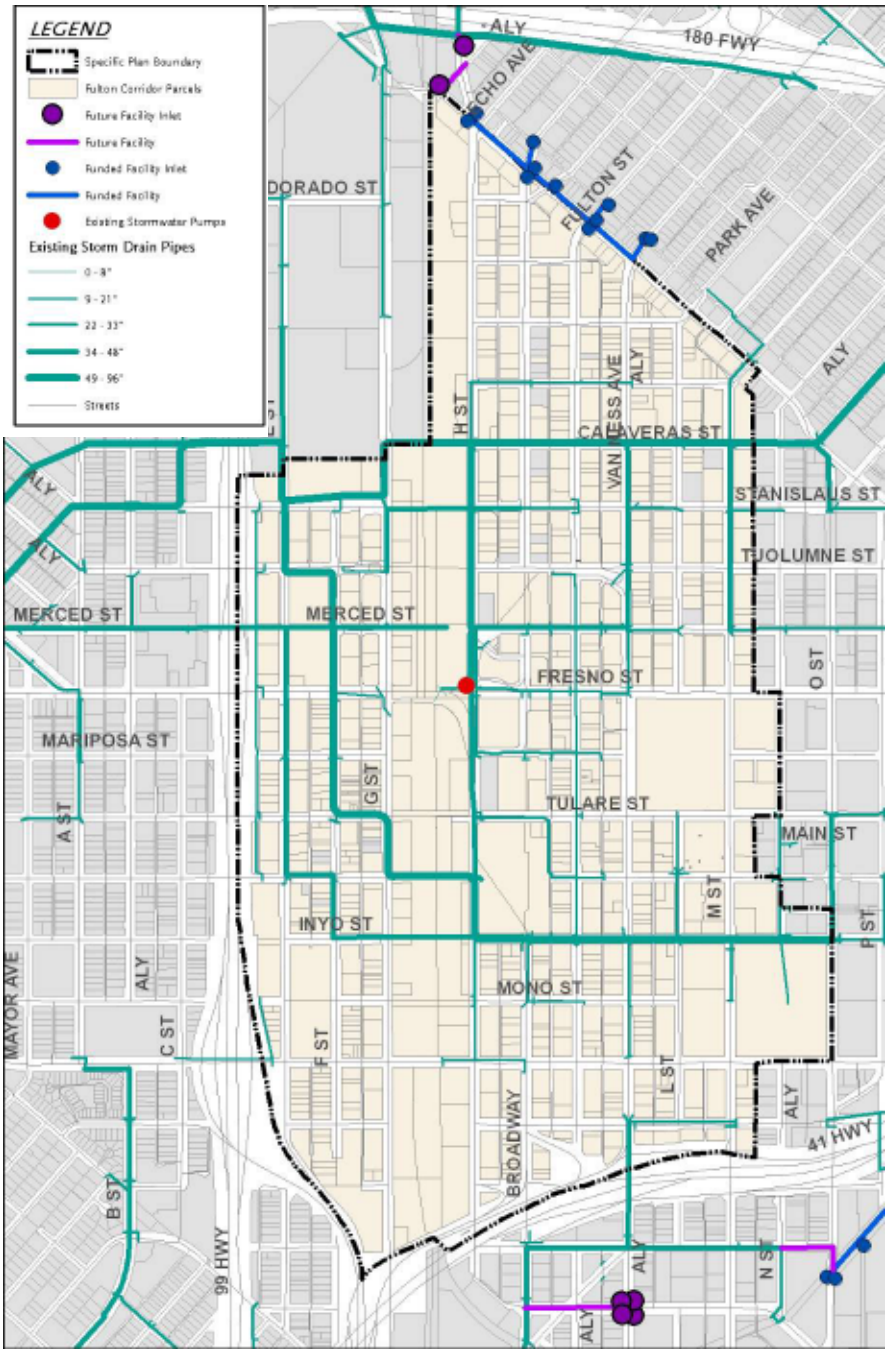


Fig 3.1 Existing Downtown Storm Drain System—Specific Plan Area

Table 3.3 Menu of Sustainable Stormwater Strategies

Stormwater Planters (Infiltration and Flow-Through)

Within an urban context, planters are typically small, vegetated areas situated within an area of otherwise impervious hardscape, such as inside curb islands or cut into a sidewalk against a building wall. Given these locational characteristics, stormwater management planters often receive runoff from a discrete, dedicated source, such as a rainwater leader or a tightly defined section of sidewalk or roadway pavement. The two types of planters used for this purpose are infiltration and flow-through. Infiltration planters depend on native soil conditions that allow runoff to soak into the underlying soil. Flow-through planters are completely contained systems that only allow runoff to soak through the planter's imported soil bed and then into underdrains that are connected to the storm drain system. Both types reduce the rate of stormwater runoff, which eases the burden on local storm drain facilities, but infiltration planters are more desirable because they also reduce the total volume of runoff. Flow-through planters are appropriate where native soil conditions are unfavorable to infiltration, at locations above underground structures, where there is underlying soil contamination, and/or where the seasonal high water table is within 10 feet of the landscape surface. Stormwater planters are easily incorporated into retrofit conditions and in places where space is limited.

Pervious Paving Systems

Pervious paving systems allow rain water to pass through their surface and soak into the underlying ground. Pervious paving must be designed to not only manage stormwater runoff adequately, but also meet the load bearing requirements of the proposed application and provide a level of durability equivalent to conventional paving. Urban plazas, parking stalls or other low traffic areas are typically ideal for the application of pervious paving, as opposed to heavily loaded or high traffic volume areas. Runoff from streets and parking areas should be treated for water quality before infiltrating through permeable pavers and into the ground.

Swales

Vegetated swales are long, narrow landscaped depressions, with a slight longitudinal slope. They are primarily used to convey stormwater runoff on the land's surface while also providing water quality treatment. As water flows through a vegetated swale, it is slowed by the interaction with plants and soil, allowing sediments and associated pollutants to settle out or be adsorbed by the plant material. In addition, there is generally some reduction in the volume of runoff, because water that soaks into the soil is taken up by plants or percolates into deeper strata if native soils are well drained. The remaining water that continues to flow downstream travels more slowly than it would through pipes in a traditional stormwater conveyance system, which further reduces peak flow rates. To maximize vegetative contact, vegetated swales are typically built very shallow and contain runoff that is only a few inches deep. Vegetated swales are relatively low-cost, simple to construct, easy to maintain, and widely accepted as a stormwater management strategy. They can be planted in a variety of ways, ranging from mown grass to a diverse palette of grasses, sedges, rushes, shrubs, groundcover, and trees.

Rain Gardens

Rain gardens are large, shallow, vegetated depressions in the landscape. They can be any size or shape, and are often molded to fit in "leftover" spaces in parking lots, along street frontages, and in situations where streets intersect at odd angles.

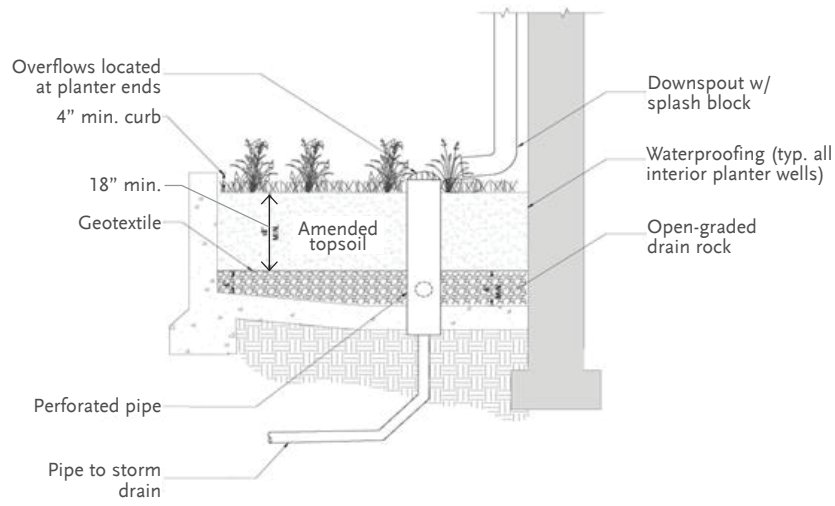
Rain gardens retain stormwater, thereby attenuating peak flows and overall volume. They can also allow for infiltration, depending on the capacity of the native soil. Although rain gardens can share certain characteristics with swales and planters (they can be designed with vertical curbs or side slopes), they differ from swales in that their primary function is the maximum storage of runoff, not conveyance. Accordingly, they are typically designed to be flat-bottomed without any longitudinal slope in order to maximize stormwater storage potential.

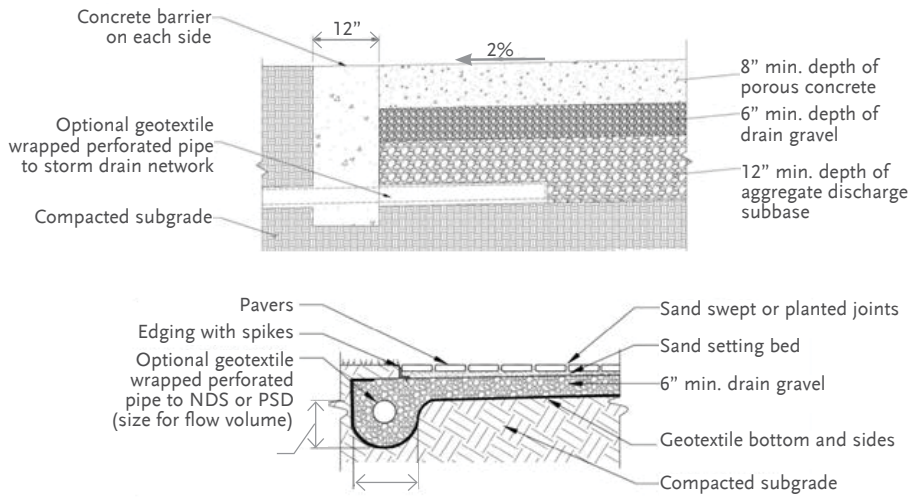
Curb Extensions

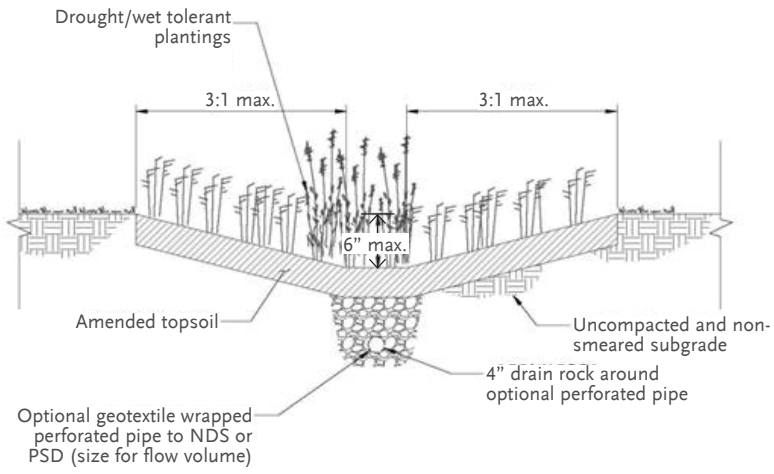
Stormwater curb extensions are landscape areas that extend into the street and capture stormwater runoff. Conventional curb extensions (i.e., bulb outs, chokers, chicanes) are commonly used to increase pedestrian safety and help calm traffic. Stormwater curb extensions share these same attributes and add a stormwater benefit by allowing water to flow into landscape space. This landscape space can be designed with the physical characteristics of vegetated swales, planters, or rain gardens depending on the available space and specific site conditions.

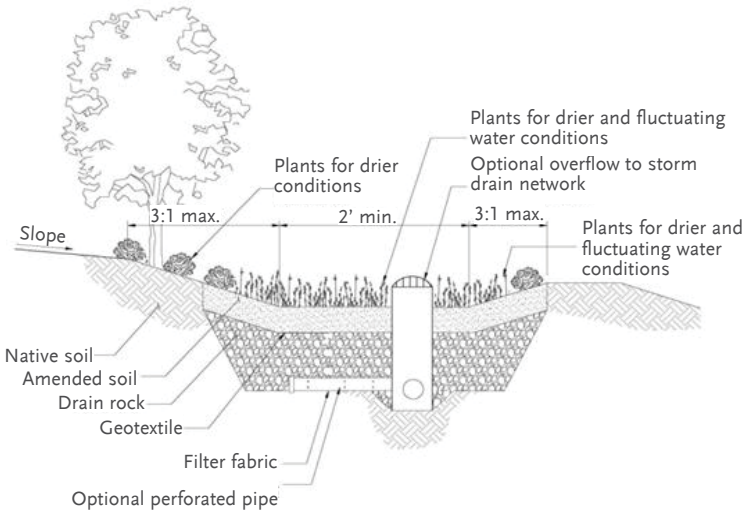
Stormwater curb extensions are particularly advantageous in retrofit situations because they can often be added to existing streets with minimal disturbance. The small footprint of these features allows for an efficient stormwater management system that often performs very well for a relatively low implementation cost. Stormwater curb extensions can be planted with a variety of trees, shrubs, grasses and ground covers, depending on site context and conditions.

Table 3.3 Menu of Sustainable Stormwater Strategies (continued)









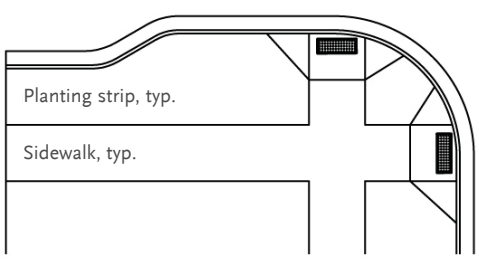


Table 3.4 Parking Lot Retrofit

PARKING LOT RETROFITS	Potential LID Measures				
	Flow-Through and Infiltration Planters	Swales	Rain Gardens	Curb Extensions	Tree Planting
Criteria / Properties					
Land use designated by planning program is to remain parking.	✓	✓	✓	✓	✓
Drive aisles are greater than 24' wide.	✓	✓	✓	✓	✓
Presence of underutilized medians and/or 'dead' striping zones.	✓	✓	✓	✓	✓
Long, linear, continuous configuration.	✓		✓		
Large footprint (i.e. for shopping malls, big box stores).	✓		✓	✓	✓
Example Locations					
Stadium Lot - H Street (between Mono Street & Kern Street)	✓	✓	✓	✓	✓
Lot - Homerun Alley @ Inyo Street	✓	✓	✓	✓	✓
2 Lots- H Street (between Fresno Street & Stanislaus Street)	✓	✓	✓	✓	✓
Fresno Met Lot - Calaveras Street @ Van Ness Avenue	✓		✓	✓	✓

Parking lots represent a substantial fraction of impervious surface within the Plan area and offer opportunities for implementing LID techniques. To ensure that adequate parking is made available on-site while also minimizing the impact of impervious paved surfaces, optimal parking lot design can be achieved by narrowing drive aisles. Savings in paved areas can then be replaced by LID water quality treatment applications using strategically placed vegetated swales, rain gardens, or infiltration/flow-through planters that either percolate into underlying soil or are hard piped into the City's existing drainage system. Opportunities for increased tree planting would also improve the shade canopy and reduce heat island effects. Area made available by streamlining parking could also be potentially used to install solar arrays to offset energy demands of nearby buildings and public spaces.

Table 3.5 Street Buffer Treatment

STREET BUFFER TREATMENT	Potential LID Measures				
	Flow-Through and Infiltration Planters	Swales	Rain Gardens	Curb Extensions	Tree Planting
Criteria / Properties					
Non-pedestrian medians and/or islands.	✓		✓		✓
Non-pedestrian traditional curb extensions.	✓		✓	✓	✓
Streets with over-abundant permanent parallel parking stalls.	✓	✓	✓	✓	✓
Streets with angled parking stalls.	✓		✓	✓	✓
Leftover landscape and/or asphalt space.	✓	✓	✓	✓	✓
Dead striping zones, such as for "No Parking".	✓		✓	✓	
Example Locations					
Intersection - H Street @Tulare Street	✓		✓	✓	✓
Intersection - F Street @ Mariposa Street	✓		✓		✓
Sidewalk - Calaveras Street @ Van Ness Avenue	✓		✓	✓	✓
Medians & islands - Broadway @ Fresno Street	✓		✓		✓

Similar to parking lots, LID techniques can be integrated into streetscapes and roadways to reduce the extent of paved surfaces and storm-water runoff pollution. Large areas of unused or inefficiently used spaces, such as concrete medians, islands, and unnecessarily wide road-ways or sidewalks, can all be transformed into planted areas that facilitate infiltration, reduce runoff, and alleviate the burden on the City's drainage system. These planted treatment areas can take shape as vegetated swales, infiltration planters, rain gardens, or curb extensions.

Leftover landscape and asphalt spaces are also prime candidates for LID retrofits. For areas where on-street parking is fully utilized, smaller stormwater curb extensions, spaced more frequently, can be used to minimize parking loss to any individual property. Streets striped with "no parking" zones could be converted into stormwater curb extensions without any loss of parking. Existing curb extensions paved with concrete or landscaped can be redesigned as either infiltration or flow-through planters. Stormwater curb extensions can also be constructed on streets with an angled parking configuration.

Table 3.6 Inlet Rain Garden Retrofit

INLET RAIN GARDEN RETROFIT	Potential LID Measures				
	Flow-Through and Infiltration Planters	Swales	Rain Gardens	Curb Extensions	Tree Planting
Criteria / Properties					
Not adjacent to critical utility structures (i.e., hydrant, electrical box).	✓	✓	✓	✓	✓
Near non-pedestrian traditional curb extensions.	✓		✓	✓	
Near existing landscape area or underutilized open space.	✓	✓	✓	✓	✓
Coincide with street buffer intersection locations fitting criteria above.	✓		✓	✓	✓
Example Locations					
3 Inlets - F Street @ Kern Street	✓		✓	✓	
2 Inlets - F Street @ Mariposa Street	✓		✓	✓	
Inlet -Tuolumne Street @ Fulton Street	✓		✓	✓	
Inlet -Stanislaus Street @ Fulton Street	✓		✓	✓	✓

The drainage system within the Plan area is currently designed so that untreated surface runoff flows overland and is collected at curb inlets or in hardscape areas, where it enters the City's storm drain network. Without the capacity to treat at least the first flush of runoff, infiltration basins and receiving water bodies are more likely to accumulate pollutants such as grease, household chemicals, construction debris, and litter. To accomplish this, existing inlets can be relocated or reconfigured to sit inside rain gardens, so that stormwater runoff is first routed through landscaped detention or bio-retention facilities, allowing pollutants to be filtered out by soil and plant material.

Table 3.7 Plaza Retrofit Treatment

PLAZA RETROFIT TREATMENT	Potential LID Measures				
	Flow-Through and Infiltration Planters	Swales	Rain Gardens	Pervious Pavers	Tree Planting
Criteria / Properties					
Within existing pedestrian mall corridors.	✓		✓	✓	✓
Areas with limited or prohibited vehicular traffic.	✓		✓	✓	✓
Not adjacent to critical utility structures (i.e., hydrant, electrical box).	✓		✓	✓	✓
Example Locations					
Merced Pedestrian Plaza	✓		✓	✓	✓
Mariposa Pedestrian Plaza	✓		✓	✓	✓
Kern Pedestrian Plaza	✓		✓	✓	✓
Fulton Pedestrian Plaza	✓		✓	✓	✓

Pedestrian plazas are prime opportunity areas for replacing otherwise impervious surface cover with permeable pavers, which promotes infiltration and reduces stormwater runoff. By reducing the footprint of required stormwater treatment measures, pervious paving is often the only viable option in ultra-urban areas that are served by internal drainage systems. Runoff from streets or parking lots should be treated for water quality before infiltrating through permeable pavers into the ground. It is important to note that pervious pavers along pedestrian walkways must be ADA-compliant and not cause tripping hazards. Pavers are available in a variety of materials and finishes, and may be chosen to complement the streetscape palette or to enhance wayfinding.

Appendix 4: Downtown Community Plan Density Analysis

Administrative Draft – Confidential – For Review by City Staff and City's Retained Consultants Only

180 EAST CALIFORNIA BOULEVARD AT PICHER ALLEY, PASADENA, CALIFORNIA 91105

626 844.2400 PHONE 626 844.2410 FAX
info@mparchitects.com

ELIZABETH MOULE & STEFANOS POLYZOIDES
ARCHITECTS AND URBANISTS

MEMORANDUM

To: Wilma Quan
City of Fresno

From: Juan Gomez-Novy

Date: 5 December 2011

Re: DNCP Density Analysis

CC: Stefanos Polyzoides; Elliott Balch; Elaine Robles; Arnoldo Rodriguez

---

Dear Wilma:

In order to determine the impact of new development as envisioned by the Downtown Neighborhoods Community Plan (DNCP) and implemented through the Downtown Development Code (DDC), on the water, sewer, and storm water systems, Moule & Polyzoides conducted a density analysis comparing how many units could be built on the vacant parcels within the DNCP area per the proposed DDC zoning and per the existing Fresno Municipal Code (FMC) zoning. If you will recall, the development potential for the DNCP, as described in the April 28, 2011 development potential memorandum, was based upon the assumption that vacant parcels would be infilled with new development. Thus this analysis adds another level of detail regarding how new residential units are distributed within the plan area.

The comparison between the DDC and FMC zoning is summarized in **Table 1** (Comparison of New Residential Development Potential: Downtown Development Code vs. Fresno Municipal Code). This comparison was achieved by dividing the DNCP area into smaller subareas, shown in **Figure 1** (DNCP Subareas), and then calculating on a lot by lot basis how many units could be accommodated by the DDC and the FMC, respectively, within each subarea (the lot by lot density assumptions and calculations are shown in **Attachment 1**).

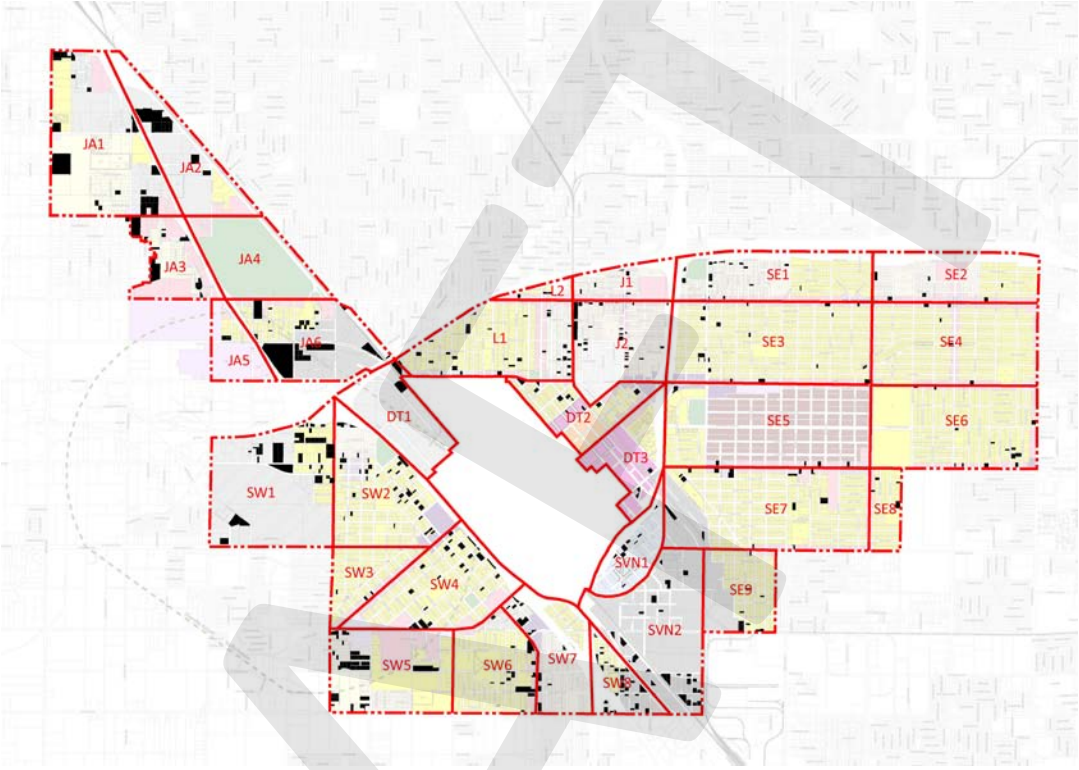
Administrative Draft – Confidential – For Review by City Staff and City's Retained Consultants Only

TABLE 1. Comparison of New Residential Development Potential: Downtown Development Code vs. Fresno Municipal Code[1]

Subarea	Units per Downtown Development Code (DDC)	Units per Fresno Municpal Code (FMC)	Difference (DDC-FMC)
DT1	61	66	-5
DT2	92	170	-78
DT3	18	0	18
J1	22	15	8
J2	155	327	-172
JA1	494	840	-346
JA2	0	53	-53
JA3	307	337	-30
JA4	0	0	0
JA5	16	3	13
JA6	405	53	352
L1	120	290	-169
L2	8	36	-28
SE1	46	73	-27
SE2	53	55	-2
SE3	113	128	-15
SE4	46	58	-12
SE5	68	29	39
SE6	64	93	-29
SE7	129	171	-42
SE8	11	6	5
SE9	30	13	16
SVN1	50	0	50
SVN2	122	47	75
SW1	240	281	-41
SW2	153	255	-102
SW3	14	13	1
SW4	122	260	-138
SW5	265	266	-1
SW6	259	153	106
SW7	140	159	-19
SW8	73	33	39
TOTAL	3,697	**4,283**	**-586**

[1] See **Attachment 1** for lot by lot density assumptions.

FIGURE 1. DNCP Subareas (vacant parcels shown in black).



As you can see, overall the DDC results in almost 600 units less than the FMC. As you can also see, some subareas see an increase in the number of units, while others see a decrease. Increases typically occur in industrial and manufacturing zones which, with the exception of the Downtown Triangle, do not allow residential uses. The DDC introduces live/work uses as allowed uses.

As part of this exercise, Moule & Polyzoides also analyzed how the proposed DDC zoning relates to the existing FMC zoning in terms of building height and density. This analysis showed that in general:

- **AE-5, AE-20, R-1.** The residential density within areas currently zoned for single-family houses (R-1) and as agricultural districts (AE-5 and AE-20) generally increased due to the introduction by the DDC of more dense building types, including Duplexes, Triplexes, Quadplexes, Bungalow Courts, and Rosewalks, and in some cases Courts.

- **R-2, R-2A.** With the exception of the Jane Addams Neighborhoods, the residential density within areas currently zoned for low density multi-family housing (R-2 and R-2A) stayed primarily the same. Areas within the Jane Addams Neighborhoods zoned R-2 and R-2A, generally decreased. The height limit is reduced from 35 feet

- **R-3.** The residential density within areas currently zoned for medium density multi-family housing (R-3), either stayed the same or decreased.

- **R-4.** The residential density within areas currently zoned high density multi-family housing (R-4) – primarily within the Lowell, Jefferson, and Southeast Neighborhoods – decreased.

- **R-P, C-P.** The residential density within areas currently zoned Residential and Professional Office District (R-P) and Administrative and Professional Office District (C-P), principally along corridors, generally stayed the same.

- **C-1, C-2.** The residential density and height within areas currently zoned Neighborhood Shopping District (C-1) and Community Shopping District (C-2) generally stayed the same. Note, however, that this resulted from the assumption that projects built according to the FMC obtained a Conditional Use Permit (CUP) allowing housing within mixed-use buildings. Without the CUP, housing within the C-1 and C-2 Districts is not permitted.

- **C-4, CC.** The residential density within areas currently zoned Central Trading District (C-4) and Civic Center District (CC) decreased. Both of these zones are within the boundaries of the Mid Rise and High Rise Ordinance which permits, with a CUP, high rise buildings without a height limit. The DDC places a 10-story building height cap.

- **C-5, C-6.** The residential density within areas currently zoned General Commercial District (C-5) and Heavy Commercial (C-6) District generally decreased. This zoning occurs primarily along the corridors within the Lowell, Jefferson, and Southeast Neighborhoods. Note, however, that the density decrease resulted from the assumption that projects built according to the FMC obtained a Conditional Use Permit (CUP) that allows housing within mixed-use buildings up to 5 stories in height. Without the CUP, housing within the C-5 and C-6 Districts is not allowed and the building height would remain unchanged at 35' (or 3-stories).

- **C-M**. The residential density within areas currently zoned Commercial and Light Manufacturing District generally increases, while the height generally decreases. Currently, residential uses are not allowed outside the State Route 99, 41, 180 triangle. The DDC changes areas zoned C-M to mixed-use districts, while reducing the height from 75 feet to 3 stories.

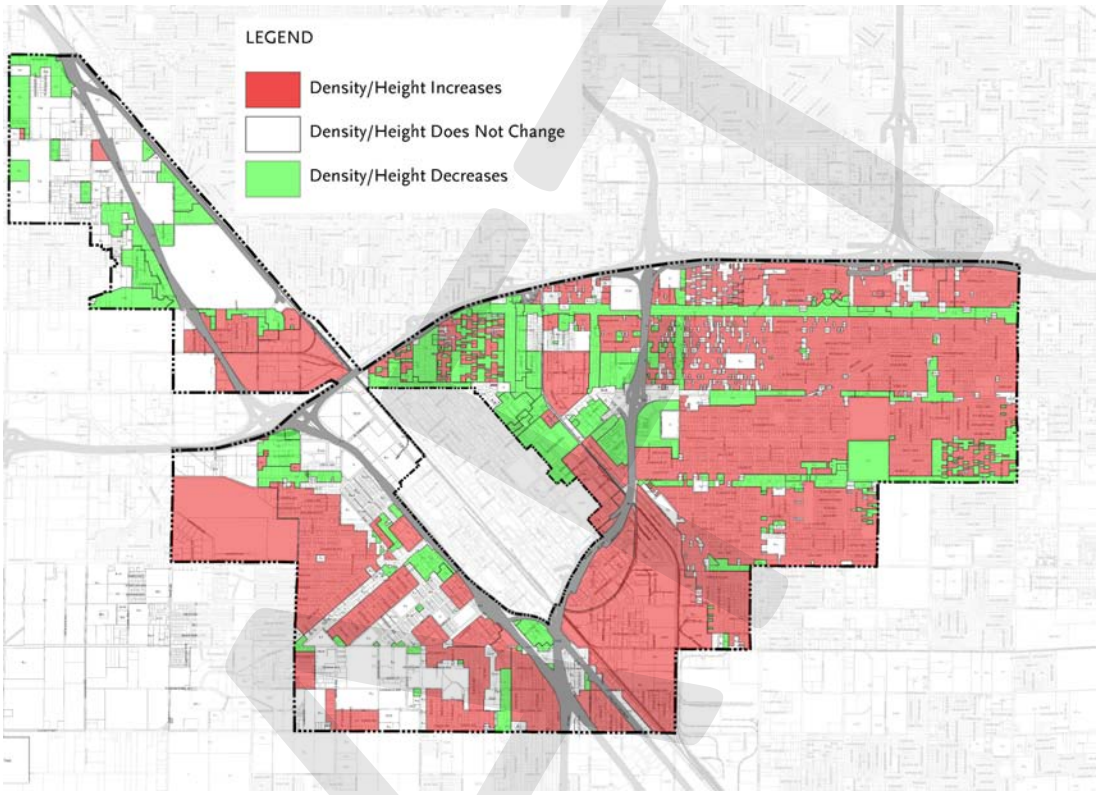
- **M-1, M-2, M-3.** The residential density within areas currently zoned for manufacturing and industrial uses (M-1, M-2, and M-3) increased due to the introduction of live-work building types and uses. Except for within the Central Area Community Plan (CACP) area, the FMC does not permit residential uses within manufacturing and industrial districts. Within the CACP area, residential uses are permitted with a CUP.

- **P.** The residential density within areas currently zoned for off-street parking uses (P) increased due to the introduction of residential building types and uses on these parcels.

- **T-P.** The residential density within areas currently zoned for Trailer Park Residential District (T-P) stayed the same. Note that the DDC does not allow new trailer parks, but does allow existing trailer parks as non-conforming uses.

These increases and decreases in density and/or height are illustrated in **Figure 2** (Density and/or Height Change in Relation to FMC). The detailed zone by zone comparison is shown in **Attachment 2**.

FIGURE 2. Density and/or Height Change in relation to FMC



The density analysis also compared the setback distances between the DDC and FMC. In general (see **Attachment 2** for more detail):

- In the residential neighborhoods, setbacks remain the same or increase.
- Along the corridors, setbacks get smaller (the DDC provides a range of setback distances, but assuming that sites develop to their maximum, setbacks get smaller).
- Within the industrial zones, setbacks remained the same (assuming maximum development occurs).

Please note the above density analysis includes the following modifications to the building types allowed within the NG, NG-P, NG-R, and NE zones (Neighborhood General, Neighborhood General Preservation, Neighborhood Revitalization, and Neighborhood Edge zones) as follows:

NG ZONE
~~Hybrid Court~~ (Hybrid Court deleted)
~~Court~~ (Court deleted)
~~Live-Work~~ (Live-Work deleted)
~~Rowhouse~~ (Rowhouse deleted)
Bungalow Court
Rosewalk
Duplex/Triplex/Quadplex
Single Dwelling
Carriage House

NG-P ZONE
~~Bungalow Court~~ (Bungalow Court deleted)

~~Rosewalk~~ (Rosewalk deleted)
Duplex, Triplex, Quadplex,
Single Dwelling
Carriage House

NG-R ZONE
~~Hybrid Court~~(Hybrid Court deleted)
Court
Rowhouse
Bungalow Court
Rosewalk
Duplex/Triplex/Quadplex
Single Dwelling
Carriage House

NE ZONE
Bungalow Court (Court changed to Bungalow Court)
Single Dwelling
Carriage House

The reasons for these changes are:

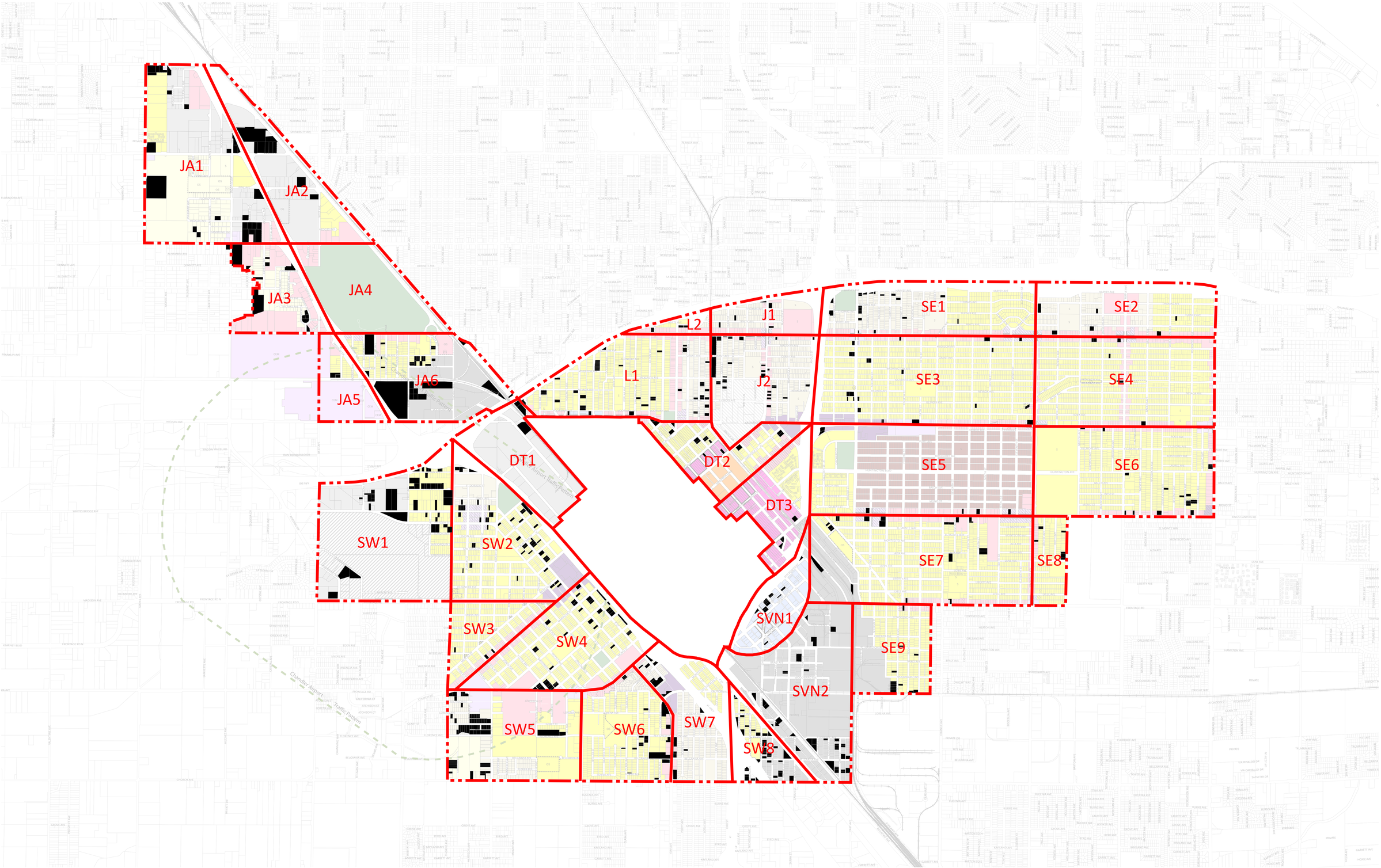
- Change, as described in the vision of the Fulton Corridor Specific Plan (FCSP) and DNCP, is concentrated in the FCSP area. The Market Report generated by Strategic Economics supports this vision of change.

- The goal is to infill the DNCP neighborhoods with buildings that are house-like in form.
  In the case of the NG zone, the Hybrid Court, Court, Live-Work, and Rowhouse types are buildings comprised of attached multi-family units that could potentially overwhelm the many single-family house building types that currently populate these neighborhoods. These multi-family types are better suited along the corridors. Though Duplexes, Triplexes, and Quadplexes contain multiple units, these building types are conceived as single-family houses that happen to contain two, three, or four units. Similarly, Bungalow Courts are composed of several single family buildings built grouped around a shared open space.
  The NG-P zone applies generally to areas that are well built out with well-preserved single-family buildings (such as along Huntington Boulevard). Developing the Rosewalk and Bungalow Court building types would require assembling two lots, a practice that should be avoided in the these well-preserved neighborhoods.
  The NE zone is conceived as a lower density zone that is rural in character. Accordingly, the allowed building types have been changed to detached single family types: single dwellings and bungalow courts.

- Increasing density in the NG, NG-P, and NE zones means that water and sewer pipes might need to be increased in size in order to support wastewater flows and fire flow. Based upon the findings of Strategic Economics' Market Report (that very little development activity will occur in the neighborhoods), infrastructure upgrades should be concentrated in the FCSP area. In addition, the FCSP area has some of the oldest infrastructure in the City (some as old as 70 years), infrastructure that should be replaced before other infrastructure is replaced.

Administrative Draft – Confidential – For Review by City Staff and City's Retained Consultants Onlya

Appendix 5: Downtown Community Plan Unit Count by Superblock



City of Fresno, California
Fulton Corridor Specific Plan and
Downtown Neighborhoods Community Plan
23 November 2011
© moule & polyzoides

Unit Count Comparison

Moule & Polyzoides
Architects and Urbanists

Appendix 6: Water Distribution Network Model

WEST YOST ASSOCIATES

REGISTERED PROFESSIONAL ENGINEER
CHARLES DUNCAN
No. 55498
EXP. 12-31-12
CIVIL
STATE OF CALIFORNIA

TECHNICAL MEMORANDUM

DATE: July 22, 2011 Project No.: 439-02-10-07

TO: Brock Buche, City of Fresno Water Division Project Manager
Martin Querin, City of Fresno Assistant Public Utilities Director—Water Division

FROM: Brenda Estrada, Project Engineer, R.C.E. #67062
Elizabeth Drayer, Project Engineer, R.C.E. #46872

REVIEWED BY: Charles Duncan, Project Manager, R.C.E. #55498

SUBJECT: Hydraulic Evaluation of the Proposed Fulton Corridor Specific Plan Project

INTRODUCTION

The purpose of this memorandum is to present West Yost Associates' (West Yost's) evaluation of the potential hydraulic impacts on the City of Fresno (City) water system of the proposed Fulton Corridor Specific Plan Project (Proposed Project) located in the City's downtown area. As described in this memorandum, West Yost has used the City's water system hydraulic model to evaluate the ability of the City's existing water system to provide minimum required pressures and flows under the future, projected demands associated with the buildout of the Proposed Project. Our findings and recommendations for water system infrastructure improvements to serve the Proposed Project are described below.

PROJECT DESCRIPTION

The Proposed Project is located in the City's Downtown area and encompasses several distinct center city areas (districts) including the Central Business District, the Cultural Arts District, the South Stadium zone, and Chinatown. As shown on Figure 1, the approximate boundaries of the Proposed Project are East Divisadero Street to the north, N and O Streets to the east, Highway 41 to the south, and Highway 99 to the west. In all, the combined Proposed Project area comprises approximately 440 acres and includes a mix of multi-family residential, industrial mixed use, office and retail land uses.

As described below, three different land use development scenarios for the Proposed Project have been evaluated by Sherwood Design Engineers (Sherwood) based on a range of Floor Area Ratio (FAR) assumptions. The total building area for the three development scenarios ranges from 5.2 million square feet for the minimum proposed FAR scenario to 14.1 million square feet for the maximum proposed FAR scenario.

PROJECTED WATER DEMANDS

The analysis of the potable water demand within the Proposed Project was performed by Sherwood[1]. The demand analysis utilized the proposed building areas and FARs as developed by Moule & Polyzoides (M&P) and the Project planning team. The water demands were calculated for each development scenario using water demand rates based on built area per land use types. Unit water use factors were based on the increased densification and proposed land uses for underutilized parcels included in each district within the Proposed Project area and were taken from Sherwood's existing internal data/research and cross-referenced with the City of Oakland's land use demand values[2]. Proposed average daily flow rates per district were calculated as weighted averages based on M&P's distribution of land uses within each district.

Table 1 provides a summary of the unit water use factors used by Sherwood for each district for the evaluation.

Table 1. Summary of Unit Water Use Factors Used for Proposed Project

District	Unit Water Use Factor, gallons per day per 1,000 square feet
Central Business District 1 (CBD1)	204
Central Business District 2 (CBD2)	202
Civic Center	210
Chinatown District	196
Cultural Arts/South Stadium District	192
Chinatown Industrial District	150
Town Center	210
Neighborhood General	200
Neighborhood General Preservation	200
Special District	130

Source: Sherwood Design Engineers Water Demand Calculations received May 23, 2011 (FCSP_Water_Analysis_110513.pdf) (Water_Flow_SP.xlsx).

Three development scenarios were evaluated by Sherwood:

- A minimum buildout scenario (minimum FAR),
- A median buildout scenario (median FAR), and
- A maximum buildout scenario (maximum FAR).

---

1 Sherwood Design Engineers Water Demand Calculations received May 23, 2011 (FCSP_Water_Analysis_110513.pdf) (Water_Flow_SP.xlsx).

2 The data available for the City of Oakland was based on estimated wastewater flows for various types of development. To back-calculate water use based on this data, the estimated wastewater flows were multiplied by a factor of 1.20 to account for consumptive water uses which do not result in wastewater flows.

Table 2 provides a summary of the calculated water demands for the three development scenarios evaluated by Sherwood for the Proposed Project. Demands were calculated for underutilized parcels within the Proposed Project area, such that the calculated additional demand represents the projected demand associated with the Proposed Project for various FAR scenarios. Based on the current land use of the underutilized parcels, the existing demand was estimated at 170,822 gallons per day (gpd), or 191 acre-feet per year (af/yr). The estimated water demands on other parcels within the Proposed Project were assumed not to change. A copy of Sherwood's water demand calculation spreadsheet showing the calculated water demand for each underutilized parcel for each development scenario is provided in Attachment 1.

Table 2. Summary of Projected Water Demand for Various Development Scenarios

Development Scenario	Total Projected Building Area on Underutilized Parcels, square feet	Existing Demand on Underutilized Parcels, gpd	Additional Demand on Underutilized Parcels as a result of Proposed Project, gpd	Total Demand on Underutilized Parcels within Proposed Project Area, gpd	Total Existing Demand on All Parcels within Proposed Project Area, gpd	Total Demand within Proposed Project Area, gpd
		[1]	[2]	[3] = [1] + [2]	[4]	[5] = [2] + [4]
Minimum Buildout Scenario (Minimum FAR)	5,240,428	170,822	870,835	1,041,656	683,983	1,554,818
Median Buildout Scenario (Median FAR)	9,572,280	170,822	1,733,744	1,904,565	683,983	2,417,727
Maximum Buildout Scenario (Maximum FAR)[(a)]	14,123,642	170,822	2,637,503	2,808,324	683,983	3,321,486

Source: Sherwood Design Engineers Water Demand Calculations received May 23, 2011 (FCSP_Water_Analysis_110513.pdf) (Water_Flow_SP.xlsx).

[(a)] The Maximum Buildout Scenario (Maximum FAR) is the basis for West Yost's analysis.

For purposes of West Yost's hydraulic evaluation of the Proposed Project, West Yost has evaluated the water demands associated with only the maximum buildout (maximum FAR) development scenario which equate to an additional average day demand of approximately 2.6 million gallons per day, which equals an additional annual demand of 2,955 af/yr.

Figure 2 shows the projected demands by parcel within the Proposed Project area for the maximum buildout development scenario.

WATER SUPPLY

As described in the City's Metro Plan Update, the City's Water Master Plan, and West Yost's March 2009 Technical Memorandum "Hydraulic Evaluation of the Downtown Central Area," the City's available water supplies are limited to a finite quantity and are extremely limited. As shown in Table 2, the estimated annual demand for the maximum buildout scenario for the Proposed Project will further increase required water supplies by an additional 2,955 af/yr. Water supplies to meet this estimated additional demand must come from within the City's existing, limited water supply portfolio and may need to be "imported" from other parts of the City and/or require reduced water use (additional water conservation) in other parts of the City.

Water supplies for the Proposed Project will probably need to be evaluated as part of an SB 610 Water Supply Assessment to evaluate the availability and reliability of the City's water supplies to meet the projected increased water demands of the Proposed Project under various hydrologic conditions and whether these demands were anticipated as part of the City's most recent Urban Water Management Plan.

EVALUATION CRITERIA

Planning and Modeling Criteria

The planning and modeling criteria used for this evaluation are based on West Yost's recent work with the City. The August 2008 verified hydraulic model of the City's water distribution system was used as the basis for the evaluation. The criteria used to evaluate the potential impacts to the City's existing water system are as follows:

- Minimum peak hour demand pressure 40 pounds per square inch (psi);
- Maximum allowable velocity is 7 feet per second (fps) during a peak hour condition;
- Maximum day plus fire flow residual pressure at the flowing hydrant must be equal to or greater than 20 psi;
- Maximum allowable velocity is 10 fps during the simulated fire flow condition[3];
- Maximum allowable head loss rate is 10 feet per 1,000 feet during any condition[4];
- Any new, required pipelines will be modeled with a roughness coefficient (C-factor) of 130;

[3] This criteria was developed primarily for new development; ability to meet this criteria within existing distribution systems (such as that in the City's downtown area) can be difficult due to existing small diameter pipelines and aging pipelines.

[4] This criteria was developed primarily for new development; ability to meet this criteria within existing distribution systems (such as that in the City's downtown area) can be difficult due to existing small diameter pipelines and aging pipelines.

- Assumed peaking factors for maximum day and peak hour demand conditions are consistent with the City's adopted peaking factors and are as follows:
  - Maximum Day Demand = 2.0 times Average Day Demand
  - Peak Hour Demand = 2.9 times Average Day Demand

Fire Flow Requirements

Fire flow requirements based on proposed land use for each parcel were determined by Sherwood and were based on the California Building Code (CBC) and the 2007 California Fire Code (CFC) (Table B105.1). Sherwood assumed maximum potential building footprints for each parcel and assumed CBC construction type (IA, IIIB, etc.) for each land use zone based on the building type with the maximum FAR. Based on this methodology, fire flow requirements of up to 6,250 gallons per minute (gpm) for a four-hour duration were identified for some of the parcels. The projected fire flow requirements by parcel are shown on Figure 3. A copy of Sherwood's fire flow calculation spreadsheet showing the calculated fire flow requirement by parcel is provided in Attachment 2.

Some of the larger buildings included in the Proposed Project will be fully sprinklered which results in a reduction of the required fire flow. Therefore, based on direction received from Byron Beagles (City of Fresno Fire Prevention Engineer), a fire flow requirement of 3,500 gpm for a four-hour duration with a minimum 20 psi residual pressure will be assumed for the Proposed Project[5].

It should be noted that evaluated fire flows and residual pressures are based on ground surface elevations, and do not account for required minimum water service pressures on higher floors in multi-story buildings. As such, utility system designs for some buildings within the Proposed Project may require the provision of booster pumps to provide adequate water service pressures on higher floors and for fire suppression systems.

Although these criteria have been established, and used to size new pipelines, the existing system in the City's downtown area should be evaluated using pressure as the primary criterion. Secondary criteria, such as velocity, head loss, age, and material type, are used as indicators for areas of the water system that also may need improvements, but may not be required as part of this evaluation.

[5] February 6, 2011 e-mail from Byron Beagles to Brock Buche, re: Fire Flow Requirements.

WATER SYSTEM FACILITY ASSUMPTIONS

Recommendations from Previous Evaluations

In March 2009, West Yost completed a hydraulic evaluation of the Downtown Central Area to evaluate available supplies in the City's downtown area and address the loss of supply in the downtown area due to aging wells and water quality issues[6]. The following recommendations for water system improvements were made:

- Additional storage to increase system reliability during peak hour and fire flow conditions;
- Replacement or rehabilitation of Wells 1A and 21A;
- Upgrade of Well 172 pumping capacity along with associated distribution system improvements from Well 172 to the City's downtown area; and
- Addition of 24-inch and 16-inch diameter pipelines through the Central Area to support integrating surface water supply from the east and continuing the City's goal of developing opportunities to transition their predominate groundwater supply to a more balanced conjunctive use system.

In May 2011, West Yost conducted a re-evaluation of the Downtown Central Area to determine what potential alternatives existed other than the March 2009 recommendation for increasing the pumping capacity of Well 172[7]. The recommendations of the May 2011 evaluation were to make distribution pipeline improvements to improve flow from Well 172 (as recommended in the March 2009 evaluation), but instead of upgrading the pumping capacity of Well 172, distribution system improvements should be made to convey supplies from Well 313 to the Downtown Central Area.

For purposes of this evaluation, it has been assumed that the pipeline and storage infrastructure recommendations from these prior hydraulic evaluations of the Downtown Central Area without the pumping capacity increase of Well 172 will be implemented by the City and will be available to serve the Proposed Project.

Specific Facility Assumptions

The following specific assumptions have been made related to available water system facilities and other water demands within the City's service area:

- Wells 1A and 21A in the City's downtown area (located just northeast of the Proposed Project) area are assumed to be inactive;

---

[6] "Hydraulic Evaluation of the Downtown Central Area", Technical Memorandum, prepared by West Yost Associates, March 12, 2009.

[7] "Hydraulic Re-Evaluation of the Downtown Central Area Water Distribution System", Technical Memorandum, prepared by West Yost Associates, May 10, 2011.

- New Well 1B (located just outside the City's downtown area) is assumed to be operational and active (recommended as part of West Yost's March 2009 Hydraulic Evaluation of the Downtown Central Area as a replacement for Wells 1A and 21A);
- The new 3.0 million gallon (MG) Downtown tank and associated pipelines (along Nielsen Avenue and G Street) (currently under design) are assumed to be operational (recommended as part of West Yost's March 2009 Hydraulic Evaluation of the Downtown Central Area);
- The distribution system improvements from Well 172 to the Central Area are assumed to be operational. The associated distribution system improvements include a new 16-inch diameter pipeline south along Hughes Avenue and a new 24-inch diameter pipeline along Nielsen Avenue to convey supplies from Well 172 to the Central Area (recommended as part of West Yost's March 2009 Hydraulic Evaluation of the Downtown Central Area);
- A 12-inch diameter connection at West Avenue to the 24-inch diameter pipeline in Nielsen Avenue to convey supplies from Well 313 to the Central Area is assumed to be operational (recommended as part of West Yost's May 2011 Hydraulic Re-Evaluation of the Downtown Central Area Water Distribution System);
- New 24-inch and 16-inch diameter pipelines through the Central Area along G Street, Ventura Street, O Street and Stanislaus Street are assumed to be operational to support integrating surface water supply from the east and continuing the City's goal of developing opportunities to transition their predominate groundwater supply to a more balanced conjunctive use system (recommended as part of West Yost's March 2009 Hydraulic Evaluation of the Downtown Central Area);
- The new Chestnut Avenue transmission pipeline from the City's Northeast Surface Water Treatment Facility (SWTF) is assumed to be operational;
- The regional Transmission Grid Mains (TGMs) are included and assumed to be operational;
- Future water demands in the southwest part of the City service area are included (per June 8, 2011 e-mail from Brock Buche, the City's Development Department has indicated that development in the southwest part of the City will occur concurrently with the Proposed Project);
- The proposed new Southeast SWTF is <u>not</u> included; and
- Future water demands associated with the Southeast Growth Area (SEGA) are <u>not</u> included.

The City's assumed water system facilities available to serve the Proposed Project in the downtown area are shown on Figure 4.

EVALUATION SCENARIOS

As described above, only the maximum buildout (maximum FAR) development scenario of the Proposed Project has been analyzed by West Yost for this evaluation; no other development scenarios or phasing plans were evaluated.

To evaluate the adequacy of the City's water system to serve the Proposed Project, West Yost has evaluated buildout of the Proposed Project under the following two demand conditions:

- A future maximum day demand condition concurrent with a 3,500 gpm fire flow demand while maintaining a minimum residual system pressure of 20 psi; and
- A peak hour demand condition while maintaining a minimum system pressure of 40 psi.

EVALUATION FINDINGS

Storage Capacity Evaluation

Treated water storage capacity requirements for the City were evaluated based on the following three components: operational storage, emergency storage and fire storage. The principal advantage that storage provides is to equalize demands on supply sources and production facilities. The City's Metro Plan Update and Water Master Plan both indicate a need for water storage in the City's downtown area.

West Yost's March 2009 evaluation of the City's Central Area recommended that approximately 3 million gallons (MG) of storage be constructed in the City's Central Area to increase system reliability during peak hour and fire flow conditions. As described above, a new 3 MG Downtown Tank is currently under design and is assumed to be operational for the purposes of this evaluation. However, the required storage capacity previously calculated for the City's Central Area did not take into account the increased densification associated with the Proposed Project. This increased densification will increase the need for storage in the City's Downtown area. Table 3 shows the increased storage requirement attributed to the increased demands associated with the Proposed Project.

Table 3. Additional Storage Required Due to Densification Associated with Proposed Project

Storage Component	Required Storage based on Current Buildout of Fulton Corridor Area without Proposed Project, MG	Required Storage based on Current Buildout of Fulton Corridor Area with Proposed Project, MG	Increased Storage Requirement Attributed to Proposed Project, MG
Operational: Equal to 25% of the Maximum Day Demand	1.17	1.65	0.48
Emergency: Equal to Average Day Demand	2.33	3.30	0.96
Fire Flow: Equal to the highest fire flow demand for an area multiplied by the required duration.	0.84	0.84	0.00
Total	4.34[(a)]	5.78	1.45

[(a)] The storage requirement shown for buildout of the Fulton Corridor Area without the Proposed Project (4.34 MG) is part of required storage previously calculated for the Downtown Central Area. As described in West Yost's March 2009 Hydraulic Evaluation of the Downtown Central Area, required storage within the Downtown Central Area was previously calculated to 8.3 MG, which will be met by a combination of groundwater credits (5.2 MG) and a new Downtown storage tank (3.0 MG). These previous storage calculations for the Downtown Central Area did not include the Proposed Project described in this technical memorandum.

As shown in Table 3, the additional storage requirement resulting from the increased densification associated with the Proposed Project is 1.45 MG.

As described in West Yost's March 2009 evaluation of the City's Central Area, water storage within the City is considered on a regional basis with the water storage requirements for the downtown area being a portion of the overall system requirements. The City's Water Master Plan is evaluating the overall system and will make recommendations for overall system improvements, including recommendations for storage improvements. The 3.0 MG Downtown tank (currently being designed) does not provide adequate capacity for the additional storage required for the Proposed Project, therefore additional operational and emergency storage will need to be provided within the City's overall system to meet the storage needs for the Proposed Project.

Pumping Capacity Evaluation

Along with the increased storage due to the demand densification, the City will require additional pumping capacity for the Proposed Project to meet operational demands. The operational pumping requirements are used to help meet the City's performance criteria during peak demand conditions. The pumping capacity for fire flow has been accounted for on a regional basis and will not increase as a result of the densification. Emergency pumping capacity is based on an average day demand and is generally met by wells and pump stations equipped with auxiliary power. The recommended pumping required to serve the operational needs of the Proposed Project is approximately 1.44 mgd (1,000 gpm). This increased pumping capacity will need to be added within the City's overall system to meet peak demand operations.

Distribution System Evaluation

The City's existing water system hydraulic model was modified by West Yost to be representative of the projected water demands associated with the maximum buildout (maximum FAR) development scenario of the Proposed Project. The estimated future demands were distributed throughout the Proposed Project area, as appropriate, according to the proposed development plans.

The future buildout system with the Proposed Project, and the previously recommended Downtown Central Area water system infrastructure improvements described above, was evaluated under maximum day demand plus fire flow conditions and peak hour demand conditions. The evaluation results are described below.

The results of the maximum day demand plus fire flow condition for the future buildout system with the Proposed Project are shown on Figure 5. Figure 5 shows the available flow at each node in the hydraulic model assuming that a minimum system pressure of 20 psi is maintained. Nodes that are shown in "green" have available flows of 3,500 gpm or more, indicating that they meet the fire flow requirement for the Proposed Project. Nodes shown in "red" have available flows that are less than 3,500 gpm, indicating that they do not meet the fire flow requirement for the Proposed Project. As shown, in the northern part of the Proposed Project area, there are several locations where available flows are below the required minimum of 3,500 gpm (see "red" nodes on Figure 5); the lowest available flow in this area is 1,617 gpm. Similarly, there are several locations in the southern part of the Proposed Project area where available flows are below the required minimum of 3,500 gpm (see "red" nodes on Figure 5); the lowest available flow in this area is 1,497 gpm. It should also be noted that the City's pipeline velocity criteria of a maximum of 10 fps during a simulated fire flow condition is not being met in many locations within the Proposed Project area; however, this is expected due to the age and small diameter size of the existing pipelines in the downtown area. Therefore, infrastructure improvements will be required to meet the City's fire flow pressure and flow criteria (these recommendations are described below).

The results of the peak hour demand condition for the future buildout with the Proposed Project are shown on Figure 6. Figure 6 shows the system pressure at each node in the hydraulic model based on peak hour demand conditions. As shown, system pressures throughout most of the Proposed Project area are between 40 and 50 psi under buildout peak hour demand conditions (indicated by the "green" nodes), and some are between 50 to 60 psi (indicated by the "blue" nodes). Therefore, the City's minimum peak hour pressure criteria of 40 psi is being met throughout the Proposed Project area and no specific improvements are required for the peak hour demand condition.

EVALUATION RECOMMENDATIONS

Figure 7 shows the following recommended infrastructure improvements to resolve the fire flow deficiencies described above as a result of the increased water demands associated with the Proposed Project. The recommended improvements include the replacement of existing smaller diameter pipelines with 8-inch diameter pipelines (approximately 1,400 linear feet in total) and the installation of new 8-inch diameter pipelines where pipelines did not previously exist

(approximately 7,660 linear feet in total). A table listing the proposed pipeline improvements by street is provided as Attachment 3.

Also, as described below, West Yost recommends that an additional 1.5 MG of storage be located within the City's overall water system to meet the operational and emergency storage needs of the Proposed Project.

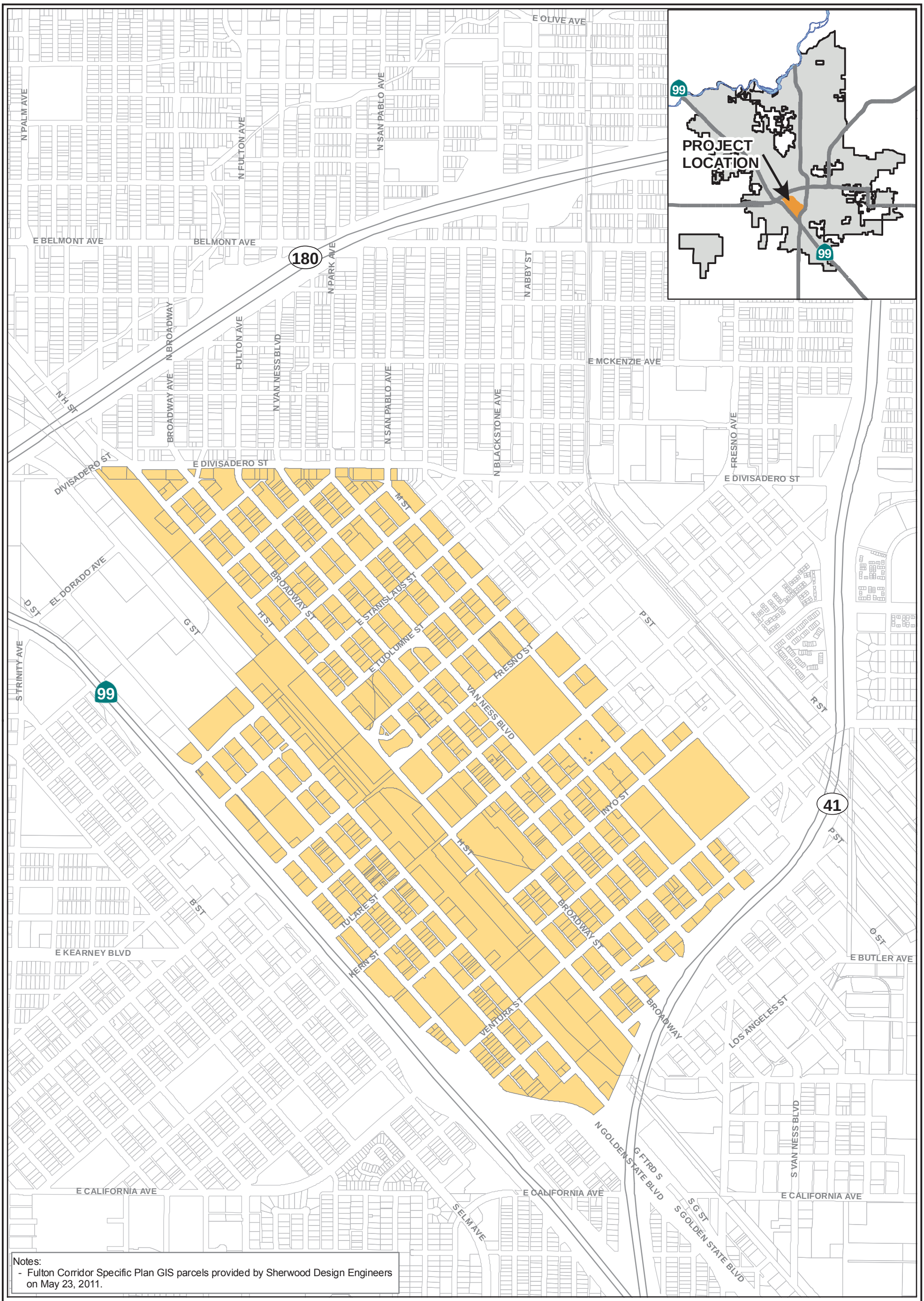
Figure 8 shows the maximum day demand plus fire flow scenario with the Proposed Project with the recommended pipeline improvements as listed above. As shown, with the recommended improvements, the fire flow requirement of 3,500 gpm is met throughout the entire Proposed Project area, with the exception of the following two locations:

- G Street (just north of Stanislaus Street): The available fire flow at this location is 1,972 gpm. This node is located at the end of an approximately 440 foot long, 8-inch diameter pipeline (which appears to be a hydrant lateral). Flows from this location could be combined with flows from other nearby hydrants to provide the fire flow requirement of 3,500 gpm for the Proposed Project.
- Mono Street (just east of E Street): The available fire flow at this location is 2,140 gpm. This location has smaller parcels and no proposed multi-story buildings, therefore, this available fire flow appears to be adequate for this area. Also, flows from this location could be combined with flows from other nearby hydrants to provide the fire flow requirement of 3,500 gpm for the Proposed Project.

It should be noted that the City's pipeline velocity criteria of a maximum of 10 fps during a simulated fire flow condition is still not being met in many locations within the Proposed Project area, even with the recommended improvements described above and shown on Figure 7; however, this is expected due to the age and small diameter size of the existing pipelines in the downtown area. Because fire flow pressure and flow requirements are being met, this velocity criteria, by itself, is not considered as being critical enough to require replacement of additional existing pipelines with larger diameter pipelines in the downtown area.

Figure 9 shows the peak hour demand scenario with the Proposed Project with the recommended improvements. As noted above, no specific improvements were required for the peak hour demand condition for the Proposed Project. Similar to the peak hour results shown in Figure 6, the minimum peak hour system pressure of 40 psi is met throughout the entire Proposed Project area.

An estimation of probable construction costs for these recommended water system infrastructure improvements to serve the Proposed Project was not included in West Yost's Scope of Work for this evaluation. However, these cost estimates can be provided if requested and if a budget augmentation is approved by the City.



Notes:
- Fulton Corridor Specific Plan GIS parcels provided by Sherwood Design Engineers on May 23, 2011.

LEGEND

Fulton Corridor Specific Plan

N

0 500 1,000

Scale in Feet

FIGURE 1

City of Fresno

Fulton Corridor Hydraulic Analysis

PROJECT LOCATION

WEST YOST ASSOCIATES
Consulting Engineers

O:\Clients\439_Fresno\02-10-07 Fulton Corridor Specific Plan Water Infrastructure Evaluation\GIS\Figures\Figure 1 Location.mxd 6/28/2011

Notes:
- Demand projections based on Sherwood Design Engineers provided data (5/13/2011).
- Shown demands are based on the maximum proposed FAR.
- Proposed densification demands are only calculated for underutilized parcels. All other parcels are assumed not to change.

LEGEND

Fulton Corridor Projected Demands

- 0 - 5,000 gpd
- 5,001 - 10,000 gpd
- 10,001 - 20,000 gpd
- 20,001 - 30,000 gpd
- 30,001 - 286,209 gpd

N

0 500 1,000

Scale in Feet

FIGURE 2

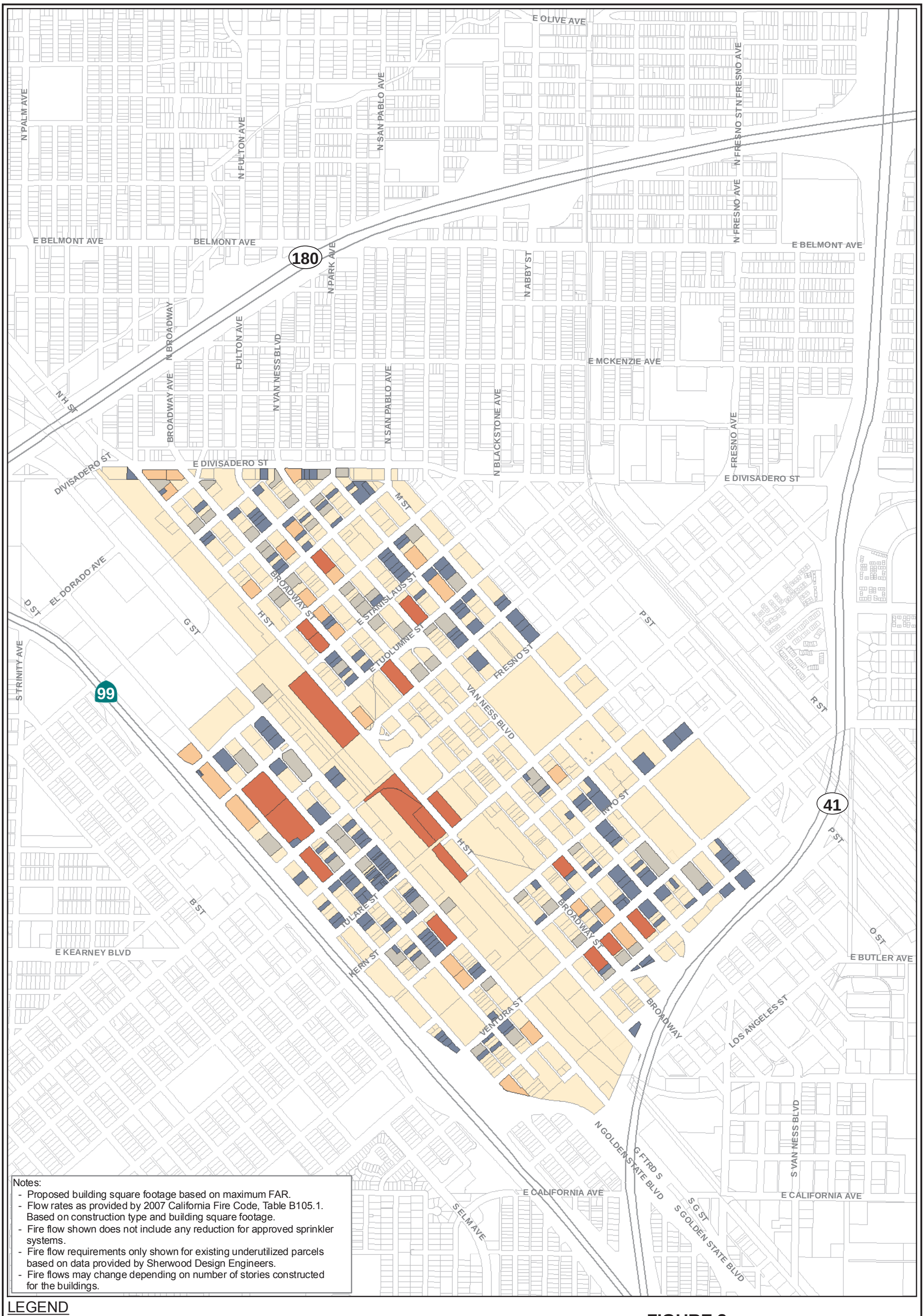
City of Fresno

Fulton Corridor Hydraulic Analysis

PROJECTED DEMAND DENSIFICATION

WEST YOST ASSOCIATES
Consulting Engineers

O:\Clients\439_Fresno\02-10-07 Fulton Corridor Specific Plan Water Infrastructure Evaluation\GIS\Figures\Figure 2 Ex System.mxd 6/28/2011



Notes:
- Proposed building square footage based on maximum FAR.
- Flow rates as provided by 2007 California Fire Code, Table B105.1. Based on construction type and building square footage.
- Fire flow shown does not include any reduction for approved sprinkler systems.
- Fire flow requirements only shown for existing underutilized parcels based on data provided by Sherwood Design Engineers.
- Fire flows may change depending on number of stories constructed for the buildings.

LEGEND

Underutilized Parcel Fire Flow

- 1,500 - 3,000 gpm
- 3,001 - 4,000 gpm
- 4,001 - 5,000 gpm
- 5,001 - 6,500 gpm
- Fire Flow not updated

N

0 500 1,000

Scale in Feet

FIGURE 3

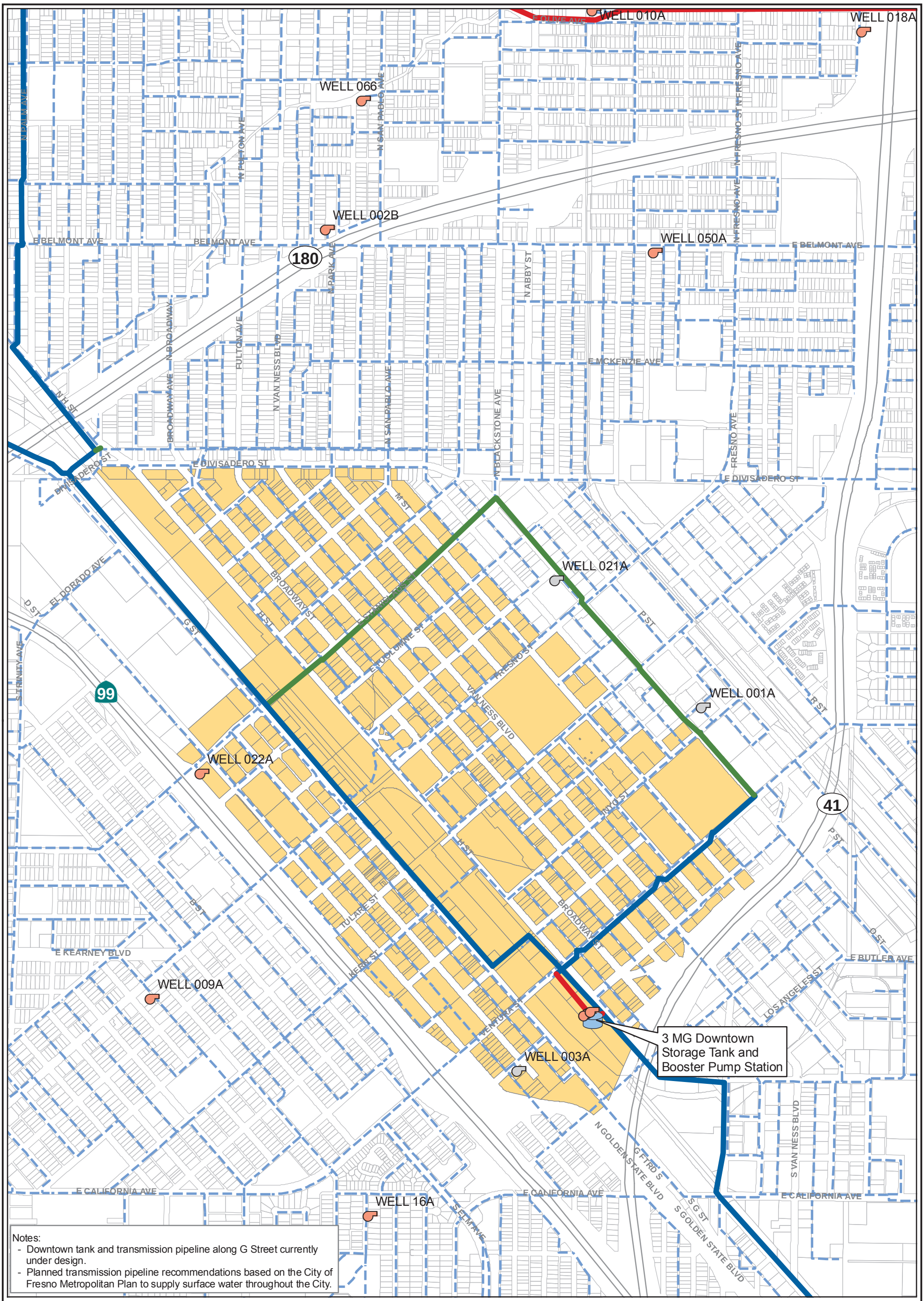
City of Fresno

Fulton Corridor Hydraulic Analysis

PROJECTED FIRE FLOW REQUIREMENTS

WEST YOST ASSOCIATES
Consulting Engineers

O:\Clients\439_Fresno\02-10-07 Fulton Corridor Specific Plan Water Infrastructure Evaluation\GIS\Figures\Figure 3 Projected Fire Flow.mxd 6/28/2011



Notes:
- Downtown tank and transmission pipeline along G Street currently under design.
- Planned transmission pipeline recommendations based on the City of Fresno Metropolitan Plan to supply surface water throughout the City.

LEGEND

- Existing Pipelines
- **Planned Transmission Pipelines**
  - 12 inch diameter
  - 16 inch diameter
  - 24 inch diameter
  - 30 inch diameter
- Well/Pump Station
- Inactive Well
- Storage Tank
- Fulton Corridor SP

N

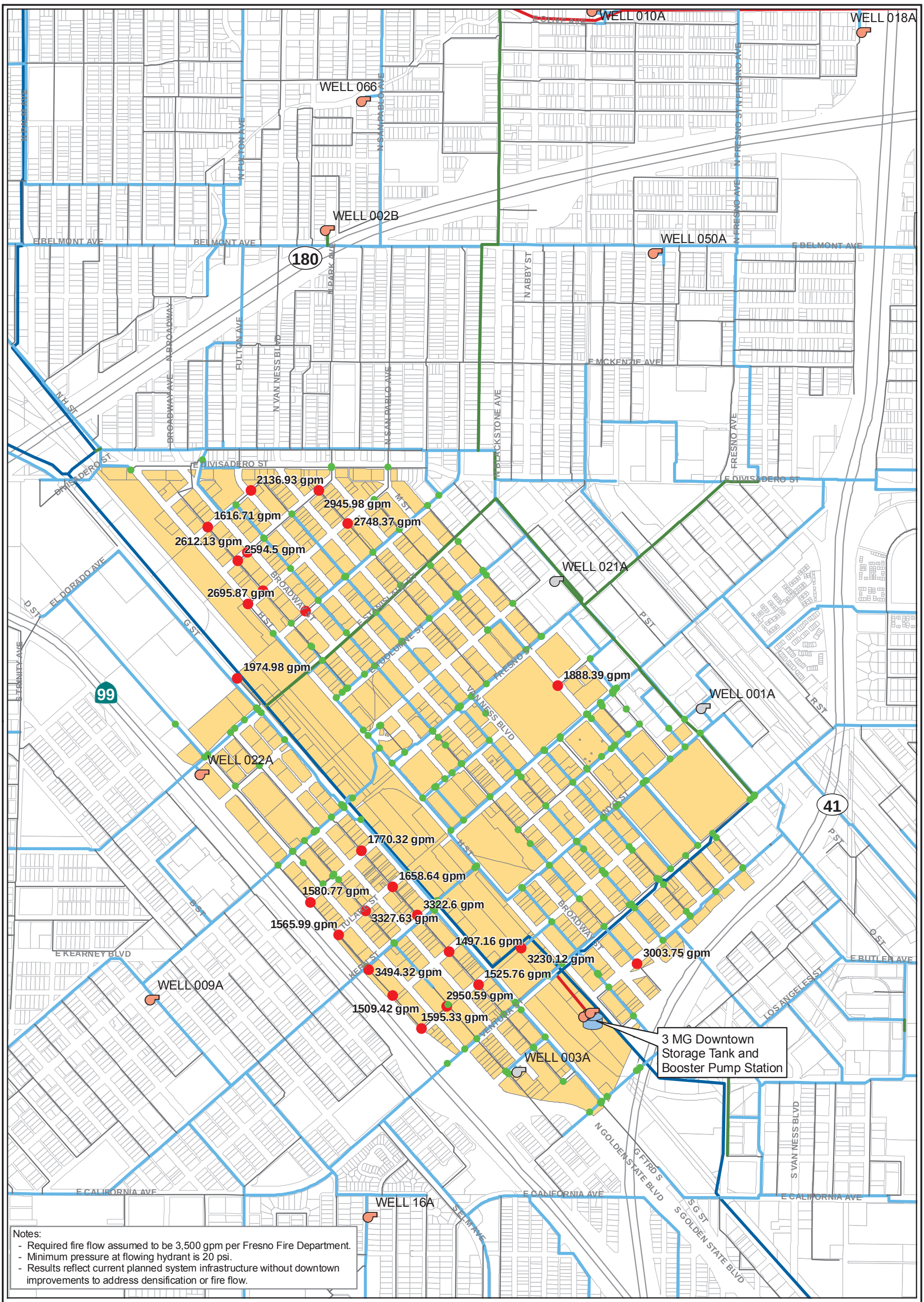
0 500 1,000
Scale in Feet

FIGURE 4

City of Fresno
Fulton Corridor Hydraulic Analysis
PLANNED BUILDOUT FACILITIES

WEST YOST ASSOCIATES
Consulting Engineers

O:\Clients\439_Fresno\02-10-07 Fulton Corridor Specific Plan Water Infrastructure Evaluation\GIS\Figures\Figure 4 Bo System.mxd 7/1/2011



Notes:
- Required fire flow assumed to be 3,500 gpm per Fresno Fire Department.
- Minimum pressure at flowing hydrant is 20 psi.
- Results reflect current planned system infrastructure without downtown improvements to address densification or fire flow.

LEGEND

Available Flow @ 20 psi

- Less than 3,500 gpm
- Greater than 3,500 gpm
- Well/Pump Station
- Inactive Well
- Storage Tank

Pipe Diameters

- 6 to 8 inch
- 10 to 12 inch
- 14 to 16 inch
- 24 inch
- 30 inch

N

0 500 1,000
Scale in Feet

FIGURE 5

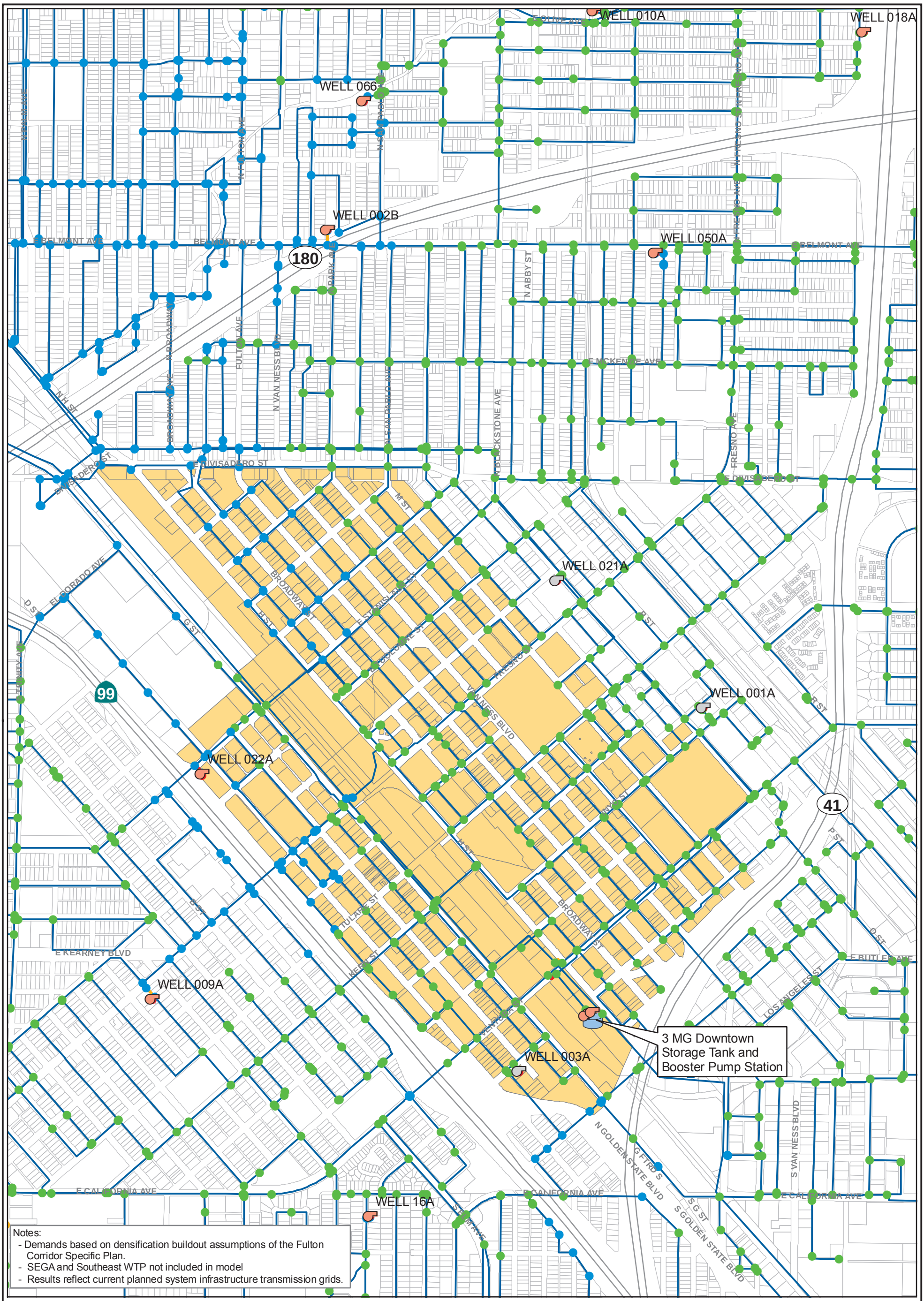
City of Fresno

Fulton Corridor Hydraulic Analysis

PROPOSED DENSIFICATION FIRE FLOW

WEST YOST ASSOCIATES
Consulting Engineers

O:\Clients\439_Fresno\02-10-07 Fulton Corridor Specific Plan Water Infrastructure Evaluation\GIS\Figures\Figure 5 Sw System FF.mxd 7/1/2011



Notes:
- Demands based on densification buildout assumptions of the Fulton Corridor Specific Plan.
- SEGA and Southeast WTP not included in model
- Results reflect current planned system infrastructure transmission grids.

LEGEND

System Pressure
- Less than 35 psi
- 35 to 40 psi
- 40 to 50 psi
- 50 to 60 psi
- 60 psi and Greater

Pipeline Velocity
- Less than 6 fps
- 6 to 7 fps
- 7 fps and Greater
- Well/Pump Station
- Inactive Well

- Storage Tank
- Fulton Corridor SP

N

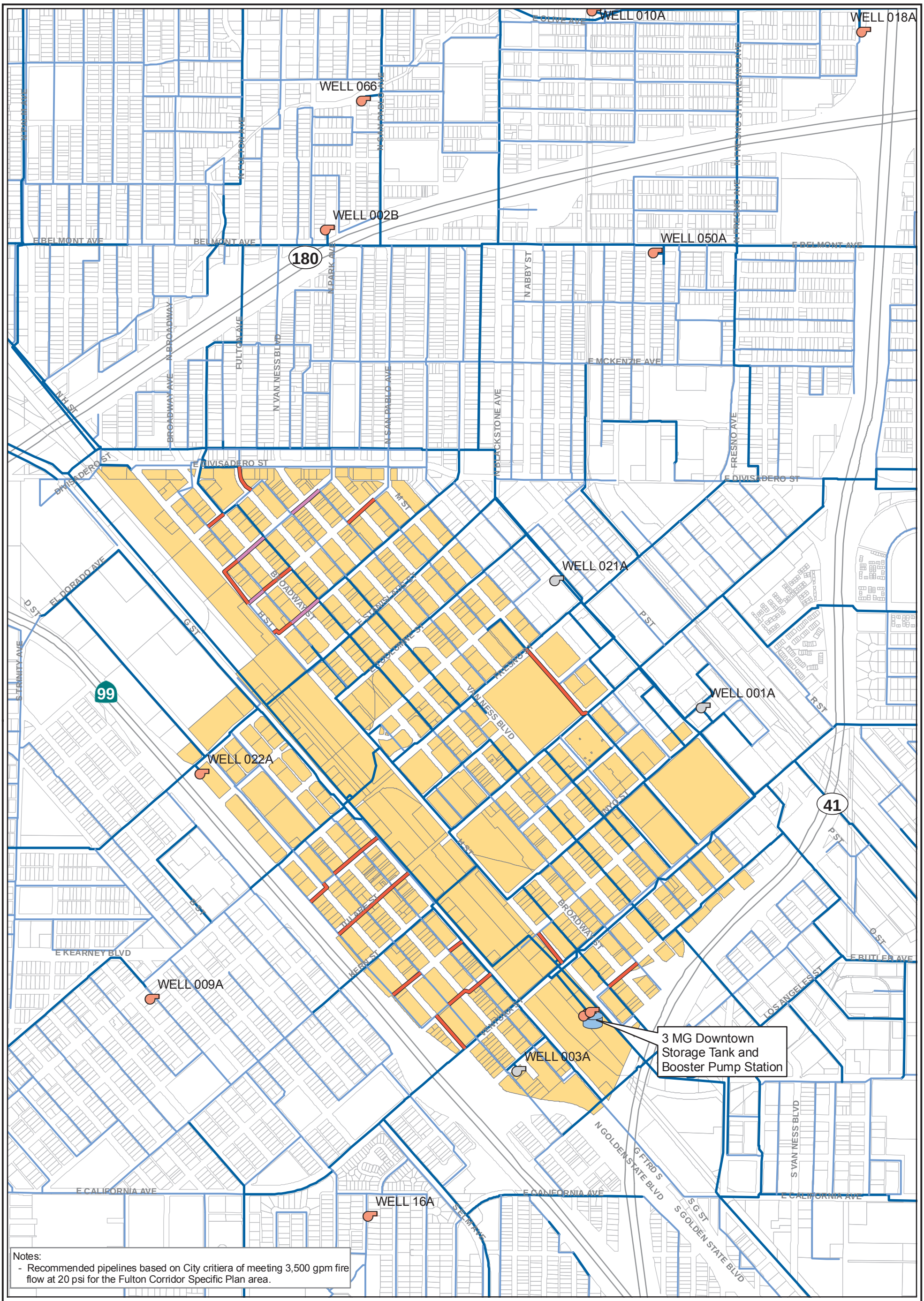
0 500 1,000
Scale in Feet

FIGURE 6

City of Fresno
Fulton Corridor Hydraulic Analysis
PROPOSED DENSIFICATION PEAK HOUR

WEST YOST ASSOCIATES
Consulting Engineers

O:\Clients\439_Fresno\02-10-07 Fulton Corridor Specific Plan Water Infrastructure Evaluation\GIS\Figures\Figure 6 Sw System Peak hour.mxd 7/1/2011



Notes:
- Recommended pipelines based on City critiera of meeting 3,500 gpm fire flow at 20 psi for the Fulton Corridor Specific Plan area.

LEGEND

Recommended Improvements

- New Pipeline (8 inch)
- Replacement Pipeline (8 inch)
- Well/Pump Station
- Inactive Well
- Storage Tank

Existing/Planned Pipeline

- Distribution (less than 12 inch)
- Transmission (12 inch and greater)

N

0 500 1,000

Scale in Feet

FIGURE 7

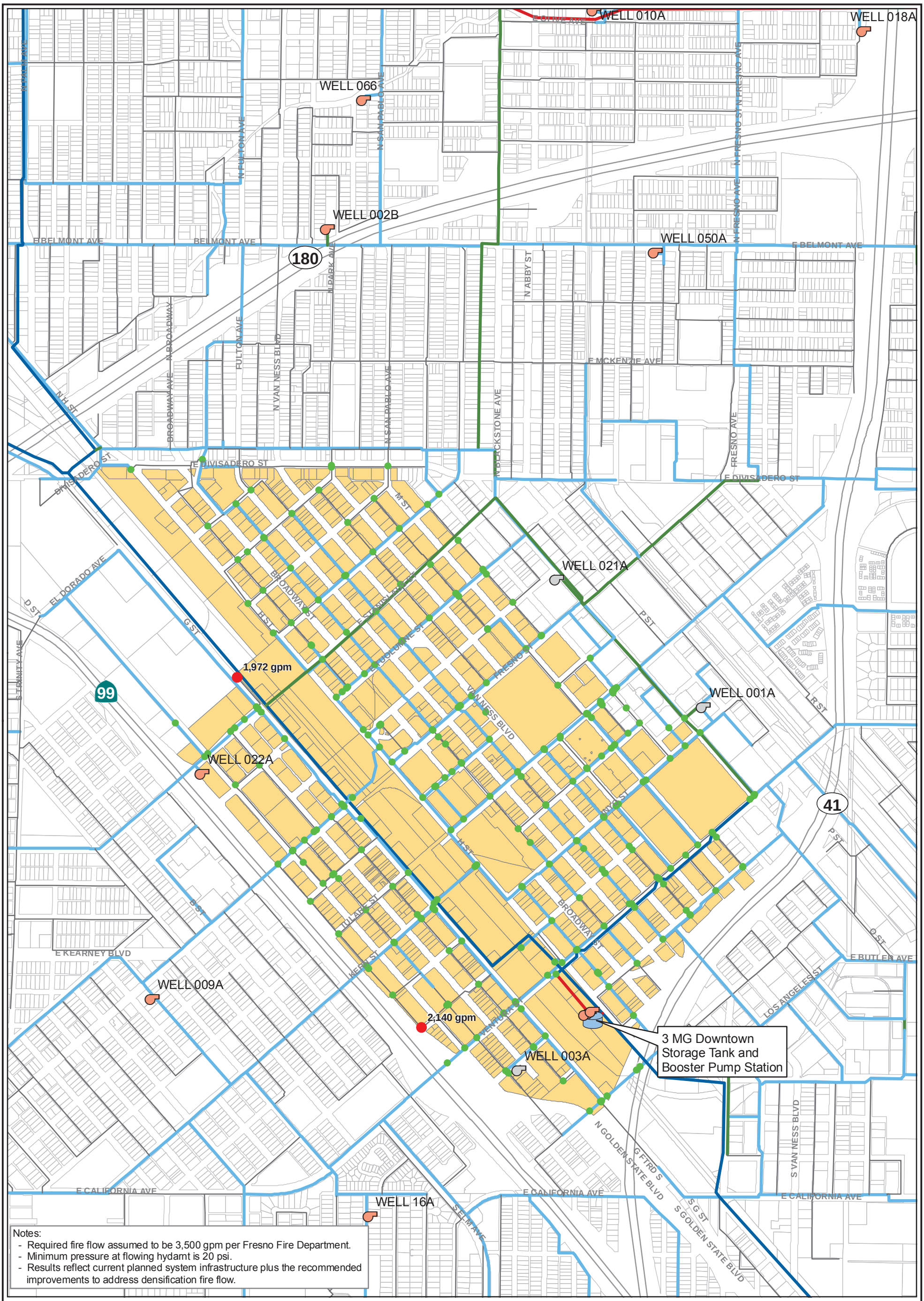
City of Fresno

Fulton Corridor Hydraulic Analysis

RECOMMENDED PIPELINE IMPROVEMENTS

WEST YOST ASSOCIATES
Consulting Engineers

O:\Clients\439_Fresno\02-10-07 Fulton Corridor Specific Plan Water Infrastructure Evaluation\GIS\Figures\Figure 7 Sw System Improvements.mxd 6/30/2011



Notes:
- Required fire flow assumed to be 3,500 gpm per Fresno Fire Department.
- Minimum pressure at flowing hydamt is 20 psi.
- Results reflect current planned system infrastructure plus the recommended improvements to address densification fire flow.

LEGEND

Available Flow @ 20 psi
- Less than 3,500 gpm
- Greater than 3,500 gpm
- Well/Pump Station
- Inactive Well
- Storage Tank

Pipe Diameters
- 6 to 8 inch
- 10 to 12 inch
- 14 to 16 inch
- 24 inch
- 30 inch

FIGURE 8

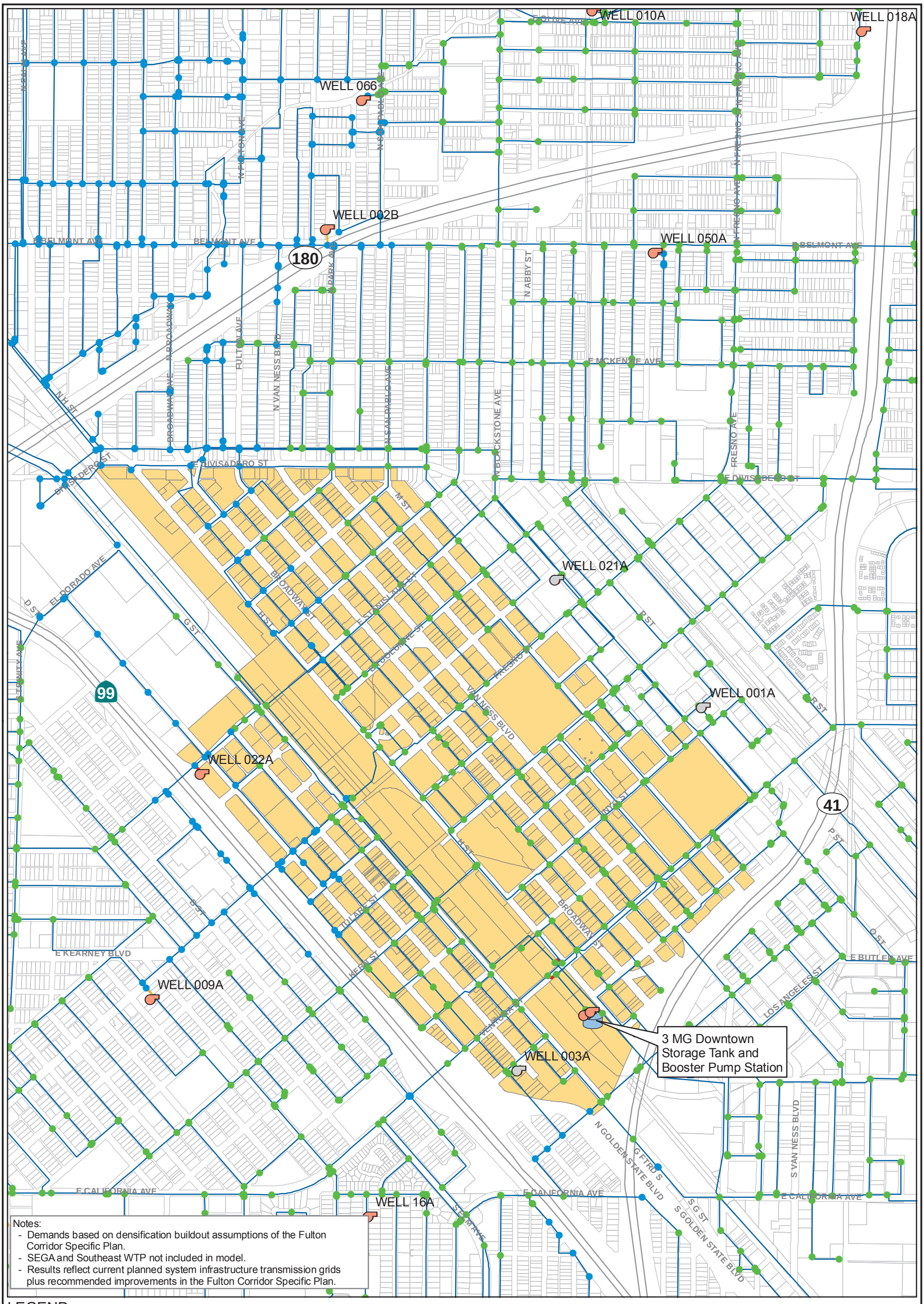
City of Fresno

Fulton Corridor Hydraulic Analysis

DENSIFICATION FIRE FLOW IMPROVEMENTS

WEST YOST ASSOCIATES
Consulting Engineers

O:\Clients\439_Fresno\02-10-07 Fulton Corridor Specific Plan Water Infrastructure Evaluation\GIS\Figures\Figure 8 Sw System FF Improvements.mxd 6/30/2011



Notes:
- Demands based on densification buildout assumptions of the Fulton Corridor Specific Plan.
- SEGA and Southeast WTP not included in model.
- Results reflect current planned system infrastructure transmission grids plus recommended improvements in the Fulton Corridor Specific Plan.

LEGEND

System Pressure
- Less than 35 psi
- 35 to 40 psi
- 40 to 50 psi
- 50 to 60 psi
- 60 psi and Greater

Pipeline Velocity
- Less than 6 fps
- 6 to 7 fps
- 7 fps and Greater
- Well/Pump Station
- Inactive Well

Storage Tank

N

0 500 1,000
Scale in Feet

FIGURE 9

City of Fresno

Fulton Corridor Hydraulic Analysis

DENSIFICATION PEAK HOUR IMPROVEMENTS

WEST YOST ASSOCIATES
Consulting Engineers

O:\Clients\439_Fresno\02-10-07 Fulton Corridor Specific Plan Water Infrastructure Evaluation\GIS\Figures\Figure 9 Sw System Peak hour Improvements.mxd 6/30/2011

ATTACHMENT 1

Sherwood Design Engineers Water Demand Projections

SHERWOOD Design Engineers

NOTES:

Existing Conditions

1) Existing parcel areas and land uses based on City of Fresno GIS dat
2) Existing water use was determined using land-based unit factors provided Table 6-4 of the UWMP, August 2008.

UWMP Water Demand Rates	Unit Factors (af/ac/yr)			Unit Factors (gpd/ac)		
	2005	2010	2025	2005	2010	2025
Single Family Residentia	3.8	3.5	3.2	3392	3124	2857
Multi-Family Residentia	6.5	6.2	6.2	5802	5535	5535
Commercial / Institutional	2	1.9	1.9	1785	1696	1696
Industrial	2	1.9	1.9	1785	1696	1696
Landscape Irrigatior	3	2.9	2.9	2678	2589	2589
South East Growth Are	3.4	3.2	3.2	3035	2857	2857

Proposed Condition:

1) Proposed building square footage for underutilized parcels as provided by Moule & Polyzoides program received 1/19/11. Values calculated for the range of possible Floor Area Ratios (FAR).
2) Proposed Average Daily Flow rates per district were calculated as weighted averages based on M&P's distribution of land uses within each district. Flowrates per land use type were taken from the City of Oakland Sanitary Sewer Design Guidelines to reflect the dense, urban condition of the downtown area. Flows were then multipled by a factor of 1.2 to represent domestic water flows.
3) For parcels without a zone designation (i.e. '0'), FAR (High) and corresponding Weighted Average Daily Flow were calculated as an average of the
4) Proposed Average Daily Flow is only calculated for underutilized parcels. All other parcels are assumed not to change.

	Average Daily Flow (gpd/1000 sf)	CBD 1	CBD 2	Civic Center	Chinatown District	Cultural Arts/ South Stadium District	Chinatown Industrial District	Town Center	Neighborhood General	Neighborhood General Preservation	Special District	0
FAR (High)	--	6.090	2.386	0.000	1.413	1.987	1.505	0.000	0.706	0.735	1.072	1.590
Residential	200	45%	65%	0%	65%	60%	0%	0%	100%	100%	5%	44%
Office	240	40%	25%	75%	20%	20%	25%	75%	0%	0%	5%	29%
Retail	120	15%	10%	25%	15%	20%	0%	25%	0%	0%	0%	11%
Industrial	120	0%	0%	0%	0%	0%	75%	0%	0%	0%	90%	17%
Weighted Average Daily Flow (gpd/1000sf)		204	202	210	196	192	150	210	200	200	130	189

EXISTING UNDERUTILIZED PARCEL SUB-TOTALS	EXISTING		MIN PROPOSED FAR		MED PROPOSED FAR		MAX PROPOSED FAR	
	TOTAL BUILDING AREA (SF)	AVERAGE DAILY FLOW (gpd)	TOTAL BUILDING AREA (SF)	AVERAGE DAILY FLOW (gpd)	TOTAL BUILDING AREA (SF)	AVERAGE DAILY FLOW (gpd)	TOTAL BUILDING AREA (SF)	AVERAGE DAILY FLOW (gpd)
	--	170,822	5,240,428	1,041,656	9,572,280	1,904,565	14,123,642	2,808,32-
INCREASE FROM EXISTING (gpd)		--		870,835		1,733,744		2,637,503
PROJECT TOTALS (gpd)		683,983		1,554,818		2,417,727		3,321,486

PARCEL INFO				EXISTING			MIN PROPOSED FAR		MED PROPOSED FAR		MAX PROPOSED FAR	
AREA (sf)	ZONE	AREA (ac)	APN	BUILDING CONDITION	LAND USE (COF)	AVERAGE DAILY FLOW (gpd)	TOTAL BUILDING AREA (SF)	AVERAGE DAILY FLOW (gpd)	TOTAL BUILDING AREA (SF)	AVERAGE DAILY FLOW (gpd)	TOTAL BUILDING AREA (SF)	AVERAGE DAILY FLOW (gpd)
34,259	Cultural Arts/ South Stadium Distric	0.79	46502002	VACANT	v	0	0	0	0	0	0	0
8,955	Cultural Arts/ South Stadium District	0.21	46502001	U	il	349	6,767	1,299	12,282	2,358	17,797	3,417
20,514	Cultural Arts/ South Stadium Distric	0.47	46613117	U	co	799	15,502	2,976	28,136	5,402	40,769	7,828
12,679	Cultural Arts/ South Stadium Distric	0.29	46610332	VACANT	v	0	9,581	1,840	17,390	3,339	25,198	4,838
100,753	Cultural Arts/ South Stadium Distric	2.31	46618245	0	v	0	0	0	0	0	0	0
5,904	Cultural Arts/ South Stadium Distric	0.14	46610321	0	rm	423	0	0	0	0	0	0
26,089	Cultural Arts/ South Stadium Distric	0.60	46610331	0	co	1,016	0	0	0	0	0	0
18,226	Cultural Arts/ South Stadium Distric	0.42	46610326	0	pqch	710	0	0	0	0	0	0
17,599	Cultural Arts/ South Stadium Distric	0.40	46613344	0	cgh	685	0	0	0	0	0	0
350,138	Proposed Open Space	8.04	46502008U	VACANT	v	0	0	0	0	0	0	0
15,830	Cultural Arts/ South Stadium Distric	0.36	46618229	E	cgh	616	0	0	0	0	0	0
6,130	Cultural Arts/ South Stadium Distric	0.14	46613343	0	co	239	0	0	0	0	0	0
10,733	Cultural Arts/ South Stadium Distric	0.25	46613333	EU	cgh	418	8,110	1,557	14,720	2,826	21,329	4,095
12,714	Cultural Arts/ South Stadium Distric	0.29	46613327	0	rh	1,615	0	0	0	0	0	0
9,941	Cultural Arts/ South Stadium Distric	0.23	46610122	E	rh	1,263	0	0	0	0	0	0
13,271	Cultural Arts/ South Stadium Distric	0.30	46613328	VACANT	v	0	10,029	1,926	18,202	3,495	26,375	5,064
4,385	Cultural Arts/ South Stadium Distric	0.10	46613118	VACANT	v	0	3,313	636	6,013	1,155	8,714	1,673
5,846	Cultural Arts/ South Stadium Distric	0.13	46613119	VACANT	v	0	4,417	848	8,017	1,539	11,617	2,231
10,229	Cultural Arts/ South Stadium Distric	0.23	46613123	U	co	398	7,730	1,484	14,030	2,694	20,330	3,903
14,730	Cultural Arts/ South Stadium Distric	0.34	46613124	VACANT	v	0	11,131	2,137	20,202	3,879	29,274	5,621
3,926	Cultural Arts/ South Stadium Distric	0.09	46618101T	0	orp	233	0	0	0	0	0	0
25,985	Cultural Arts/ South Stadium Distric	0.60	46618320	U	cgh	1,012	19,635	3,770	35,637	6,842	51,638	9,914
19,841	Cultural Arts/ South Stadium Distric	0.46	46618315	U	cgh	773	14,993	2,879	27,212	5,225	39,431	7,571
11,992	Neighborhood General Preservatio	0.28	46610312	0	co	467	0	0	0	0	0	0
14,746	Cultural Arts/ South Stadium Distric	0.34	46618316	0	il	574	0	0	0	0	0	0
18,674	Cultural Arts/ South Stadium Distric	0.43	46618325	U	il	727	14,111	2,709	25,612	4,917	37,112	7,125
9,962	Cultural Arts/ South Stadium Distric	0.23	46613336	0	pqch	388	0	0	0	0	0	0
2,111	Cultural Arts/ South Stadium Distric	0.05	46613108	0	co	82	0	0	0	0	0	0
5,953	Cultural Arts/ South Stadium Distric	0.14	46613107	E	cgh	232	0	0	0	0	0	0
2,917	Cultural Arts/ South Stadium Distric	0.07	46613104	0	pqch	114	0	0	0	0	0	0
6,502	Cultural Arts/ South Stadium Distric	0.15	46613116	0	co	253	0	0	0	0	0	0
3,411	Cultural Arts/ South Stadium Distric	0.08	46613303	0	v	0	0	0	0	0	0	0
13,568	Cultural Arts/ South Stadium Distric	0.31	46618240	EU	cgh	528	10,253	1,969	18,608	3,573	26,964	5,177
59,532	Neighborhood Genera	1.37	46610106	0	cgh	2,318	0	0	0	0	0	0

SHERWOOD Design Engineers

PARCEL INFO				EXISTING			MIN PROPOSED FAR		MED PROPOSED FAR		MAX PROPOSED FAR	
AREA (sf)	ZONE	AREA (ac)	APN	BUILDING CONDITION	LAND USE (COF)	AVERAGE DAILY FLOW (gpd)	TOTAL BUILDING AREA (SF)	AVERAGE DAILY FLOW (gpd)	TOTAL BUILDING AREA (SF)	AVERAGE DAILY FLOW (gpd)	TOTAL BUILDING AREA (SF)	AVERAGE DAILY FLOW (gpd)
9,878	Neighborhood General Preservatio	0.23	46610304	EU	rmh	1,255	3,928	786	5,594	1,119	7,260	1,452
2,498	Cultural Arts/ South Stadium Distric	0.06	46613105	E	pqch	97	0	0	0	0	0	0
9,713	Cultural Arts/ South Stadium Distric	0.22	46613304	0	cgh	378	0	0	0	0	0	0
28,935	Neighborhood General Preservatio	0.66	46610325	U	co	1,127	11,505	2,301	16,385	3,277	21,266	4,253
6,216	Neighborhood General Preservatio	0.14	46610303	E	rml	446	0	0	0	0	0	0
5,981	Neighborhood General Preservatio	0.14	46610302	0	rml	429	0	0	0	0	0	0
55,600	Cultural Arts/ South Stadium Distric	1.28	46613335	0	rh	7,064	0	0	0	0	0	0
19,347	Cultural Arts/ South Stadium Distric	0.44	46618325	U	il	753	14,620	2,807	26,535	5,095	38,449	7,382
4,978	Neighborhood General Preservatio	0.11	46610310	VACANT	v	0	1,979	396	2,819	564	3,658	732
15,016	Cultural Arts/ South Stadium Distric	0.34	46618235	0	cgh	585	0	0	0	0	0	0
11,238	Neighborhood General Preservatio	0.26	46613201	E	pqhc	438	0	0	0	0	0	0
9,991	Cultural Arts/ South Stadium Distric	0.23	46613106	0	co	385	0	0	0	0	0	0
9,026	Cultural Arts/ South Stadium Distric	0.21	46613338	0	co	351	6,821	1,310	12,379	2,377	17,938	3,444
4,983	Neighborhood General Preservatio	0.11	46610309	VACANT	v	0	0	0	0	0	0	0
9,084	Cultural Arts/ South Stadium Distric	0.21	46613305	E	cgh	354	0	0	0	0	0	0
26,894	Cultural Arts/ South Stadium Distric	0.62	46618415	0	il	1,047	0	0	0	0	0	0
3,747	Cultural Arts/ South Stadium Distric	0.09	46618307	U	il	146	2,832	544	5,140	987	7,448	1,430
7,489	Neighborhood General Preservatio	0.17	46613202	VACANT	v	0	2,978	596	4,241	848	5,504	1,101
7,570	Cultural Arts/ South Stadium Distric	0.17	46613306	0	cgh	295	0	0	0	0	0	0
7,493	Neighborhood General Preservatio	0.17	46613203	0	rh	952	0	0	0	0	0	0
59,935	Neighborhood Genera	1.38	46610417	0	pqhc	2,334	0	0	0	0	0	0
11,269	Cultural Arts/ South Stadium Distric	0.26	46613213	VACANT	v	0	8,516	1,635	15,456	2,967	22,395	4,300
15,199	Cultural Arts/ South Stadium Distric	0.35	46613324	U	co	592	11,486	2,205	20,846	4,002	30,206	5,800
14,996	Neighborhood General Preservatio	0.34	46613204	0	rh	1,905	0	0	0	0	0	0
22,449	Cultural Arts/ South Stadium Distric	0.52	46619112	0	cgh	874	0	0	0	0	0	0
3,754	Cultural Arts/ South Stadium Distric	0.09	46613212	0	cgh	146	0	0	0	0	0	0
14,982	Cultural Arts/ South Stadium Distric	0.34	46618410	0	il	583	0	0	0	0	0	0
7,508	Cultural Arts/ South Stadium Distric	0.17	46613211	U	cgh	292	5,674	1,089	10,298	1,977	14,922	2,865
10,664	Cultural Arts/ South Stadium Distric	0.24	46618414	EU	il	415	8,059	1,547	14,626	2,808	21,194	4,069
15,074	Neighborhood General Preservatio	0.35	46610415	0	co	587	0	0	0	0	0	0
11,256	Neighborhood General Preservatio	0.26	46613205	E	rmh	1,430	0	0	0	0	0	0
11,265	Cultural Arts/ South Stadium Distric	0.26	46613210	U	cgh	439	8,512	1,634	15,450	2,966	22,387	4,298
8,342	Cultural Arts/ South Stadium Distric	0.19	46618405	E	il	325	0	0	0	0	0	0
26,218	Cultural Arts/ South Stadium Distric	0.60	46618412	0	il	1,021	0	0	0	0	0	0
7,501	Cultural Arts/ South Stadium Distric	0.17	46613401	0	cgh	292	0	0	0	0	0	0
6,725	Neighborhood General Preservatio	0.15	46613206	0	co	262	0	0	0	0	0	0
10,479	Cultural Arts/ South Stadium Distric	0.24	46619111	VACANT	v	0	7,919	1,520	14,372	2,759	20,826	3,999
7,480	Cultural Arts/ South Stadium Distric	0.17	46619103	U	cgh	291	5,653	1,085	0	0	14,866	2,854
18,780	Cultural Arts/ South Stadium Distric	0.43	46613214	0	cgh	731	0	0	0	0	0	0
22,578	Neighborhood General Preservatio	0.52	46610409	0	co	879	0	0	0	0	0	0
14,781	Cultural Arts/ South Stadium Distric	0.34	46618413	VACANT	il	576	11,170	2,145	20,273	3,892	29,375	5,640
5,621	Cultural Arts/ South Stadium Distric	0.13	46613402	0	cgh	219	0	0	0	0	0	0
22,359	Proposed Open Space	0.51	46502009U	0	il	871	0	0	0	0	0	0
44,483	Neighborhood Genera	1.02	46610215	0	pqch	1,732	0	0	0	0	0	0
7,479	Cultural Arts/ South Stadium Distric	0.17	46619118	U	cgh	291	5,652	1,085	10,258	1,970	14,864	2,854
5,621	Cultural Arts/ South Stadium Distric	0.13	46613403	EU	cgh	219	4,247	816	7,709	1,480	11,170	2,145
13,961	Cultural Arts/ South Stadium Distric	0.32	46619110	0	cgh	544	0	0	0	0	0	0
7,479	Cultural Arts/ South Stadium Distric	0.17	46619118	U	cgh	291	5,651	1,085	10,257	1,969	14,863	2,854
7,494	Cultural Arts/ South Stadium Distric	0.17	46613404	E	cgh	292	0	0	0	0	0	0
7,736	Neighborhood General Preservatio	0.18	46614101	0	co	301	0	0	0	0	0	0
7,512	Cultural Arts/ South Stadium Distric	0.17	46613418	VACANT	v	0	5,677	1,090	10,303	1,978	14,930	2,866
6,783	Cultural Arts/ South Stadium Distric	0.16	46613207	U	co	264	5,125	984	9,302	1,786	13,479	2,588
18,437	Cultural Arts/ South Stadium Distric	0.42	46618416	U	il	718	13,933	2,675	25,287	4,855	36,642	7,035
14,858	Cultural Arts/ South Stadium Distric	0.34	46619119	U	cgh	291	11,228	2,156	20,378	3,913	29,528	5,669
11,241	Cultural Arts/ South Stadium Distric	0.26	46613405	U	cgh	438	8,494	1,631	15,417	2,960	22,339	4,289
11,275	Neighborhood General Preservatio	0.26	46610417	U	pqhc	2,334	4,483	897	6,385	1,277	8,286	1,657
45,045	Neighborhood General Preservatio	1.03	46614108	0	co	1,754	0	0	0	0	0	0
13,950	Cultural Arts/ South Stadium Distric	0.32	46619109	0	cgh	543	0	0	0	0	0	0
22,507	Cultural Arts/ South Stadium Distric	0.52	46613417	U	cgh	876	17,008	3,266	30,869	5,927	44,730	8,588
22,485	Cultural Arts/ South Stadium Distric	0.52	46619401	0	cghv	875	0	0	0	0	0	0
11,783	Proposed Open Space	0.27	46502010U	0	il	459	0	0	0	0	0	0
10,491	Cultural Arts/ South Stadium Distric	0.24	46613406	0	cgh	408	0	0	0	0	0	0
22,463	Cultural Arts/ South Stadium Distric	0.52	46614110	0	pf	875	0	0	0	0	0	0
11,172	Neighborhood General Preservatio	0.26	46610407	0	pqhc	435	0	0	0	0	0	0
24,024	Neighborhood Genera	0.55	46610524	U	cp	0	7,124	1,425	12,038	2,408	16,952	3,390
17,386	Cultural Arts/ South Stadium Distric	0.40	46619108	U	cgh	677	13,139	2,523	23,846	4,578	34,553	6,634
12,030	Cultural Arts/ South Stadium Distric	0.28	46613407	0	co	468	0	0	0	0	0	0
7,200	Cultural Arts/ South Stadium Distric	0.17	46613411	U	cp	0	5,441	1,045	9,874	1,896	14,308	2,747
22,457	Cultural Arts/ South Stadium Distric	0.52	46619201	E	cgh	874	0	0	0	0	0	0
6,494	Cultural Arts/ South Stadium Distric	0.15	46614111	0	pf	253	0	0	0	0	0	0
7,497	Cultural Arts/ South Stadium Distric	0.17	46619410	VACANT	v	0	5,666	1,088	10,283	1,974	14,900	2,861
7,491	Cultural Arts/ South Stadium Distric	0.17	46619402	0	cgh	292	0	0	0	0	0	0
14,747	Neighborhood Genera	0.34	46610208	E	cgh	574	0	0	0	0	0	0
11,546	Cultural Arts/ South Stadium Distric	0.27	46613410	0	cgh	450	0	0	0	0	0	0
46,363	Cultural Arts/ South Stadium Distric	1.06	46614104	0	co	1,805	0	0	0	0	0	0

SHERWOOD Design Engineers

PARCEL INFO				EXISTING			MIN PROPOSED FAR		MED PROPOSED FAR		MAX PROPOSED FAR	
AREA (sf)	ZONE	AREA (ac)	APN	BUILDING CONDITION	LAND USE (COF)	AVERAGE DAILY FLOW (gpd)	TOTAL BUILDING AREA (SF)	AVERAGE DAILY FLOW (gpd)	TOTAL BUILDING AREA (SF)	AVERAGE DAILY FLOW (gpd)	TOTAL BUILDING AREA (SF)	AVERAGE DAILY FLOW (gpd)
8,020	Neighborhood Genera	0.18	46610523	U	rmh	1,019	2,378	476	4,019	804	5,659	1,132
7,492	Cultural Arts/ South Stadium Distric	0.17	46619409	VACANT	v	0	5,662	1,087	10,275	1,973	14,889	2,859
39,959	Neighborhood Genera	0.92	46610525	U	cp	0	0	0	0	0	0	0
29,992	Cultural Arts/ South Stadium Distric	0.69	46619419	0	cgh	1,168	0	0	0	0	0	0
7,998	Neighborhood Genera	0.18	46610522	U	rmh	1,016	2,371	474	4,007	801	5,643	1,129
29,980	Cultural Arts/ South Stadium Distric	0.69	46619418	0	cgh	1,167	0	0	0	0	0	0
3,755	Cultural Arts/ South Stadium Distric	0.09	46613408	E	co	146	0	0	0	0	0	0
33,717	Cultural Arts/ South Stadium Distric	0.77	46614408	0	co	1,313	0	0	0	0	0	0
11,880	Cultural Arts/ South Stadium Distric	0.27	46619210	EU	cp	0	8,978	1,724	16,294	3,128	23,610	4,533
26,211	Cultural Arts/ South Stadium Distric	0.60	46619216	VACANT	cgh	1,021	19,807	3,803	35,949	6,902	52,090	10,001
11,993	Neighborhood Genera	0.28	46610521	0	rmh	1,524	0	0	0	0	0	0
7,511	Cultural Arts/ South Stadium Distric	0.17	46613409	U	co	292	5,676	1,090	10,301	1,978	14,926	2,866
210,125	Proposed Open Space	4.82	46503013U	0	ilv	8,182	0	0	0	0	0	0
19,917	Neighborhood Genera	0.46	46611124	0	cgh	775	0	0	0	0	0	0
35,826	Neighborhood Genera	0.82	46610520	U	cp	0	10,623	2,125	17,951	3,590	25,280	5,056
12,581	Cultural Arts/ South Stadium Distric	0.29	46619211	U	cp	0	9,507	1,825	17,254	3,313	25,002	4,800
7,506	Neighborhood Genera	0.17	46614201	U	co	292	2,226	445	3,761	752	5,297	1,059
37,462	Cultural Arts/ South Stadium Distric	0.86	46614407	U	cgh	1,459	28,310	5,435	51,380	9,869	74,451	14,295
43,860	Neighborhood Genera	1.01	46611125	0	cp	0	0	0	0	0	0	0
7,499	Neighborhood Genera	0.17	46614202	U	co	292	2,224	445	3,758	752	5,292	1,058
15,016	Cultural Arts/ South Stadium Distric	0.34	46619419	0	cgh	1,168	0	0	0	0	0	0
6,989	Cultural Arts/ South Stadium Distric	0.16	46619207	U	cp	0	5,281	1,014	9,585	1,840	13,889	2,667
11,244	Cultural Arts/ South Stadium Distric	0.26	46619203	E	cgh	438	0	0	0	0	0	0
29,820	Cultural Arts/ South Stadium Distric	0.68	46619501	0	il	1,161	0	0	0	0	0	0
26,189	Cultural Arts/ South Stadium Distric	0.60	46614403T	0	co	1,020	0	0	0	0	0	0
14,994	Neighborhood Genera	0.34	46614203	U	co	584	4,446	889	7,513	1,503	10,580	2,116
6,988	Cultural Arts/ South Stadium Distric	0.16	46619206	E	cp	0	0	0	0	0	0	0
15,040	Neighborhood Genera	0.35	46611401	U	cgh	586	4,460	892	7,536	1,507	10,613	2,123
26,234	Cultural Arts/ South Stadium Distric	0.60	46614212	0	cgh	1,021	0	0	0	0	0	0
10,482	Cultural Arts/ South Stadium Distric	0.24	46619205	U	cp	0	7,921	1,521	14,377	2,760	20,832	4,000
8,995	Neighborhood Genera	0.21	46614204	VACANT	rh	1,143	2,667	533	4,506	901	6,346	1,269
8,244	Cultural Arts/ South Stadium Distric	0.19	46619301	E	cgh	321	0	0	0	0	0	0
14,991	Cultural Arts/ South Stadium Distric	0.34	46619507	0	il	584	0	0	0	0	0	0
18,752	Neighborhood Genera	0.43	46611412	U	cgh	730	5,560	1,112	9,396	1,879	13,232	2,646
6,996	Cultural Arts/ South Stadium Distric	0.16	46619204	U	cp	0	5,287	1,015	9,595	1,842	13,904	2,670
9,739	Neighborhood Genera	0.22	46614214	VACANT	pqch	379	2,888	578	4,880	976	6,872	1,374
22,459	Cultural Arts/ South Stadium Distric	0.52	46614406	EU	cgh	874	16,971	3,259	30,802	5,914	44,633	8,570
17,971	Cultural Arts/ South Stadium Distric	0.41	46619302	E	cgh	700	0	0	0	0	0	0
14,970	Neighborhood Genera	0.34	46611411	U	cgh	583	4,439	888	7,501	1,500	10,563	2,113
18,685	Cultural Arts/ South Stadium Distric	0.43	46619502	0	il	728	0	0	0	0	0	0
14,979	Cultural Arts/ South Stadium Distric	0.34	46614208	0	cgh	583	0	0	0	0	0	0
11,171	Neighborhood Genera	0.26	46614215	VACANT	pqch	435	3,312	662	5,598	1,120	7,883	1,577
11,228	Cultural Arts/ South Stadium Distric	0.26	46619506	0	il	437	0	0	0	0	0	0
36,236	Cultural Arts/ South Stadium Distric	0.83	46614501T	0	cgh	1,411	0	0	0	0	0	0
26,181	Neighborhood Genera	0.60	46611415	U	cgh	1,019	7,763	1,553	13,118	2,624	18,474	3,695
18,748	Cultural Arts/ South Stadium Distric	0.43	46619320	U	cp	0	14,168	2,720	25,713	4,937	37,259	7,154
44,753	Neighborhood Genera	1.03	46611414	U	cgh	1,743	13,270	2,654	22,425	4,485	31,579	6,316
6,469	Cultural Arts/ South Stadium Distric	0.15	46619303	E	cgh	252	0	0	0	0	0	0
7,478	Cultural Arts/ South Stadium Distric	0.17	46619505	0	il	291	0	0	0	0	0	0
11,284	Cultural Arts/ South Stadium Distric	0.26	46619503	E	il	439	0	0	0	0	0	0
41,162	Neighborhood Genera	0.94	46611215T	0	co	1,603	0	0	0	0	0	0
7,487	Cultural Arts/ South Stadium Distric	0.17	46614208	0	cgh	292	0	0	0	0	0	0
4,762	Cultural Arts/ South Stadium Distric	0.11	46619304	E	cgh	185	0	0	0	0	0	0
26,103	Cultural Arts/ South Stadium Distric	0.60	46619504	U	il	1,016	19,726	3,787	35,801	6,874	51,877	9,960
11,978	Cultural Arts/ South Stadium Distric	0.27	46619308	0	cgh	466	0	0	0	0	0	0
11,206	Cultural Arts/ South Stadium Distric	0.26	46614207	0	cgh	436	0	0	0	0	0	0
18,726	Neighborhood Genera	0.43	46614301	0	pqch	729	0	0	0	0	0	0
14,976	Cultural Arts/ South Stadium Distric	0.34	46614508T	VACANT	cgh	583	11,317	2,173	20,540	3,944	29,763	5,714
12,694	Cultural Arts/ South Stadium Distric	0.29	46619310	0	cgh	494	0	0	0	0	0	0
240,428	Proposed Open Space	5.52	46503012U	0	ilv	9,362	0	0	0	0	0	0
10,476	Cultural Arts/ South Stadium Distric	0.24	46619309	E	cgh	408	0	0	0	0	0	0
14,959	Cultural Arts/ South Stadium Distric	0.34	46619601	EU	il	582	11,304	2,170	20,517	3,939	29,729	5,708
24,440	Cultural Arts/ South Stadium Distric	0.56	46619306	U	cgh	952	18,469	3,546	33,519	6,436	48,570	9,325
13,171	Cultural Arts/ South Stadium Distric	0.30	46614502T	VACANT	co	513	9,953	1,911	18,064	3,468	26,175	5,026
7,484	Cultural Arts/ South Stadium Distric	0.17	46614507T	E	cgh	291	0	0	0	0	0	0
7,494	Neighborhood Genera	0.17	46614302	U	co	292	2,222	444	3,755	751	5,288	1,058
11,225	Neighborhood Genera	0.26	46611501	EU	cgh	437	3,328	666	5,624	1,125	7,920	1,584
10,292	CBD 1	0.24	46614313	0	co	401	0	0	0	0	0	0
3,741	Cultural Arts/ South Stadium Distric	0.09	46614506T	EU	cgh	146	0	0	0	0	0	0
7,496	Neighborhood Genera	0.17	46614303	0	co	292	0	0	0	0	0	0
14,969	Cultural Arts/ South Stadium Distric	0.34	46619602	VACANT	v	0	11,312	2,172	20,530	3,942	29,748	5,712
14,960	Cultural Arts/ South Stadium Distric	0.34	46614505T	EU	cgh	583	11,305	2,171	20,518	3,940	29,731	5,708
10,487	Cultural Arts/ South Stadium Distric	0.24	46614503T	VACANT	co	408	7,924	1,521	14,382	2,761	20,841	4,001
11,227	Neighborhood Genera	0.26	46611502	0	rml	805	0	0	0	0	0	0
7,508	Neighborhood Genera	0.17	46611207	U	co	292	2,226	445	3,762	752	5,298	1,060

SHERWOOD Design Engineers

PARCEL INFO				EXISTING			MIN PROPOSED FAR		MED PROPOSED FAR		MAX PROPOSED FAR	
AREA (sf)	ZONE	AREA (ac)	APN	BUILDING CONDITION	LAND USE (COF)	AVERAGE DAILY FLOW (gpd)	TOTAL BUILDING AREA (SF)	AVERAGE DAILY FLOW (gpd)	TOTAL BUILDING AREA (SF)	AVERAGE DAILY FLOW (gpd)	TOTAL BUILDING AREA (SF)	AVERAGE DAILY FLOW (gpd)
22,473	Cultural Arts/ South Stadium Distric	0.52	46620115	0	cgh	875	0	0	0	0	0	0
49,669	CBD 1	1.14	46614315	U	co	1,934	85,099	17,360	193,797	39,535	302,495	61,709
26,299	Neighborhood Genera	0.60	46614314	0	co	1,024	0	0	0	0	0	0
54,918	Cultural Arts/ South Stadium Distric	1.26	46619604	0	il	2,138	0	0	0	0	0	0
11,261	Neighborhood Genera	0.26	46611206	U	co	438	3,339	668	5,643	1,129	7,946	1,589
7,465	Neighborhood Genera	0.17	46611512	U	co	291	2,213	443	3,741	748	5,268	1,054
14,975	Neighborhood Genera	0.34	46611503	0	rh	1,903	0	0	0	0	0	0
29,924	Cultural Arts/ South Stadium Distric	0.69	46619603	0	il	1,165	0	0	0	0	0	0
18,710	Cultural Arts/ South Stadium Distric	0.43	46614504	EU	cgh	728	14,139	2,715	25,661	4,927	37,183	7,139
52,105	Proposed Open Space	1.20	46503021U	0	il	2,029	0	0	0	0	0	0
7,468	Neighborhood Genera	0.17	46611511	U	co	291	2,214	443	3,742	748	5,269	1,054
37,408	CBD 1	0.86	46614615U	0	cgh	1,457	0	0	0	0	0	0
20,940	Cultural Arts/ South Stadium Distric	0.48	46620114	U	cp	0	15,824	3,038	28,719	5,514	41,615	7,990
25,933	Cultural Arts/ South Stadium Distric	0.60	46620116	0	cgh	1,010	0	0	0	0	0	0
11,208	Neighborhood Genera	0.26	46611510	U	co	436	3,323	665	5,616	1,123	7,909	1,582
22,570	Neighborhood Genera	0.52	46611513T	0	co	879	0	0	0	0	0	0
22,441	CBD 2	0.52	46611307	U	co	874	25,762	5,204	39,653	8,010	53,544	10,816
14,956	Neighborhood Genera	0.34	46611508	0	co	582	0	0	0	0	0	0
29,985	Neighborhood Genera	0.69	46615114	U	cgh	1,167	8,890	1,778	15,024	3,005	21,157	4,231
18,688	CBD 1	0.43	46614614	U	cgh	728	32,018	6,532	72,916	14,875	113,814	23,218
6,984	Cultural Arts/ South Stadium Distric	0.16	46620108	U	cp	0	5,278	1,013	9,579	1,839	13,880	2,665
4,985	Cultural Arts/ South Stadium Distric	0.11	46619605	0	il	194	0	0	0	0	0	0
11,651	Cultural Arts/ South Stadium Distric	0.27	46620104	0	cgh	454	0	0	0	0	0	0
18,813	Neighborhood Genera	0.43	46611515	U	cp	0	5,578	1,116	9,427	1,885	13,275	2,655
6,986	Cultural Arts/ South Stadium Distric	0.16	46620107	U	cgh	272	5,279	1,014	9,585	1,840	13,884	2,666
12,000	CBD 2	0.28	46611306	U	cgh	467	13,776	2,783	21,203	4,283	28,631	5,783
29,977	Cultural Arts/ South Stadium Distric	0.69	46620410	U	il	1,167	22,653	4,349	41,114	7,894	59,575	11,438
22,518	CBD 1	0.52	46614613	U	cgh	877	38,581	7,871	87,861	17,924	137,141	27,977
8,495	CBD 2	0.19	46611614T	0	pqp	331	0	0	0	0	0	0
59,867	CBD 2	1.37	46611613T	0	pqp	2,331	0	0	0	0	0	0
21,026	Cultural Arts/ South Stadium Distric	0.48	46620112	U	cgh	819	15,889	3,051	28,837	5,537	41,786	8,023
7,477	CBD 1	0.17	46614609	0	pqch	291	0	0	0	0	0	0
10,785	CBD 1	0.25	46615114	0	cgh	1,167	0	0	0	0	0	0
25,563	CBD 2	0.59	46611308	VACANT	v	0	29,346	5,928	45,169	9,124	60,992	12,320
33,730	CBD 1	0.77	46614616	0	cgh	1,313	0	0	0	0	0	0
7,491	Neighborhood Genera	0.17	46615103	U	cgh	292	2,221	444	3,753	751	5,286	1,057
20,625	CBD 1	0.47	46620201	0	cgh	803	0	0	0	0	0	0
7,937	CBD 1	0.18	46615110	E	cgh	309	0	0	0	0	0	0
37,479	Cultural Arts/ South Stadium Distric	0.86	46620407	0	il	1,459	0	0	0	0	0	0
7,489	Neighborhood Genera	0.17	46615104	U	cgh	292	2,221	444	3,753	751	5,284	1,057
7,487	CBD 1	0.17	46615109	0	cgh	292	0	0	0	0	0	0
59,815	CBD 2	1.37	46611613T	U	pqp	2,331	68,668	13,871	105,693	21,350	142,718	28,829
29,510	Cultural Arts/ South Stadium Distric	0.68	46620409	U	il	1,149	22,300	4,282	40,474	7,771	58,647	11,260
127,656	Civic Center	2.93	46612101T	0	pgo	4,971	0	0	0	0	0	0
15,064	Neighborhood Genera	0.35	46615105	U	co	587	4,467	893	7,548	1,510	10,630	2,126
7,486	CBD 1	0.17	46615108	0	cgh	291	0	0	0	0	0	0
7,495	CBD 1	0.17	46620202	0	pqch	292	0	0	0	0	0	0
13,976	CBD 1	0.32	46620220	E	cgh	544	0	0	0	0	0	0
6,737	CBD 1	0.15	46615107	0	cgh	262	0	0	0	0	0	0
255,106	0	5.86	46504034U	0	ilv	9,933	0	0	0	0	0	0
20,595	CBD 1	0.47	46620221	0	cp	0	0	0	0	0	0	0
19,541	CBD 1	0.45	46615106	0	cgh	761	0	0	0	0	0	0
10,474	CBD 1	0.24	46620219	E	cgh	408	0	0	0	0	0	0
11,225	CBD 2	0.26	46615201	0	co	437	0	0	0	0	0	0
14,953	Cultural Arts/ South Stadium Distric	0.34	46620406	0	il	582	0	0	0	0	0	0
22,912	CBD 1	0.53	46615315	0	cp	0	0	0	0	0	0	0
27,921	CBD 1	0.64	46615318	0	cp	0	0	0	0	0	0	0
10,467	CBD 1	0.24	46620208	U	cp	0	17,934	3,659	40,841	8,332	63,748	13,005
11,269	CBD 1	0.26	46620205	E1	co	439	0	0	0	0	0	0
28,486	CBD 2	0.65	46615202	U	co	1,109	32,702	6,606	50,335	10,168	67,968	13,730
11,222	CBD 1	0.26	46620523	VACANT	il	437	19,228	3,922	43,788	8,933	68,347	13,943
7,437	Cultural Arts/ South Stadium Distric	0.17	46620405	0	il	290	0	0	0	0	0	0
10,460	CBD 1	0.24	46620207	0	cgh	407	0	0	0	0	0	0
17,854	CBD 1	0.41	46615312	U	co	695	30,590	6,240	69,662	14,211	108,735	22,182
26,172	CBD 1	0.60	46615211	0	co	1,019	0	0	0	0	0	0
607,022	Civic Center	13.94	46616001T	0	phce	23,636	0	0	0	0	0	0
7,488	CBD 1	0.17	46620524	VACANT	il	292	12,829	2,617	29,216	5,960	45,602	9,303
60,644	CBD 1	1.39	46620656T	U	co	2,361	103,904	21,196	236,622	48,271	369,340	75,345
10,468	CBD 1	0.24	46620206	U	cp	0	17,935	3,659	40,843	8,332	63,752	13,005
14,977	CBD 1	0.34	46620503	VACANT	il	583	25,661	5,235	58,435	11,922	91,217	18,608
85,119	District	1.95	46504023S	0	il	3,314	0	0	0	0	0	0
10,821	CBD 1	0.25	46620514	0	il	421	0	0	0	0	0	0
23,915	CBD 1	0.55	46615314	U	cgh	931	40,974	8,359	93,311	19,035	145,647	29,712
20,179	CBD 2	0.46	46615203	0	co	786	0	0	0	0	0	0
26,224	Civic Center	0.60	46612201T	0	pgo	1,021	0	0	0	0	0	0

SHERWOOD Design Engineers

PARCEL INFO				EXISTING			MIN PROPOSED FAR		MED PROPOSED FAR		MAX PROPOSED FAR	
AREA (sf)	ZONE	AREA (ac)	APN	BUILDING CONDITION	LAND USE (COF)	AVERAGE DAILY FLOW (gpd)	TOTAL BUILDING AREA (SF)	AVERAGE DAILY FLOW (gpd)	TOTAL BUILDING AREA (SF)	AVERAGE DAILY FLOW (gpd)	TOTAL BUILDING AREA (SF)	AVERAGE DAILY FLOW (gpd)
7,473	CBD 1	0.17	46620513	0	il	291	0	0	0	0	0	0
7,490	CBD 1	0.17	46620504	VACANT	il	292	12,832	2,618	29,223	5,961	45,614	9,305
33,659	CBD 1	0.77	46615210	0	co	1,311	0	0	0	0	0	0
35,180	CBD 1	0.81	46615419T	0	cgh	1,370	0	0	0	0	0	0
19,852	CBD 1	0.46	46620512	0	il	773	0	0	0	0	0	0
7,490	CBD 1	0.17	46620505	E	rh	952	0	0	0	0	0	0
57,293	CBD 1	1.32	46620650T	0	cp	0	0	0	0	0	0	0
11,241	CBD 1	0.26	46620506	U	cp	0	19,260	3,925	43,862	8,948	68,463	13,966
2,579	CBD 1	0.06	46620651T	0	v	0	0	0	0	0	0	0
24,456	Civic Center	0.56	46612203	0	pgo	952	0	0	0	0	0	0
66,752	Civic Center	1.53	46612202T	0	pgo	2,595	0	0	0	0	0	0
8,178	CBD 1	0.19	46620511	0	cgh	318	0	0	0	0	0	0
4,391	CBD 1	0.10	46620637	0	cgh	171	0	0	0	0	0	0
11,191	CBD 1	0.26	46615414	0	co	436	0	0	0	0	0	0
58,732	CBD 1	1.35	46620648	0	cgh	2,287	0	0	0	0	0	0
12,679	CBD 1	0.29	46620518	0	il	494	0	0	0	0	0	0
25,483	Special District	0.59	46504006	U	il	992	10,924	1,420	19,124	2,486	27,323	3,552
7,451	CBD 1	0.17	46615413	0	cgh	290	0	0	0	0	0	0
11,602	CBD 1	0.27	46620638	0	cgh	452	0	0	0	0	0	0
21,854	CBD 1	0.50	46615421	0	co	851	0	0	0	0	0	0
18,582	CBD 1	0.43	46615412	0	cgh	724	0	0	0	0	0	0
46,094	Special District	1.06	46508426	0	il	1,795	0	0	0	0	0	0
8,135	0	0.19	46504031S	0	il	317	0	0	0	0	0	0
25,379	CBD 1	0.58	46620647	0	cgh	988	0	0	0	0	0	0
18,327	CBD 1	0.42	46621112	0	pgo	714	0	0	0	0	0	0
30,028	CBD 1	0.69	46620649	0	cp	0	0	0	0	0	0	0
47,087	0	1.08	46504035U	0	il	1,833	0	0	0	0	0	0
11,971	0	0.27	46504005T	0	il	466	0	0	0	0	0	0
11,462	CBD 1	0.26	46615431	0	co	446	0	0	0	0	0	0
173,378	Special District	3.98	46508425	0	il	6,751	0	0	0	0	0	0
57,263	0	1.31	46504036U	0	il	2,230	0	0	0	0	0	0
5,278	CBD 1	0.12	46621120	0	pgo	205	0	0	0	0	0	0
33,734	CBD 2	0.77	46504004	0	il	1,313	0	0	0	0	0	0
10,737	CBD 1	0.25	46615411	0	co	418	0	0	0	0	0	0
20,969	CBD 1	0.48	46621113T	0	cp	0	0	0	0	0	0	0
1,406	CBD 1	0.03	46625007U	0	co	55	0	0	0	0	0	0
14,754	CBD 1	0.34	46621103T	0	pgo	574	0	0	0	0	0	0
31,428	CBD 1	0.72	46625008T	0	co	1,224	0	0	0	0	0	0
29,716	CBD 1	0.68	46620654T	U	cp	0	50,914	10,386	115,947	23,653	180,980	36,920
40,825	CBD 2	0.94	46821116	0	co	1,590	0	0	0	0	0	0
2,081	CBD 1	0.05	46621119T	0	pgo	81	0	0	0	0	0	0
11,112	CBD 1	0.26	46621104T	0	pgo	433	0	0	0	0	0	0
16,735	CBD 1	0.38	46626001	0	cr	652	0	0	0	0	0	0
5,775	CBD 1	0.13	46621115T	0	cp	0	0	0	0	0	0	0
22,478	CBD 1	0.52	46621401	E	cgh	875	0	0	0	0	0	0
3,258	CBD 1	0.07	46621105	0	cgh	127	0	0	0	0	0	0
26,201	CBD 2	0.60	46504003	0	il	1,020	0	0	0	0	0	0
29,325	CBD 1	0.67	46621117	0	rh	3,726	0	0	0	0	0	0
18,952	CBD 2	0.44	46509120	U	il	738	21,757	4,395	33,488	6,765	45,219	9,134
4,287	CBD 1	0.10	46621106	0	cgh	167	0	0	0	0	0	0
13,367	CBD 1	0.31	46617114	0	cr	520	0	0	0	0	0	0
127,021	CBD 2	2.92	46821410T	0	pgo	4,946	0	0	0	0	0	0
18,701	CBD 1	0.43	46625008T	0	co	1,224	0	0	0	0	0	0
1,908	CBD 1	0.04	46620629T	0	v	0	0	0	0	0	0	0
25,305	CBD 2	0.58	46818520	U	cp	0	29,051	5,865	44,715	9,032	60,378	12,196
29,755	CBD 2	0.68	46509135	0	il	1,159	0	0	0	0	0	0
18,769	CBD 2	0.43	46509134	U	il	731	21,547	4,352	33,165	6,699	44,783	9,046
1,829	CBD 1	0.04	46620631T	0	v	0	0	0	0	0	0	0
18,758	CBD 2	0.43	46821115	0	co	730	0	0	0	0	0	0
6,008	CBD 1	0.14	46617113	0	cr	234	0	0	0	0	0	0
7,504	CBD 1	0.17	46621201	0	cr	292	0	0	0	0	0	0
3,387	CBD 1	0.08	46621417T	0	v	0	0	0	0	0	0	0
12,016	CBD 1	0.28	46617112	0	cr	468	0	0	0	0	0	0
96,009	CBD 2	2.20	46821219T	0	pcce	3,738	0	0	0	0	0	0
7,496	CBD 1	0.17	46621217	0	cr	292	0	0	0	0	0	0
55,688	CBD 1	1.28	46621417T	0	v	0	0	0	0	0	0	0
25,253	CBD 2	0.58	46818511	U	cp	0	28,991	5,856	44,622	9,014	60,254	12,171
7,495	CBD 1	0.17	46621216	0	cr	292	0	0	0	0	0	0
615	CBD 1	0.01	46621417T	0	v	0	0	0	0	0	0	0
17,251	CBD 2	0.40	46509133	U	il	672	19,804	4,000	30,482	6,157	41,160	8,314
21,963	CBD 2	0.50	46504022S	0	il	855	0	0	0	0	0	0
132,552	CBD 1	3.04	46703035ST	0	ilv	5,161	0	0	0	0	0	0
12,007	CBD 1	0.28	46617111	0	cr	468	0	0	0	0	0	0
537	CBD 1	0.01	46621118T	0	road	21	0	0	0	0	0	0
18,908	CBD 1	0.43	46624003	0	cgh	736	0	0	0	0	0	0

SHERWOOD Design Engineers

PARCEL INFO				EXISTING			MIN PROPOSED FAR		MED PROPOSED FAR		MAX PROPOSED FAR	
AREA (sf)	ZONE	AREA (ac)	APN	BUILDING CONDITION	LAND USE (COF)	AVERAGE DAILY FLOW (gpd)	TOTAL BUILDING AREA (SF)	AVERAGE DAILY FLOW (gpd)	TOTAL BUILDING AREA (SF)	AVERAGE DAILY FLOW (gpd)	TOTAL BUILDING AREA (SF)	AVERAGE DAILY FLOW (gpd)
14,022	CBD 1	0.32	46621212	0	cgh	546	0	0	0	0	0	0
14,987	CBD 1	0.34	46621203	0	cr	584	0	0	0	0	0	0
30,258	CBD 2	0.69	46509136	0	il	1,178	0	0	0	0	0	0
22,554	CBD 2	0.52	46509325	0	il	878	0	0	0	0	0	0
633,183	CBD 2	14.54	46840001T	0	pcce	24,654	0	0	0	0	0	0
231	CBD 2	0.01	46821449U	0	pgo	9	0	0	0	0	0	0
231	CBD 2	0.01	46821442U	0	pgo	9	0	0	0	0	0	0
51,021	CBD 1	1.17	46621220	0	cp	0	0	0	0	0	0	0
12,510	CBD 1	0.29	46621204	0	cr	487	0	0	0	0	0	0
35,958	Special District	0.83	46513119	U	il	1,400	15,415	2,004	26,985	3,508	38,555	5,012
4,000	CBD 2	0.09	46509501T	0	road	156	0	0	0	0	0	0
36,621	CBD 2	0.84	46504021S	0	il	1,426	0	0	0	0	0	0
26,287	CBD 2	0.60	46825111	0	co	1,024	0	0	0	0	0	0
36,112	CBD 1	0.83	46624005	0	cgh	1,406	0	0	0	0	0	0
17,639	CBD 1	0.40	46617212	0	cr	687	0	0	0	0	0	0
16	0	0.00	46509317T	0	il	1	0	0	0	0	0	0
37,020	CBD 2	0.85	46509321	U	il	1,441	42,498	8,585	65,413	13,213	88,328	17,842
33,814	CBD 2	0.78	46509327	U	il	1,317	38,818	7,841	59,749	12,069	80,680	16,297
67,184	0	1.54	46703036U	0	ilv	2,616	0	0	0	0	0	0
9,997	CBD 1	0.23	46621213T	0	cr	389	0	0	0	0	0	0
54,387	CBD 2	1.25	46509218	U	il	2,118	62,437	12,612	96,102	19,413	129,768	26,213
123,511	CBD 1	2.84	46621520T	0	cp	0	0	0	0	0	0	0
231	CBD 2	0.01	46821428U	0	pgo	9	0	0	0	0	0	0
32,056	CBD 2	0.74	46821220T	VACANT	co	1,248	36,800	7,434	0	0	76,486	15,450
51,518	CBD 2	1.18	46821527	0	co	2,006	0	0	0	0	0	0
11,269	CBD 1	0.26	46825110	0	co	439	0	0	0	0	0	0
32,425	0	0.74	46703013U	0	il	1,263	0	0	0	0	0	0
6,980	CBD 1	0.16	46627001	0	cr	272	0	0	0	0	0	0
1,752	CBD 1	0.04	46627X02	0	cr	68	0	0	0	0	0	0
14,140	CBD 2	0.32	46825112	0	co	551	0	0	0	0	0	0
6,758	CBD 1	0.16	46617215	0	cr	263	0	0	0	0	0	0
57,195	0	1.31	46703022U	0	v	0	0	0	0	0	0	0
231	CBD 2	0.01	46821435U	0	pgo	9	0	0	0	0	0	0
21,476	CBD 2	0.49	46509222	U	il	836	24,655	4,980	37,949	7,666	51,242	10,351
10,860	CBD 1	0.25	46621325T	0	cr	423	0	0	0	0	0	0
11,279	CBD 1	0.26	46825108	E	cgh	439	0	0	0	0	0	0
675	CBD 1	0.02	46627X01	0	cr	26	0	0	0	0	0	0
231	CBD 2	0.01	46821429U	0	pgo	9	0	0	0	0	0	0
18,335	CBD 1	0.42	46617208	0	cr	714	0	0	0	0	0	0
64,835	CBD 2	1.49	46513219	U	il	2,524	74,431	15,035	114,563	23,142	154,696	31,249
8,406	CBD 2	0.19	46825115	0	cgh	327	0	0	0	0	0	0
43,372	CBD 2	1.00	46821521	0	co	1,689	0	0	0	0	0	0
3,444	CBD 1	0.08	46621324	0	cr	134	0	0	0	0	0	0
26,140	CBD 2	0.60	46509325	0	il	1,018	0	0	0	0	0	0
26,324	CBD 1	0.60	46825114	U	cgh	1,025	45,103	9,201	102,713	20,953	160,323	32,706
8,238	CBD 1	0.19	46621302	0	cr	321	0	0	0	0	0	0
11,288	CBD 2	0.26	46825104	0	cgh	440	0	0	0	0	0	0
14,467	CBD 2	0.33	46703023S	0	il	563	16,608	3,355	25,562	5,164	34,517	6,972
37,725	CBD 2	0.87	46509215	0	il	1,469	0	0	0	0	0	0
18,742	CBD 1	0.43	46825402	VACANT	v	0	32,112	6,551	73,128	14,918	114,145	23,286
7,968	CBD 1	0.18	46617207	0	cr	310	0	0	0	0	0	0
7,491	CBD 1	0.17	46621303	0	cr	292	0	0	0	0	0	0
800	CBD 2	0.02	46513218T	U	il	31	918	186	1,414	286	1,909	386
34,138	CBD 1	0.78	46621332	0	pgo	1,329	0	0	0	0	0	0
2,200	CBD 2	0.05	46513211T	U	pps	86	2,526	510	3,888	785	5,249	1,060
199	CBD 2	0.00	46513216T	U	v	0	229	46	352	71	476	96
3,971	CBD 1	0.09	46621304	0	cr	155	0	0	0	0	0	0
127,340	CBD 2	2.92	46509436U	U	il	4,958	146,186	29,530	225,009	45,452	303,832	61,374
15,069	CBD 2	0.35	46703019S	0	il	587	17,299	3,494	26,627	5,379	35,954	7,263
19,030	CBD 2	0.44	46821530	0	co	741	0	0	0	0	0	0
3,729	CBD 1	0.09	46825400	VACANT	v	0	6,390	1,303	14,551	2,968	22,713	4,633
132	0	0.00	46509326T	0	il	5	0	0	0	0	0	0
7,269	CBD 1	0.17	46621305	0	cr	283	0	0	0	0	0	0
11,302	CBD 1	0.26	46825105	0	cgh	440	0	0	0	0	0	0
18,827	CBD 2	0.43	46825211	U	cgh	733	21,614	4,366	33,268	6,720	44,922	9,074
3,748	CBD 1	0.09	46621306	0	cr	146	0	0	0	0	0	0
27,130	CBD 1	0.62	46825410	0	cr	1,056	0	0	0	0	0	0
15,336	CBD 1	0.35	46825403	EU	cgh	597	26,276	5,360	59,838	12,207	93,400	19,054
90,676	CBD 1	2.08	46621333	0	pgo	3,531	0	0	0	0	0	0
14,995	CBD 1	0.34	46621307	E	cr	584	0	0	0	0	0	0
29,590	CBD 2	0.68	46703025S	0	il	1,152	0	0	0	0	0	0
34,263	CBD 1	0.79	46621330T	0	pgo	1,334	0	0	0	0	0	0
11,242	CBD 2	0.26	46825203	0	cgh	438	0	0	0	0	0	0
18,254	CBD 2	0.42	46706116	0	il	711	0	0	0	0	0	0
14,249	CBD 2	0.33	46821529	0	co	555	0	0	0	0	0	0

SHERWOOD Design Engineers

PARCEL INFO				EXISTING			MIN PROPOSED FAR		MED PROPOSED FAR		MAX PROPOSED FAR	
AREA (sf)	ZONE	AREA (ac)	APN	BUILDING CONDITION	LAND USE (COF)	AVERAGE DAILY FLOW (gpd)	TOTAL BUILDING AREA (SF)	AVERAGE DAILY FLOW (gpd)	TOTAL BUILDING AREA (SF)	AVERAGE DAILY FLOW (gpd)	TOTAL BUILDING AREA (SF)	AVERAGE DAILY FLOW (gpd)
7,180	CBD 1	0.16	46825417	U	cgh	280	12,302	2,510	28,015	5,715	43,728	8,920
117,060	CBD 2	2.69	46821617T	0	cgh	4,558	0	0	0	0	0	0
15,069	CBD 1	0.35	46825210	0	cgh	587	0	0	0	0	0	0
3,753	CBD 1	0.09	46825405	0	cgh	146	0	0	0	0	0	0
11,279	CBD 1	0.26	46825406	0	cgh	439	0	0	0	0	0	0
30,056	CBD 2	0.69	46825204	U	cgh	1,170	34,505	6,970	53,109	10,728	71,714	14,486
25,726	CBD 2	0.59	46706121	0	il	1,002	0	0	0	0	0	0
12,976	CBD 2	0.30	46706113	E	il	505	0	0	0	0	0	0
60,284	CBD 1	1.38	46621334	U	cp	0	103,287	21,071	235,218	47,984	367,149	74,898
6,662	CBD 1	0.15	46825406	0	cr	259	0	0	0	0	0	0
182,716	0	4.19	46703032U	0	ilv	7,114	0	0	0	0	0	0
24,797	CBD 1	0.57	46828101	E	cr	966	0	0	0	0	0	0
7,518	CBD 1	0.17	46825408	0	cr	293	0	0	0	0	0	0
11,298	CBD 1	0.26	46825209T	U	cgh	440	19,357	3,949	44,082	8,993	68,806	14,037
67,823	CBD 2	1.56	46513312	U	il	2,641	77,860	15,728	119,842	24,208	161,824	32,688
2,290	0	0.05	46513313T	U	il	89	0	0	0	0	0	0
18,808	CBD 1	0.43	46825407	0	cr	732	0	0	0	0	0	0
19,846	CBD 2	0.46	46706115	0	cgh	773	0	0	0	0	0	0
144,811	CBD 2	3.32	46706414	U	il	5,639	166,243	33,581	255,880	51,688	345,518	69,795
11,295	CBD 1	0.26	46825208T	EU	cgh	440	19,351	3,948	44,069	8,990	68,787	14,033
28,734	CBD 1	0.66	46825514	0	rh	3,651	0	0	0	0	0	0
34,310	CBD 2	0.79	46706120	U	co	1,336	39,388	7,956	60,625	12,246	81,863	16,536
38,958	CBD 1	0.89	46703017	E	il	1,517	0	0	0	0	0	0
7,648	CBD 1	0.18	4682844	0	ccr	298	0	0	0	0	0	0
7,513	CBD 1	0.17	46828102	0	cr	293	0	0	0	0	0	0
6,026	CBD 1	0.14	46825207	E	cgh	235	0	0	0	0	0	0
8,366	CBD 1	0.19	46828442	0	ccr	326	0	0	0	0	0	0
5,266	CBD 1	0.12	46825206	E	cgh	205	0	0	0	0	0	0
7,618	CBD 1	0.17	46828103	0	cr	297	0	0	0	0	0	0
11,300	CBD 1	0.26	46825205	E	cgh	440	0	0	0	0	0	0
180,475	CBD 2	4.14	46822420	0	cgh	7,027	0	0	0	0	0	0
6,001	CBD 2	0.14	46825301	0	cgh	234	0	0	0	0	0	0
135,222	CBD 1	3.10	46828443T	0	ccr	5,265	0	0	0	0	0	0
7,089	CBD 1	0.16	46828104	0	cr	276	0	0	0	0	0	0
30,099	CBD 1	0.69	46825507	0	cr	1,172	0	0	0	0	0	0
5,975	CBD 1	0.14	46825515	U	cgh	233	10,238	2,088	23,314	4,756	36,391	7,424
35,254	CBD 2	0.81	46825318	0	cgh	1,373	0	0	0	0	0	0
220,413	CBD 1	5.06	46828444T	0	ccr	8,582	0	0	0	0	0	0
11,596	CBD 1	0.27	46828105	0	cr	452	0	0	0	0	0	0
11,299	CBD 1	0.26	46706211	0	cgh	440	0	0	0	0	0	0
25,276	CBD 1	0.58	46825511T	0	cp	0	0	0	0	0	0	0
11,271	CBD 1	0.26	46706203	U	cgh	439	19,310	3,939	43,976	8,971	68,641	14,003
22,522	CBD 2	0.52	46825316	U	cgh	877	25,855	5,223	39,796	8,039	53,736	10,855
28,596	CBD 1	0.66	46703004	0	il	1,113	0	0	0	0	0	0
26,653	CBD 2	0.61	46710112	0	il	1,038	0	0	0	0	0	0
22,594	Chinatown District	0.52	46706210	U	cgh	880	20,002	3,920	25,968	5,090	31,934	6,259
10,595	CBD 1	0.24	46828221T	0	cr	413	0	0	0	0	0	0
30,110	CBD 1	0.69	46825515T	0	cp	0	0	0	0	0	0	0
11,271	CBD 1	0.26	46706204U	0	cgh	439	0	0	0	0	0	0
18,769	CBD 2	0.43	46825318	E	cgh	731	0	0	0	0	0	0
15,714	CBD 1	0.36	46828219	E	cr	612	0	0	0	0	0	0
7,514	CBD 1	0.17	46706205	VACANT	cgh	293	12,874	2,626	29,318	5,981	45,763	9,336
15,022	CBD 2	0.34	46825311T	U	cgh	585	17,245	3,484	26,544	5,362	35,842	7,240
38,288	CBD 2	0.88	46710113	U	cgh	1,491	43,955	8,879	67,655	13,666	91,355	18,454
11,271	CBD 1	0.26	46706206	EU	cgh	439	19,312	3,940	43,979	8,972	68,646	14,004
30,026	CBD 2	0.69	46825601	0	cgh	1,169	0	0	0	0	0	0
390,921	0	8.97	46704021U	0	ilv	15,221	0	0	0	0	0	0
26,328	Chinatown District	0.60	46706209	U	cgh	1,025	23,308	4,568	30,260	5,931	37,212	7,294
3,759	CBD 1	0.09	46828227	E	cr	146	0	0	0	0	0	0
7,512	CBD 2	0.17	46825315T	U	cgh	292	8,624	1,742	13,274	2,681	17,924	3,621
7,520	Chinatown District	0.17	46706501	0	cgh	293	0	0	0	0	0	0
8,898	CBD 2	0.20	46706415	U	il	346	10,215	2,063	15,723	3,176	21,231	4,288
7,518	CBD 1	0.17	46706207	VACANT	cgh	293	12,881	2,628	29,334	5,984	45,787	9,341
3,759	CBD 1	0.09	46828201	0	cr	146	0	0	0	0	0	0
21,560	CBD 2	0.49	46822218	U	il	838	24,751	5,000	38,097	7,696	51,443	10,391
26,308	CBD 1	0.60	46828223T	0	cr	1,024	0	0	0	0	0	0
52,649	CBD 1	1.21	467040245	0	il	2,050	0	0	0	0	0	0
15,028	CBD 2	0.34	46825309	E	co	585	0	0	0	0	0	0
3,752	Chinatown District	0.09	46706510	0	cgh	146	0	0	0	0	0	0
13,024	CBD 2	0.30	468222127	0	il	507	0	0	0	0	0	0
39,432	CBD 1	0.91	467030298	0	v	0	0	0	0	0	0	0
59,990	CBD 2	1.38	46826118	U	cgh	2,336	68,869	13,911	106,002	21,412	143,136	28,913
7,504	Chinatown District	0.17	46706509	U	cgh	292	6,643	1,302	8,624	1,690	10,606	2,079
11,263	Cultural Arts/ South Stadium Distric	0.26	46825610	U	cgh	439	8,511	1,634	15,447	2,966	22,383	4,298
11,287	Chinatown District	0.26	46706208	0	cgh	439	0	0	0	0	0	0

SHERWOOD Design Engineers

PARCEL INFO				EXISTING			MIN PROPOSED FAR		MED PROPOSED FAR		MAX PROPOSED FAR	
AREA (sf)	ZONE	AREA (ac)	APN	BUILDING CONDITION	LAND USE (COF)	AVERAGE DAILY FLOW (gpd)	TOTAL BUILDING AREA (SF)	AVERAGE DAILY FLOW (gpd)	TOTAL BUILDING AREA (SF)	AVERAGE DAILY FLOW (gpd)	TOTAL BUILDING AREA (SF)	AVERAGE DAILY FLOW (gpd)
3,752	Chinatown District	0.09	46706503	0	cgh	146	0	0	0	0	0	0
11,301	CBD 1	0.26	46706338	VACANT	v	0	19,362	3,950	44,093	8,995	68,825	14,040
7,506	CBD 2	0.17	46825612	0	cgh	292	0	0	0	0	0	0
60,115	Chinatown District	1.38	46706508T	U	pfs	2,341	53,219	10,431	69,093	13,542	84,967	16,654
16,813	CBD 2	0.39	46710111	0	cgh	655	0	0	0	0	0	0
11,258	Chinatown District	0.26	46706511	E	cgh	438	0	0	0	0	0	0
7,508	Cultural Arts/ South Stadium Distric	0.17	46825609	E	cgh	292	0	0	0	0	0	0
7,506	CBD 2	0.17	46825611	0	cgh	292	0	0	0	0	0	0
11,261	Cultural Arts/ South Stadium Distric	0.26	46825608	0	cgh	438	0	0	0	0	0	0
3,757	CBD 1	0.09	46706303	VACANT	v	0	6,437	1,313	14,658	2,990	22,880	4,668
11,288	CBD 2	0.26	46826114	0	cgh	440	0	0	0	0	0	0
57,031	CBD 2	1.31	46822519	0	pqch	2,221	0	0	0	0	0	0
7,506	Chinatown District	0.17	46706506	VACANT	v	0	6,645	1,302	8,627	1,691	10,609	2,079
1,878	CBD 1	0.04	46706304	VACANT	v	0	3,218	657	7,329	1,495	11,440	2,334
15,022	CBD 2	0.34	46825605	0	cgh	585	0	0	0	0	0	0
11,945	CBD 1	0.27	46706344	VACANT	v	0	20,466	4,175	46,608	9,508	72,750	14,841
7,525	CBD 2	0.17	46822209	U	il	293	8,639	1,745	13,297	2,686	17,955	3,627
117,099	CBD 1	2.69	46828445T	0	ccr	4,559	0	0	0	0	0	0
18,775	Chinatown District	0.43	46706507	VACANT	v	0	16,621	3,258	21,579	4,229	26,536	5,201
18,868	Chinatown District	0.43	46706334	U	cgh	735	16,704	3,274	21,686	4,250	26,668	5,227
30,078	Cultural Arts/ South Stadium Distric	0.69	46828314	EU	cgh	1,171	22,730	4,364	41,253	7,921	59,777	11,477
7,507	Cultural Arts/ South Stadium Distric	0.17	46825607	0	cgh	292	0	0	0	0	0	0
7,523	CBD 2	0.17	46826116	E	cgh	293	0	0	0	0	0	0
15,015	CBD 2	0.34	46822217	0	il	585	17,237	3,482	26,532	5,359	35,826	7,237
4,958	CBD 1	0.11	46706339	VACANT	v	0	8,495	1,733	19,345	3,946	30,195	6,160
7,506	Cultural Arts/ South Stadium Distric	0.17	46825606	U	cgh	292	5,672	1,089	10,295	1,977	14,918	2,864
7,523	CBD 2	0.17	46826117	VACANT	cgh	293	8,636	1,745	13,293	2,685	17,950	3,626
22,534	Chinatown District	0.52	46710201	0	cgh	877	0	0	0	0	0	0
3,756	CBD 1	0.09	46706311	VACANT	v	0	6,435	1,313	14,654	2,990	22,874	4,666
43,669	CBD 2	1.00	46822520	U	cgh	1,700	50,132	10,127	77,163	15,587	104,194	21,047
7,506	Cultural Arts/ South Stadium Distric	0.17	46825605	E	cgh	292	0	0	0	0	0	0
11,266	CBD 1	0.26	46706312	VACANT	v	0	19,303	3,938	43,959	8,968	68,615	13,998
7,523	CBD 2	0.17	46826112	0	cgh	293	0	0	0	0	0	0
3,763	Chinatown District	0.09	46706333	0	cgh	147	0	0	0	0	0	0
60,225	Chinatown District	1.38	46704012S	0	il	2,345	0	0	0	0	0	0
22,558	CBD 2	0.52	46826414	U	cgh	878	25,897	5,231	39,860	8,052	53,824	10,872
13,985	Cultural Arts/ South Stadium Distric	0.32	46828312	E	cgh	545	0	0	0	0	0	0
1,881	Chinatown District	0.04	46706332	VACANT	cgh	73	1,665	326	2,162	424	2,659	521
7,513	Cultural Arts/ South Stadium Distric	0.17	46825604	VACANT	cgh	293	5,677	1,090	10,304	1,978	14,930	2,867
7,523	CBD 2	0.17	46826111	VACANT	v	0	8,636	1,745	13,293	2,685	17,949	3,626
1,881	Chinatown District	0.04	46706331	E	cgh	73	0	0	0	0	0	0
3,762	Chinatown District	0.09	46706330	VACANT	v	0	3,331	653	4,324	848	5,318	1,042
6,158	CBD 1	0.14	46706335	VACANT	v	0	10,551	2,152	24,029	4,902	37,506	7,651
191,242	Proposed Open Space	4.39	46704020ST	0	cp	0	0	0	0	0	0	0
686	0	0.02	46828434T	0	ccr	27	0	0	0	0	0	0
26,285	CBD 2	0.60	46822320T	VACANT	pfs	1,023	30,175	6,095	46,446	9,382	62,716	12,669
7,524	Chinatown District	0.17	46706329	VACANT	v	0	6,661	1,306	8,648	1,695	10,634	2,084
9,414	Chinatown District	0.22	46706615	U	cgh	367	8,334	1,633	10,820	2,121	13,306	2,608
7,526	Cultural Arts/ South Stadium Distric	0.17	46828307	EU	cgh	293	5,687	1,092	10,322	1,982	14,957	2,872
18,767	CBD 2	0.43	46826110	U	cgh	731	21,544	4,352	33,161	6,699	44,778	9,045
3,520	CBD 1	0.08	46706337	0	il	137	0	0	0	0	0	0
28,464	Proposed Open Space	0.65	46704022ST	0	cp	0	0	0	0	0	0	0
15,023	Chinatown District	0.34	46710202	VACANT	v	0	13,300	2,607	17,267	3,384	21,234	4,162
3,495	Cultural Arts/ South Stadium Distric	0.08	46828311	0	cgh	136	0	0	0	0	0	0
1,225	Chinatown District	0.03	46706328	VACANT	v	0	1,084	213	1,408	276	1,731	339
22,587	Cultural Arts/ South Stadium Distric	0.52	46828304	E	cgh	879	0	0	0	0	0	0
1,881	Chinatown District	0.04	46706326	VACANT	v	0	1,665	326	2,162	424	2,658	521
5,632	Chinatown District	0.13	46706613	U	cgh	219	4,986	977	6,474	1,269	7,961	1,560
3,494	Cultural Arts/ South Stadium Distric	0.08	46828310	0	cgh	136	0	0	0	0	0	0
7,523	Chinatown District	0.17	46706325	VACANT	v	0	6,660	1,305	8,646	1,695	10,633	2,084
1,584	CBD 1	0.04	46706318	VACANT	v	0	2,714	554	6,180	1,261	9,647	1,968
31,030	Cultural Arts/ South Stadium Distric	0.71	46826412	E	cgh	1,208	0	0	0	0	0	0
11,279	CBD 2	0.26	46826404	U	cgh	439	12,949	2,616	19,930	4,026	26,912	5,436
9,610	CBD 2	0.22	46826220	0	cgh	374	0	0	0	0	0	0
17,465	Cultural Arts/ South Stadium Distric	0.40	46828315	0	cgh	680	0	0	0	0	0	0
15,021	Chinatown District	0.34	46706602	U	cgh	585	13,298	2,606	17,264	3,384	21,231	4,161
22,558	Chinatown District	0.52	46710203	0	cgh	878	0	0	0	0	0	0
6,370	CBD 2	0.15	46826203	VACANT	v	0	7,313	1,477	0	0	15,199	3,070
3,149	Chinatown District	0.07	46706319	VACANT	v	0	2,788	546	3,620	709	4,451	872
7,533	Chinatown District	0.17	46707101	0	cgh	293	0	0	0	0	0	0
656	Chinatown District	0.02	46706327	0	v	0	0	0	0	0	0	0
7,020	Cultural Arts/ South Stadium Distric	0.16	46828601	VACANT	v	0	5,305	1,019	9,628	1,849	13,952	2,679
11,279	Chinatown District	0.26	46706608	U	cgh	439	9,985	1,957	12,964	2,541	15,942	3,125
26,316	CBD 2	0.60	46826413	U	cgh	1,025	30,211	6,103	46,500	9,393	62,790	12,683
6,500	CBD 2	0.15	46826203	E	v	0	0	0	0	0	0	0

SHERWOOD Design Engineers

PARCEL INFO				EXISTING			MIN PROPOSED FAR		MED PROPOSED FAR		MAX PROPOSED FAR	
AREA (sf)	ZONE	AREA (ac)	APN	BUILDING CONDITION	LAND USE (COF)	AVERAGE DAILY FLOW (gpd)	TOTAL BUILDING AREA (SF)	AVERAGE DAILY FLOW (gpd)	TOTAL BUILDING AREA (SF)	AVERAGE DAILY FLOW (gpd)	TOTAL BUILDING AREA (SF)	AVERAGE DAILY FLOW (gpd)
750	Chinatown District	0.02	46706320	VACANT	v	0	664	130	862	169	1,060	208
1,879	Chinatown District	0.04	46707102	0	cgh	73	0	0	0	0	0	0
11,557	CBD 2	0.27	4682252	U	rh	1,468	13,268	2,680	20,422	4,125	27,576	5,570
1,499	Chinatown District	0.03	46706321	VACANT	v	0	1,327	260	1,723	338	2,119	415
5,882	Chinatown District	0.14	46706336	U	cgh	229	5,207	1,021	6,760	1,325	8,313	1,629
9,394	Chinatown District	0.22	46707103T	0	cp	0	0	0	0	0	0	0
14,955	CBD 2	0.34	4682262-	U	rmh	1,900	17,168	3,468	26,425	5,338	35,682	7,208
7,511	Chinatown District	0.17	46706603	0	cgh	292	0	0	0	0	0	0
8,031	Cultural Arts/ South Stadium Distric	0.18	4682861	E	cgh	313	0	0	0	0	0	0
6,982	Cultural Arts/ South Stadium Distric	0.16	46828307	0	cgh	272	0	0	0	0	0	0
11,274	Chinatown District	0.26	46706607	0	cgh	439	0	0	0	0	0	0
18,851	CBD 2	0.43	4682621	U	cgh	734	21,641	4,371	33,309	6,728	44,977	9,085
10,890	CBD 2	0.25	4682621	0	cgh	424	0	0	0	0	0	0
7,523	Cultural Arts/ South Stadium Distric	0.17	4682860	E	cgh	293	0	0	0	0	0	0
7,511	Chinatown District	0.17	46706604	VACANT	v	0	6,650	1,303	8,633	1,692	10,617	2,081
3,758	Chinatown District	0.09	46707104T	U	cp	0	3,327	652	4,319	847	5,311	1,041
10,463	Cultural Arts/ South Stadium Distric	0.24	4682831	U	cgh	407	7,907	1,518	14,351	2,755	20,794	3,992
4,377	Chinatown District	0.10	46707117	E	v	0	0	0	0	0	0	0
26,328	Cultural Arts/ South Stadium Distric	0.60	46829113T	E	cgh	1,025	0	0	0	0	0	0
3,758	Chinatown District	0.09	46707105T	U	cp	0	3,327	652	4,319	847	5,312	1,041
10,188	Cultural Arts/ South Stadium Distric	0.23	4682641	E	cgh	397	0	0	0	0	0	0
11,221	Cultural Arts/ South Stadium Distric	0.26	4682861	VACANT	cgh	437	8,479	1,628	15,390	2,955	22,300	4,282
7,672	Cultural Arts/ South Stadium Distric	0.18	4682860-	0	cgh	298	0	0	0	0	0	0
37,593	Chinatown District	0.86	46706606	E	cgh	1,464	0	0	0	0	0	0
7,512	Chinatown District	0.17	46706612	U	cgh	292	6,650	1,303	8,634	1,692	10,617	2,081
21,938	Chinatown District	0.50	46707116	E	cgh	854	0	0	0	0	0	0
11,275	Chinatown District	0.26	46707106	U	cp	0	9,981	1,956	12,959	2,540	15,936	3,123
14,519	CBD 2	0.33	4682621	0	cgh	565	0	0	0	0	0	0
18,904	CBD 2	0.43	4682262	0	il	736	0	0	0	0	0	0
11,131	Cultural Arts/ South Stadium Distric	0.26	46828605T	0	cgh	433	0	0	0	0	0	0
15,025	Chinatown District	0.34	46710301	0	pqch	585	0	0	0	0	0	0
7,487	Cultural Arts/ South Stadium Distric	0.17	4682641	U	cgh	292	5,658	1,086	10,269	1,972	14,880	2,857
7,246	CBD 2	0.17	4682621	0	cgh	282	0	0	0	0	0	0
7,512	Chinatown District	0.17	46706611	VACANT	v	0	6,650	1,303	8,634	1,692	10,617	2,081
7,479	Cultural Arts/ South Stadium Distric	0.17	4682861	E	cgh	291	0	0	0	0	0	0
22,549	Chinatown District	0.52	46707118	U	cgh	878	19,962	3,913	25,917	5,080	31,871	6,247
3,003	Cultural Arts/ South Stadium Distric	0.07	4682640	U	cgh	117	2,269	436	4,119	791	5,968	1,146
14,492	CBD 2	0.33	4682621	0	cgh	564	0	0	0	0	0	0
18,737	Chinatown District	0.43	46704007	VACANT	v	0	16,587	3,251	21,535	4,221	26,483	5,191
7,243	CBD 2	0.17	4682620	VACANT	v	0	8,315	1,680	12,798	2,585	17,281	3,491
7,478	Cultural Arts/ South Stadium Distric	0.17	4682860	E	cgh	291	0	0	0	0	0	0
18,798	Cultural Arts/ South Stadium Distric	0.43	4682860	EU	cgh	732	14,205	2,727	25,781	4,950	37,358	7,173
20,906	Cultural Arts/ South Stadium Distric	0.48	4682911	U	cgh	814	15,798	3,033	28,672	5,505	41,547	7,977
26,077	CBD 2	0.60	4682651	U	cgh	1,015	29,936	6,047	46,078	9,308	62,220	12,568
8,216	Cultural Arts/ South Stadium Distric	0.19	4682640	U	cgh	320	6,209	1,192	11,268	2,164	16,328	3,135
7,513	Chinatown District	0.17	46710302	EU	cgh	293	6,651	1,304	8,635	1,693	10,619	2,081
7,516	Chinatown District	0.17	46707115	E	cgh	293	0	0	0	0	0	0
11,277	Cultural Arts/ South Stadium Distric	0.26	4682911	U	cgh	439	8,522	1,636	15,466	2,970	22,411	4,303
26,162	Cultural Arts/ South Stadium Distric	0.60	4682860	0	cgh	1,019	0	0	0	0	0	0
3,995	Chinatown District	0.09	46707401	E1	cgh	156	0	0	0	0	0	0
23,743	Proposed Open Space	0.55	46704023ST	0	il	924	0	0	0	0	0	0
7,514	Chinatown District	0.17	46710303	E	cgh	293	0	0	0	0	0	0
5,466	Chinatown District	0.13	46707113	0	cgh	213	0	0	0	0	0	0
14,475	CBD 2	0.33	4682621	0	il	564	0	0	0	0	0	0
20,471	CBD 2	0.47	4682630	0	il	797	0	0	0	0	0	0
14,278	Chinatown District	0.33	46707402	E1	cgh	556	0	0	0	0	0	0
22,566	Cultural Arts/ South Stadium Distric	0.52	4682911	U	cgh	879	17,053	3,274	30,950	5,942	44,847	8,611
22,351	Chinatown District	0.51	46704006	0	il	870	0	0	0	0	0	0
3,508	Chinatown District	0.08	46707413	E1	v	0	0	0	0	0	0	0
11,271	Chinatown District	0.26	46710304	0	cgh	439	0	0	0	0	0	0
4,165	Chinatown District	0.10	46707112	0	cgh	162	0	0	0	0	0	0
47,825	Cultural Arts/ South Stadium Distric	1.10	4682651	U	cgh	1,862	36,140	6,939	65,593	12,594	95,045	18,249
3,483	Cultural Arts/ South Stadium Distric	0.08	4682911	VACANT	cgh	136	2,632	505	4,777	917	6,922	1,329
2,050	Chinatown District	0.05	46707114	0	cgh	80	0	0	0	0	0	0
10,449	Cultural Arts/ South Stadium Distric	0.24	4682910	0	cgh	407	0	0	0	0	0	0
11,267	Chinatown District	0.26	46707110	U	cgh	439	9,975	1,955	12,950	2,538	15,925	3,121
7,567	Chinatown District	0.17	46707201	0	cgh	295	0	0	0	0	0	0
5,362	CBD 2	0.12	4682650	0	rm	385	0	0	0	0	0	0
4,509	Chinatown District	0.10	46707403	0	cgh	176	0	0	0	0	0	0
9,017	Chinatown District	0.21	46710305	VACANT	v	0	7,983	1,565	10,364	2,031	12,745	2,498
3,350	Chinatown District	0.08	46707111	0	cgh	130	0	0	0	0	0	0
15,098	Cultural Arts/ South Stadium Distric	0.35	4682940	0	cgh	588	0	0	0	0	0	0
15,007	Chinatown District	0.34	46707412	VACANT	v	0	13,285	2,604	17,248	3,381	21,211	4,157
7,476	Cultural Arts/ South Stadium Distric	0.17	4682860	VACANT	cgh	291	5,650	1,085	10,254	1,969	14,858	2,853
5,512	CBD 2	0.13	4682650	0	rm	395	0	0	0	0	0	0

SHERWOOD Design Engineers

PARCEL INFO				EXISTING			MIN PROPOSED FAR		MED PROPOSED FAR		MAX PROPOSED FAR	
AREA (sf)	ZONE	AREA (ac)	APN	BUILDING CONDITION	LAND USE (COF)	AVERAGE DAILY FLOW (gpd)	TOTAL BUILDING AREA (SF)	AVERAGE DAILY FLOW (gpd)	TOTAL BUILDING AREA (SF)	AVERAGE DAILY FLOW (gpd)	TOTAL BUILDING AREA (SF)	AVERAGE DAILY FLOW (gpd)
7,514	Chinatown District	0.17	46707404	0	cgh	293	0	0	0	0	0	0
52,627	Chinatown District	1.21	46707202	VACANT	v	0	46,590	9,132	60,487	11,855	74,384	14,579
10,447	Cultural Arts/ South Stadium Distric	0.24	46829108	0	cgh	407	0	0	0	0	0	0
9,768	Chinatown District	0.22	46710306	VACANT	v	0	8,647	1,695	11,226	2,200	13,806	2,706
30,547	Chinatown District	0.70	467040059	0	v	0	0	0	0	0	0	0
7,249	CBD 2	0.17	46826507	VACANT	v	0	8,322	1,681	12,809	2,587	17,296	3,494
7,514	Chinatown District	0.17	46707405T	U	cp	0	6,652	1,304	8,636	1,693	10,620	2,081
15,640	CBD 2	0.36	46826305	0	il	609	0	0	0	0	0	0
7,547	Cultural Arts/ South Stadium Distric	0.17	46829402	0	cgh	294	0	0	0	0	0	0
7,520	Chinatown District	0.17	46707411	VACANT	v	0	6,657	1,305	8,643	1,694	10,629	2,083
10,875	CBD 2	0.25	46826508	E	cgh	423	0	0	0	0	0	0
10,403	Cultural Arts/ South Stadium Distric	0.24	46829107	U	cgh	405	7,861	1,509	14,268	2,739	20,674	3,969
7,513	Chinatown District	0.17	46707406T	U	cp	0	6,651	1,304	8,635	1,693	10,619	2,081
15,062	Chinatown District	0.35	46707208	0	cgh	586	0	0	0	0	0	0
59,749	Cultural Arts/ South Stadium Distric	1.37	46829406	0	cgh	2,326	0	0	0	0	0	0
15,091	Cultural Arts/ South Stadium Distric	0.35	46829407	E	cgh	588	0	0	0	0	0	0
15,042	Chinatown District	0.35	46707410T	E	cp	0	0	0	0	0	0	0
40,916	Cultural Arts/ South Stadium Distric	0.94	46829201	U	cgh	1,593	36,222	6,955	47,027	9,029	57,831	11,104
11,271	Chinatown District	0.26	46707407	0	cgh	439	0	0	0	0	0	0
45,097	Chinatown District	1.04	46711114	0	cgh	1,756	0	0	0	0	0	0
7,513	Chinatown District	0.17	46707207	EU	cgh	293	6,651	1,304	8,635	1,692	10,618	2,081
7,544	Cultural Arts/ South Stadium Distric	0.17	46829404	E	cgh	294	0	0	0	0	0	0
7,522	Chinatown District	0.17	46707409	0	cgh	293	0	0	0	0	0	0
7,247	Cultural Arts/ South Stadium Distric	0.17	46826509	0	cgh	282	0	0	0	0	0	0
7,514	Chinatown District	0.17	46707206	E	cgh	293	6,652	1,304	8,636	1,693	10,620	2,081
19,459	CBD 2	0.45	46826616	0	il	758	0	0	0	0	0	0
32,454	Cultural Arts/ South Stadium Distric	0.75	46829207	U	cgh	1,264	24,525	4,709	44,511	8,546	64,497	12,383
15,083	Cultural Arts/ South Stadium Distric	0.35	46829405	U	cgh	587	11,398	2,188	20,687	3,972	29,976	5,755
15,048	Chinatown District	0.35	46707408	0	cgh	586	0	0	0	0	0	0
9,997	0	0.23	467040185	0	v	0	0	0	0	0	0	0
7,815	Chinatown District	0.18	46707205	E1	cgh	304	6,918	1,356	8,982	1,760	11,046	2,165
11,133	Chinatown District	0.26	46707501	0	co	434	0	0	0	0	0	0
40,158	Proposed Open Space	0.92	467050218	VACANT	v	0	0	0	0	0	0	0
15,999	Chinatown District	0.37	46711111	0	cgh	623	0	0	0	0	0	0
7,215	Chinatown District	0.17	46707210	E1	cgh	281	6,387	1,252	8,292	1,625	10,197	1,999
7,426	Chinatown District	0.17	46707502	0	cgh	289	0	0	0	0	0	0
13,491	CBD 2	0.31	46826629	0	il	525	0	0	0	0	0	0
15,027	Chinatown District	0.34	46707203	EU	cgh	585	13,304	2,607	17,272	3,385	21,240	4,163
5,987	Cultural Arts/ South Stadium Distric	0.14	46826613	0	il	233	0	0	0	0	0	0
14,624	Cultural Arts/ South Stadium Distric	0.34	46829204	VACANT	pqch	569	11,051	2,122	20,058	3,851	29,064	5,580
7,428	Chinatown District	0.17	46707503	U	cp	0	6,576	1,289	8,538	1,673	10,499	2,058
18,973	Chinatown Industrial Distric	0.44	46707301	0	il	739	0	0	0	0	0	0
22,095	Cultural Arts/ South Stadium Distric	0.51	46826625	0	il	525	0	0	0	0	0	0
5,037	Chinatown District	0.12	46707512	U	cp	0	4,459	874	5,789	1,135	7,119	1,395
38,284	Cultural Arts/ South Stadium Distric	0.88	46829501	U	cgh	1,491	28,931	5,555	52,508	10,081	76,085	14,608
15,069	Chinatown District	0.35	46711113	0	cgh	587	0	0	0	0	0	0
7,431	Chinatown District	0.17	46707504	0	cgh	289	0	0	0	0	0	0
59,991	Cultural Arts/ South Stadium Distric	1.38	467050198	U	il	2,336	0	0	0	0	0	0
24,995	Chinatown District	0.57	46707513	U	cgh	973	22,126	4,337	28,726	5,630	35,325	6,924
3,531	Cultural Arts/ South Stadium Distric	0.08	46829206	0	cgh	137	0	0	0	0	0	0
17,655	Cultural Arts/ South Stadium Distric	0.41	46829205	VACANT	v	0	13,341	2,562	24,214	4,649	35,086	6,737
7,433	Chinatown District	0.17	46707505	U	cgh	289	6,580	1,290	8,543	1,674	10,506	2,059
14,671	0	0.34	46704004	0	il	571	0	0	0	0	0	0
140,282	0	3.22	46705024U	0	ilv	5,462	0	0	0	0	0	0
7,526	Chinatown Industrial Distric	0.17	46707302	E	cgh	293	0	0	0	0	0	0
18,617	Chinatown District	0.43	46707506	U	cgh	725	16,481	3,230	21,397	4,194	26,313	5,157
33,908	Chinatown Industrial Distric	0.78	46707317	EU	il	1,320	12,640	1,896	31,835	4,776	51,039	7,656
8,244	Cultural Arts/ South Stadium Distric	0.19	46829301	VACANT	v	0	6,230	1,196	11,307	2,171	16,383	3,146
7,524	Chinatown Industrial Distric	0.17	46707303	E	cgh	293	0	0	0	0	0	0
27,015	Cultural Arts/ South Stadium Distric	0.62	46829506	E	il	1,052	0	0	0	0	0	0
14,949	Chinatown District	0.34	46707509	0	rh	1,899	0	0	0	0	0	0
92,379	Chinatown District	2.12	46711701	E	pqch	3,597	0	0	0	0	0	0
3,188	Cultural Arts/ South Stadium Distric	0.07	46829315	VACANT	v	0	2,409	463	4,373	840	6,336	1,217
3,762	Chinatown Industrial Distric	0.09	46707304	E	cgh	146	0	0	0	0	0	0
3,761	Chinatown Industrial Distric	0.09	46707305	E	cgh	146	0	0	0	0	0	0
7,522	Chinatown Industrial Distric	0.17	46707306T	VACANT	v	0	2,804	421	7,063	1,059	11,322	1,698
7,514	Cultural Arts/ South Stadium Distric	0.17	46829507	VACANT	ilv	293	5,678	1,090	10,305	1,979	14,932	2,867
3,734	Chinatown District	0.09	46707508	E	cgh	145	0	0	0	0	0	0
2,618	Cultural Arts/ South Stadium Distric	0.06	46829312	U	il	102	1,978	380	3,590	689	5,202	999
11,282	Chinatown Industrial Distric	0.26	46707307T	VACANT	v	0	4,206	631	10,594	1,589	16,982	2,547
11,162	Chinatown District	0.26	46707507	U	cgh	435	0	0	0	0	0	0
11,271	Cultural Arts/ South Stadium Distric	0.26	46829503	VACANT	ilv	439	8,517	1,635	15,458	2,968	22,399	4,301
141,020	Chinatown Industrial Distric	3.24	46707615	0	il	5,491	0	0	0	0	0	0
63,774	Cultural Arts/ South Stadium Distric	1.46	467050135	0	il	2,483	0	0	0	0	0	0
30,060	Cultural Arts/ South Stadium Distric	0.69	46829505	0	il	1,170	0	0	0	0	0	0

SHERWOOD Design Engineers

PARCEL INFO				EXISTING			MIN PROPOSED FAR		MED PROPOSED FAR		MAX PROPOSED FAR	
AREA (sf)	ZONE	AREA (ac)	APN	BUILDING CONDITION	LAND USE (COF)	AVERAGE DAILY FLOW (gpd)	TOTAL BUILDING AREA (SF)	AVERAGE DAILY FLOW (gpd)	TOTAL BUILDING AREA (SF)	AVERAGE DAILY FLOW (gpd)	TOTAL BUILDING AREA (SF)	AVERAGE DAILY FLOW (gpd)
26,251	Chinatown Industrial Distric	0.60	46707316T	VACANT	v	0	9,785	1,468	24,650	3,697	39,514	5,927
4,632	Cultural Arts/ South Stadium Distric	0.11	46829317	0	il	180	0	0	0	0	0	0
19,309	Cultural Arts/ South Stadium Distric	0.44	46829309	0	il	752	0	0	0	0	0	0
14,936	Chinatown Industrial Distric	0.34	46708116T	VACANT	v	0	5,568	835	14,025	2,104	22,482	3,372
8,180	Cultural Arts/ South Stadium Distric	0.19	46829600	0	il	319	0	0	0	0	0	0
181,134	0	4.16	46705024U	0	ilv	5,462	0	0	0	0	0	0
7,439	Cultural Arts/ South Stadium Distric	0.17	46829607	0	il	290	0	0	0	0	0	0
29,894	Chinatown Industrial Distric	0.69	46708118	E	il	1,164	0	0	0	0	0	0
5,264	Cultural Arts/ South Stadium Distric	0.12	46829308	0	il	205	0	0	0	0	0	0
22,327	Cultural Arts/ South Stadium Distric	0.51	46829611	E	il	869	0	0	0	0	0	0
2,907	Chinatown Industrial Distric	0.07	46708115	0	rm	209	0	0	0	0	0	0
7,022	Cultural Arts/ South Stadium Distric	0.16	46829307	0	il	273	0	0	0	0	0	0
75,097	Proposed Open Space	1.72	46705017S	0	il	2,924	0	0	0	0	0	0
7,066	Chinatown Industrial Distric	0.16	46711703	0	cp	0	0	0	0	0	0	0
42,159	Cultural Arts/ South Stadium Distric	0.97	46829610	0	il	1,642	0	0	0	0	0	0
8,612	Chinatown Industrial Distric	0.20	46708114	E	rm	618	0	0	0	0	0	0
70,019	Chinatown Industrial Distric	1.61	46711702	0	il	2,726	0	0	0	0	0	0
5,633	Chinatown Industrial Distric	0.13	46708113	0	rm	404	0	0	0	0	0	0
5,635	Chinatown Industrial Distric	0.13	46708112	0	rm	404	0	0	0	0	0	0
143,371	Chinatown Industrial Distric	3.29	46705023S	0	v	0	0	0	0	0	0	0
5,584	Cultural Arts/ South Stadium Distric	0.13	46829606	0	il	217	0	0	0	0	0	0
7,516	Chinatown Industrial Distric	0.17	46708111	0	rm	539	0	0	0	0	0	0
15,018	Chinatown Industrial Distric	0.34	46708119	0	cgh	585	0	0	0	0	0	0
141,559	Chinatown Industrial Distric	3.25	46708422	0	ilv	5,512	0	0	0	0	0	0
5,584	Cultural Arts/ South Stadium Distric	0.13	46829607	0	il	217	0	0	0	0	0	0
7,519	Chinatown Industrial Distric	0.17	46708110	0	rm	539	0	0	0	0	0	0
7,447	Cultural Arts/ South Stadium Distric	0.17	46829608	E	il	290	0	0	0	0	0	0
8,726	Chinatown Industrial Distric	0.20	46708109	0	il	340	0	0	0	0	0	0
2,776	Chinatown Industrial Distric	0.06	46708105	E	rmh	353	0	0	0	0	0	0
14,955	Cultural Arts/ South Stadium Distric	0.34	46829609	E	il	582	0	0	0	0	0	0
26,461	Chinatown Industrial Distric	0.61	46708201	0	il	1,030	0	0	0	0	0	0
2,772	Chinatown Industrial Distric	0.06	46708106	0	rmh	352	0	0	0	0	0	0
131,247	Proposed Open Space	3.01	46705052ST	VACANT	il	5,110	0	0	0	0	0	0
6,982	Chinatown Industrial Distric	0.16	46708108	U	rmh	887	2,602	390	6,556	983	10,509	1,576
1,364	Chinatown Industrial Distric	0.03	46708107	VACANT	rmh	173	508	76	1,280	192	2,053	308
13,165	Chinatown Industrial Distric	0.30	46708212	VACANT	v	0	4,908	736	12,362	1,854	19,817	2,973
33,650	Chinatown Industrial Distric	0.77	46708220	U	il	1,310	12,543	1,881	0	0	50,650	7,597
10,737	Cultural Arts/ South Stadium Distric	0.25	46830504	VACANT	v	0	8,114	1,558	14,726	2,827	21,339	4,097
3,000	Chinatown Industrial Distric	0.07	46712101	0	co	117	0	0	0	0	0	0
5,641	Chinatown Industrial Distric	0.13	46708208	VACANT	rm	405	2,103	315	5,297	794	8,491	1,274
6,179	Chinatown Industrial Distric	0.14	46712111	0	il	241	0	0	0	0	0	0
3,701	Chinatown Industrial Distric	0.08	46712118	0	v	0	0	0	0	0	0	0
22,554	Chinatown Industrial Distric	0.52	46708211	EU	il	878	8,407	1,261	21,178	3,177	33,949	5,092
5,657	Chinatown Industrial Distric	0.13	46712115	VACANT	v	0	2,109	316	5,312	797	8,515	1,277
2,848	Chinatown Industrial Distric	0.07	46708501	VACANT	rmh	362	1,061	159	2,674	401	4,286	643
5,135	Chinatown Industrial Distric	0.12	46712113	VACANT	v	0	1,914	287	4,822	723	7,729	1,159
5,628	Chinatown Industrial Distric	0.13	46708502	0	rm	404	0	0	0	0	0	0
2,793	Chinatown Industrial Distric	0.06	46708517T	VACANT	cgh	109	1,041	156	2,622	393	4,204	631
6,723	Chinatown Industrial Distric	0.15	46712112	VACANT	v	0	2,506	376	6,313	947	10,120	1,518
7,515	Chinatown Industrial Distric	0.17	46708204	0	v	0	0	0	0	0	0	0
7,503	Chinatown Industrial Distric	0.17	46708503	0	rm	538	0	0	0	0	0	0
63,754	0	1.46	46705050U	0	ilv	2,482	0	0	0	0	0	0
11,269	Chinatown Industrial Distric	0.26	46708205	0	v	0	0	0	0	0	0	0
7,502	Chinatown Industrial Distric	0.17	46708504	VACANT	rml	538	2,797	419	7,045	1,057	11,293	1,694
48,959	Chinatown Industrial Distric	1.12	46708316	0	il	1,906	0	0	0	0	0	0
8,675	Chinatown Industrial Distric	0.20	46712117	VACANT	v	0	3,234	485	8,146	1,222	13,058	1,959
15,241	Chinatown Industrial Distric	0.35	46708516	VACANT	v	0	5,681	852	14,311	2,147	22,941	3,441
7,502	Chinatown Industrial Distric	0.17	46708505	0	rml	538	0	0	0	0	0	0
7,351	Chinatown Industrial Distric	0.17	46708506	0	rml	527	0	0	0	0	0	0
7,514	Chinatown Industrial Distric	0.17	46708515	VACANT	v	0	2,801	420	7,056	1,058	11,310	1,697
3,900	Chinatown Industrial Distric	0.09	46708507	0	v	0	0	0	0	0	0	0
96,587	Chinatown Industrial Distric	2.22	46702017	0	ilv	3,761	0	0	0	0	0	0
74,650	Chinatown Industrial Distric	1.71	46708334	0	il	2,907	0	0	0	0	0	0
7,515	Chinatown Industrial Distric	0.17	46708514	0	rml	539	0	0	0	0	0	0
7,500	Chinatown Industrial Distric	0.17	46708508	0	cgh	292	0	0	0	0	0	0
420	0	0.01	46702039U	0	v	0	0	0	0	0	0	0
6,764	Chinatown Industrial Distric	0.16	46708513	0	rml	485	0	0	0	0	0	0
7,596	Chinatown Industrial Distric	0.17	46708509	0	cgh	296	0	0	0	0	0	0
6,389	Chinatown Industrial Distric	0.15	46708512	0	rml	458	0	0	0	0	0	0
9,021	Chinatown Industrial Distric	0.21	46708511	0	cgh	351	0	0	0	0	0	0
5,651	Chinatown Industrial Distric	0.13	46708303	0	il	220	0	0	0	0	0	0
7,535	Chinatown Industrial Distric	0.17	46708327T	U	pps	293	0	0	0	0	0	0
8,185	Chinatown Industrial Distric	0.19	46708510	0	rh	1,040	0	0	0	0	0	0
5,654	Chinatown Industrial Distric	0.13	46708304	0	il	220	0	0	0	0	0	0
7,530	Chinatown Industrial Distric	0.17	46708326	0	rml	540	0	0	0	0	0	0

SHERWOOD Design Engineers

PARCEL INFO				EXISTING			MIN PROPOSED FAR		MED PROPOSED FAR		MAX PROPOSED FAR	
AREA (sf)	ZONE	AREA (ac)	APN	BUILDING CONDITION	LAND USE (COF)	AVERAGE DAILY FLOW (gpd)	TOTAL BUILDING AREA (SF)	AVERAGE DAILY FLOW (gpd)	TOTAL BUILDING AREA (SF)	AVERAGE DAILY FLOW (gpd)	TOTAL BUILDING AREA (SF)	AVERAGE DAILY FLOW (gpd)
24,066	Chinatown Industrial Distric	0.55	46708335	0	il	937	0	0	0	0	0	0
138,138	Chinatown Industrial Distric	3.17	46709234	0	rmh	17,551	0	0	0	0	0	0
33,233	Chinatown Industrial Distric	0.76	46708333I	VACANT	obp	1,975	12,388	1,858	31,205	4,681	50,022	7,503
10,009	Chinatown Industrial Distric	0.23	46708331	0	cgh	390	0	0	0	0	0	0
17,693	Chinatown Industrial Distric	0.41	46702018	0	il	689	0	0	0	0	0	0
9,872	Chinatown Industrial Distric	0.23	46708330	0	cgh	384	0	0	0	0	0	0
13,808	Chinatown Industrial Distric	0.32	46708329	0	cgh	538	0	0	0	0	0	0
230,365	CBD 1	5.28	46504033S1	0	ilv	8,970	394,692	80,517	898,839	183,363	1,402,986	286,209
48,531	CBD 1	1.11	46703034U	0	road	1,890	83,150	16,963	189,360	38,629	295,569	60,296
125,367	CBD 1	2.88	46703031S1	0	ilv	4,881	214,796	43,818	489,158	99,788	763,521	155,758
61,286	CBD 1	1.41	46703003S	0	il	2,386	105,003	21,421	239,126	48,782	373,248	76,143
57,985	CBD 1	1.33	46704025S1	0	il	2,258	99,348	20,267	226,247	46,154	353,145	72,042

ATTACHMENT 2

Sherwood Design Engineers Fire Flow Projections

SHERWOOD Design Engineers

DISTRICT	BUILDING TYPE (MAX FAR)	CONSTRUCTION TYPE
CBD 1	Tower on Podium	1A
CBD 2	Tower on Podium	1A
Civic Center		1A
Chinatown District	Flex block	3B
Cultural Arts/ South Stadium District	Flex block	3B
Chinatown Industrial District	Flex block	3B
Neighborhood General	Rowhouse	5B
Neighborhood General Preservation	Live/Work	3B
Special District	Flex block	3B
Proposed Open Space		0
0		0
District		3B

NOTES:

1. Proposed building square footage as provided by Moule & Polyzoides program received 1/3/11. Building area represents maximum possible building area by Floor Area Ratio (FAR).
2. Building Types assigned to each parcel per zone based on the land use with the maximum FAR. Building types based on 2007 California Building Code.
3. Flow rates as provided by 2007 California Fire Code, Table B105.1.
4. Fire Flow is only calculated for underutilized parcels. All other parcels are assumed not to change.

PARCEL INFO				EXISTING						PROPOSED		
AREA (sf)	ZONE	AREA (ac)	APN	BUILDING CONDITION	GROUND FLOOR USE	SUB_USE	FIRST FLOOR S.F.	BLDG STORIES	total bldg s.f.	Maximum Building Area (sf)	Construction Type	Fire Flow (gpm)
34,259	Cultural Arts/ South Stadium District	0.79	46502002	VACANT	0	0	0	0	0	0	3B	0
8,955	Cultural Arts/ South Stadium District	0.21	46502001	U	RETAIL	0	1640.38	1	1,640	17,797	3B	2,750
20,514	Cultural Arts/ South Stadium District	0.47	46613117	U	RESTAURANT	0	3774.54	1	3,775	40,769	3B	4,250
12,679	Cultural Arts/ South Stadium District	0.29	46610332	VACANT	0	0	0	0	0	25,198	3B	3,250
100,753	Cultural Arts/ South Stadium District	2.31	46618245S	0	RESIDENTIAL	0	0	0	0	0	3B	0
5,904	Cultural Arts/ South Stadium District	0.14	46610321	0	0	0	0	0	0	0	3B	0
26,089	Cultural Arts/ South Stadium District	0.60	46610331	0	CIVIC	OFFICE	0	0	0	0	3B	0
18,226	Cultural Arts/ South Stadium District	0.42	46610326	0	CIVIC	CHURCH	0	0	0	0	3B	0
17,599	Cultural Arts/ South Stadium District	0.40	46613344	0	COMMERCIAL	0	0	0	0	0	3B	0
350,138	Proposed Open Space	8.04	46502008U	VACANT	0	0	0	0	0	0	0	0
15,830	Cultural Arts/ South Stadium District	0.36	46618229	E	0	0	0	0	0	0	3B	0
6,130	Cultural Arts/ South Stadium District	0.14	46613343	0	PARKING	0	0	0	0	0	3B	0
10,733	Cultural Arts/ South Stadium District	0.25	46613333	EU	0	0	2427.52	1	2,428	21,329	3B	3,000
12,714	Cultural Arts/ South Stadium District	0.29	46613327	0	RESIDENTIAL	0	0	0	0	0	3B	0
9,941	Cultural Arts/ South Stadium District	0.23	46610122	E	RESIDENTIAL	0	0	0	0	0	3B	0
13,271	Cultural Arts/ South Stadium District	0.30	46613328	VACANT	0	0	0	0	0	26,375	3B	3,500
4,385	Cultural Arts/ South Stadium District	0.10	46613118	VACANT	0	0	0	0	0	8,714	3B	2,000
5,846	Cultural Arts/ South Stadium District	0.13	46613119	VACANT	0	0	0	0	0	11,617	3B	2,250
10,229	Cultural Arts/ South Stadium District	0.23	46613123	U	COMMERCIAL	0	6305.37	1	6,305	20,330	3B	3,000
14,730	Cultural Arts/ South Stadium District	0.34	46613124	VACANT	0	0	0	0	0	29,274	3B	3,500
3,926	Cultural Arts/ South Stadium District	0.09	46618101T	0	OPEN SPACE	0	0	0	0	0	3B	0
25,983	Cultural Arts/ South Stadium District	0.60	46618320	U	RETAIL	0	4866.97	1	4,867	51,638	3B	4,750
19,841	Cultural Arts/ South Stadium District	0.46	46618315	U	COMMERCIAL	0	3686.85	1	3,687	39,431	3B	4,250
11,992	Neighborhood General Preservation	0.28	46610312	0	RESIDENTIAL	0	0	0	0	0	3B	0
14,746	Cultural Arts/ South Stadium District	0.34	46618316	0	INDUSTRIAL	0	0	0	0	0	3B	0
18,674	Cultural Arts/ South Stadium District	0.43	46618325	U	INDUSTRIAL	0	7476.85	1	7,477	37,112	3B	4,000
9,962	Cultural Arts/ South Stadium District	0.23	46613336	0	CIVIC	CHURCH	0	0	0	0	3B	0
2,111	Cultural Arts/ South Stadium District	0.05	46613108	0	COMMERCIAL	0	0	0	0	0	3B	0
5,953	Cultural Arts/ South Stadium District	0.14	46613107	E	COMMERCIAL	0	0	0	0	0	3B	0
2,917	Cultural Arts/ South Stadium District	0.07	46613104	0	COMMERCIAL	0	0	0	0	0	3B	0
6,502	Cultural Arts/ South Stadium District	0.15	46613116	0	COMMERCIAL	0	0	0	0	0	3B	0
3,411	Cultural Arts/ South Stadium District	0.08	46613303	0	RETAIL	0	0	0	0	0	3B	0
13,568	Cultural Arts/ South Stadium District	0.31	46618240	EU	0	0	6436.13	1	6,436	26,964	3B	3,500
59,532	Neighborhood General	1.37	46610106	0	CIVIC	0	0	0	0	0	5B	0
9,878	Neighborhood General Preservation	0.23	46610304	EU	0	0	1847.44	1	1,847	7,260	3B	1,750
2,498	Cultural Arts/ South Stadium District	0.06	46613105	E	CIVIC	CHURCH	0	0	0	0	3B	0
9,713	Cultural Arts/ South Stadium District	0.22	46613304	0	RETAIL	0	0	0	0	0	3B	0
28,935	Neighborhood General Preservation	0.66	46610329	U	COMMERCIAL	0	0	0	0	21,266	3B	3,000
6,216	Neighborhood General Preservation	0.14	46610303	E	RESIDENTIAL	0	0	0	0	0	3B	0
5,981	Neighborhood General Preservation	0.14	46610302	0	RESIDENTIAL	0	0	0	0	0	3B	0
55,600	Cultural Arts/ South Stadium District	1.28	46613339	0	RESIDENTIAL	0	0	0	0	0	3B	0
19,347	Cultural Arts/ South Stadium District	0.44	46618323	U	INDUSTRIAL	0	3366.68	1	3,367	38,449	3B	4,250
4,978	Neighborhood General Preservation	0.11	46610310	VACANT	0	0	0	0	0	3,658	3B	1,500
15,016	Cultural Arts/ South Stadium District	0.34	46618239	0	HOSPITALITY	0	0	0	0	0	3B	0
11,238	Neighborhood General Preservation	0.26	46613201	E	0	0	0	0	0	0	3B	0
9,991	Cultural Arts/ South Stadium District	0.23	46613106	0	COMMERCIAL	0	0	0	0	0	3B	0
9,026	Cultural Arts/ South Stadium District	0.21	46613338	0	CIVIC	COMM CTR	0	0	0	17,938	3B	2,750
4,983	Neighborhood General Preservation	0.11	46610309	VACANT	0	0	0	0	0	0	3B	0
9,084	Cultural Arts/ South Stadium District	0.21	46613305	E	0	0	0	0	0	0	3B	0
26,894	Cultural Arts/ South Stadium District	0.62	46618415	0	INDUSTRIAL	0	0	0	0	0	3B	0
3,747	Cultural Arts/ South Stadium District	0.09	46618307	U	INDUSTRIAL	0	1992.98	1	1,993	7,448	3B	1,750
7,489	Neighborhood General Preservation	0.17	46613202	VACANT	0	0	0	0	0	5,504	3B	1,500
7,570	Cultural Arts/ South Stadium District	0.17	46613306	0	COMMERCIAL	0	0	0	0	0	3B	0
7,493	Neighborhood General Preservation	0.17	46613203	0	COMMERCIAL	0	0	0	0	0	3B	0
59,935	Neighborhood General	1.38	46610417	0	RESIDENTIAL	0	0	0	0	0	5B	0
11,269	Cultural Arts/ South Stadium District	0.26	46613213	VACANT	0	0	0	0	0	22,395	3B	3,250
15,199	Cultural Arts/ South Stadium District	0.35	46613324	U	COMMERCIAL	0	9633.94	1	9,634	30,206	3B	3,750

SHERWOOD Design Engineers

PARCEL INFO				EXISTING						PROPOSED		
AREA (sf)	ZONE	AREA (ac)	APN	BUILDING CONDITION	GROUND FLOOR USE	SUB_USE	FIRST FLOOR S.F.	BLDG STORIES	total bldg s.f.	Maximum Building Area (sf)	Construction Type	Fire Flow (gpm)
14,996	Neighborhood General Preservation	0.34	46613204	0	COMMERCIAL	0	0	0	0	0	3B	0
22,449	Cultural Arts/ South Stadium District	0.52	46619112	0	CIVIC	MUSEUM	0	0	0	0	3B	0
3,754	Cultural Arts/ South Stadium District	0.09	46613212	0	COMMERCIAL	0	0	0	0	0	3B	0
14,982	Cultural Arts/ South Stadium District	0.34	46618410	0	INDUSTRIAL	0	0	0	0	0	3B	0
7,508	Cultural Arts/ South Stadium District	0.17	46613211	U	INDUSTRIAL	0	0	0	0	14,922	3B	2,500
10,664	Cultural Arts/ South Stadium District	0.24	46618414	EU	0	0	7746.21	1	7,746	21,194	3B	3,000
15,074	Neighborhood General Preservation	0.35	46610415	0	COMMERCIAL	0	0	0	0	0	3B	0
11,256	Neighborhood General Preservation	0.26	46613205	E	0	0	0	0	0	0	3B	0
11,265	Cultural Arts/ South Stadium District	0.26	46613210	U	INDUSTRIAL	0	2121.38	1	2,121	22,387	3B	3,250
8,342	Cultural Arts/ South Stadium District	0.19	46618403	E	0	0	0	0	0	0	3B	0
26,218	Cultural Arts/ South Stadium District	0.60	46618412	0	INDUSTRIAL	0	0	0	0	0	3B	0
7,501	Cultural Arts/ South Stadium District	0.17	46613401	0	PARKING	0	0	0	0	0	3B	0
6,725	Neighborhood General Preservation	0.15	46613206	0	COMMERCIAL	0	0	0	0	0	3B	0
10,479	Cultural Arts/ South Stadium District	0.24	46619111	VACANT	0	0	0	0	0	20,826	3B	3,000
7,480	Cultural Arts/ South Stadium District	0.17	46619103	U	COMMERCIAL	0	3082.89	1	3,083	14,866	3B	2,500
18,780	Cultural Arts/ South Stadium District	0.43	46613214	0	COMMERCIAL	0	0	0	0	0	3B	0
22,578	Neighborhood General Preservation	0.52	46610409	0	COMMERCIAL	0	0	0	0	0	3B	0
14,781	Cultural Arts/ South Stadium District	0.34	46618413	VACANT	0	0	0	0	0	29,375	3B	3,750
5,621	Cultural Arts/ South Stadium District	0.13	46613402	0	COMMERCIAL	0	0	0	0	0	3B	0
22,359	Proposed Open Space	0.51	46502009U	0	INDUSTRIAL	0	0	0	0	0	0	0
44,483	Neighborhood General	1.02	46610215	0	CIVIC	CHURCH	0	0	0	0	5B	0
7,479	Cultural Arts/ South Stadium District	0.17	46619119	U	CIVIC	OFFICE	7334.75	1	7,335	14,864	3B	2,500
5,621	Cultural Arts/ South Stadium District	0.13	46613403	EU	0	0	1835.87	1	1,836	11,170	3B	2,250
13,961	Cultural Arts/ South Stadium District	0.32	46619110	0	HOSPITALITY	0	0	0	0	0	3B	0
7,479	Cultural Arts/ South Stadium District	0.17	46619118	U	CIVIC	OFFICE	7334.75	1	7,335	14,863	3B	2,500
7,494	Cultural Arts/ South Stadium District	0.17	46613404	E	0	0	0	0	0	0	3B	0
7,736	Neighborhood General Preservation	0.18	46614101	0	RESIDENTIAL	0	0	0	0	0	3B	0
7,512	Cultural Arts/ South Stadium District	0.17	46613418	VACANT	0	0	0	0	0	14,930	3B	2,500
6,783	Cultural Arts/ South Stadium District	0.16	46613207	U	RESTAURANT	0	1580.14	1	1,580	13,479	3B	2,500
18,437	Cultural Arts/ South Stadium District	0.42	46618416	U	INDUSTRIAL	0	5147.63	1	5,148	36,642	3B	4,000
14,858	Cultural Arts/ South Stadium District	0.34	46619119	U	CIVIC	OFFICE	6479.36	1	6,479	29,528	3B	3,750
11,241	Cultural Arts/ South Stadium District	0.26	46613405	U	PARKING	0	0	0	0	22,339	3B	3,250
11,275	Neighborhood General Preservation	0.26	46610417	U	PARKING	0	0	0	0	8,286	3B	2,000
45,045	Neighborhood General Preservation	1.03	46614108	0	COMMERCIAL	0	0	0	0	0	3B	0
13,950	Cultural Arts/ South Stadium District	0.32	46619109	0	HOSPITALITY	0	0	0	0	0	3B	0
22,507	Cultural Arts/ South Stadium District	0.52	46613417	U	CIVIC	SOCIAL SERVICE	9352.5	1	9,353	44,730	3B	4,500
22,485	Cultural Arts/ South Stadium District	0.52	46619401	0	RETAIL	0	0	0	0	0	3B	0
11,783	Proposed Open Space	0.27	46502010U	0	INDUSTRIAL	0	0	0	0	0	0	0
10,491	Cultural Arts/ South Stadium District	0.24	46613406	0	COMMERCIAL	0	0	0	0	0	3B	0
22,463	Cultural Arts/ South Stadium District	0.52	46614110	0	COMMERCIAL	0	0	0	0	0	3B	0
11,172	Neighborhood General Preservation	0.26	46610407	0	RESIDENTIAL	0	0	0	0	0	3B	0
24,024	Neighborhood General	0.55	46610524	U	PARKING	0	0	0	0	16,952	5B	3,500
17,386	Cultural Arts/ South Stadium District	0.40	46619108	U	PARKING	0	0	0	0	34,553	3B	4,000
12,030	Cultural Arts/ South Stadium District	0.28	46613407	0	COMMERCIAL	0	0	0	0	0	3B	0
7,200	Cultural Arts/ South Stadium District	0.17	46613411	U	PARKING	0	0	0	0	14,308	3B	2,500
22,457	Cultural Arts/ South Stadium District	0.52	46619201	E	0	0	0	0	0	0	3B	0
6,494	Cultural Arts/ South Stadium District	0.15	46614111	0	COMMERCIAL	0	0	0	0	0	3B	0
7,497	Cultural Arts/ South Stadium District	0.17	46619410	VACANT	0	0	0	0	0	14,900	3B	2,500
7,491	Cultural Arts/ South Stadium District	0.17	46619402	0	INDUSTRIAL	0	0	0	0	0	3B	0
14,747	Neighborhood General	0.34	46610208	E	0	0	0	0	0	0	5B	0
11,546	Cultural Arts/ South Stadium District	0.27	46613410	0	CIVIC	CHURCH	0	0	0	0	3B	0
46,363	Cultural Arts/ South Stadium District	1.06	46614104	0	COMMERCIAL	0	0	0	0	0	3B	0
8,020	Neighborhood General	0.18	46610523	U	PARKING	0	0	0	0	5,659	5B	2,000
7,492	Cultural Arts/ South Stadium District	0.17	46619409	VACANT	0	0	0	0	0	14,889	3B	2,500
39,959	Neighborhood General	0.92	46610525	U	PARKING	0	0	0	0	0	5B	0
29,992	Cultural Arts/ South Stadium District	0.69	46619419	0	RESIDENTIAL	0	0	0	0	0	3B	0
7,998	Neighborhood General	0.18	46610522	U	PARKING	0	0	0	0	5,643	5B	2,000
29,980	Cultural Arts/ South Stadium District	0.69	46619418	0	RESIDENTIAL	0	0	0	0	0	3B	0
3,755	Cultural Arts/ South Stadium District	0.09	46613408	E	0	0	0	0	0	0	3B	0
33,717	Cultural Arts/ South Stadium District	0.77	46614408	0	COMMERCIAL	0	0	0	0	0	3B	0
11,880	Cultural Arts/ South Stadium District	0.27	46619210	EU	0	0	3083.43	1	3,083	23,610	3B	3,250
26,211	Cultural Arts/ South Stadium District	0.60	46619216	VACANT	0	0	0	0	0	52,090	3B	4,750
11,993	Neighborhood General	0.28	46610521	0	RESIDENTIAL	0	0	0	0	0	5B	0
7,511	Cultural Arts/ South Stadium District	0.17	46613409	U	COMMERCIAL	0	3853.47	1	3,853	14,926	3B	2,500
210,125	Proposed Open Space	4.82	46503013U	0	0	0	0	0	0	0	0	0
19,917	Neighborhood General	0.46	46611124	0	0	0	0	0	0	0	5B	0
35,826	Neighborhood General	0.82	46610520	U	PARKING	0	0	0	0	25,280	5B	4,250
12,581	Cultural Arts/ South Stadium District	0.29	46619211	U	PARKING	0	0	0	0	25,002	3B	3,250
7,506	Neighborhood General	0.17	46614201	U	PARKING	0	0	0	0	5,297	5B	2,000
37,462	Cultural Arts/ South Stadium District	0.86	46614407	U	CIVIC	FARMERS MARKET	0	0	0	74,451	3B	5,750
43,860	Neighborhood General	1.01	46611125	0	CIVIC	SUPERIOR COURT	0	0	0	0	5B	0
7,499	Neighborhood General	0.17	46614202	U	PARKING	0	0	0	0	5,292	5B	2,000

SHERWOOD Design Engineers

PARCEL INFO				EXISTING						PROPOSED		
AREA (sf)	ZONE	AREA (ac)	APN	BUILDING CONDITION	GROUND FLOOR USE	SUB_USE	FIRST FLOOR S.F.	BLDG STORIES	total bldg s.f.	Maximum Building Area (sf)	Construction Type	Fire Flow (gpm)
15,016	Cultural Arts/ South Stadium District	0.34	46619419	0	RESIDENTIAL	0	0	0	0	0	3B	0
6,989	Cultural Arts/ South Stadium District	0.16	46619207	U	PARKING	0	0	0	0	13,889	3B	2,500
11,244	Cultural Arts/ South Stadium District	0.26	46619203	E	0	0	0	0	0	0	3B	0
29,820	Cultural Arts/ South Stadium District	0.68	46619501	0	INDUSTRIAL	0	0	0	0	0	3B	0
26,189	Cultural Arts/ South Stadium District	0.60	46614403T	0	PARKING	0	0	0	0	0	3B	0
14,994	Neighborhood General	0.34	46614203	U	PARKING	0	0	0	0	10,580	5B	2,750
6,988	Cultural Arts/ South Stadium District	0.16	46619206	E	0	0	0	0	0	0	3B	0
15,040	Neighborhood General	0.35	46611401	U	PARKING	0	0	0	0	10,613	5B	2,750
26,234	Cultural Arts/ South Stadium District	0.60	46614212	0	COMMERCIAL	0	0	0	0	0	3B	0
10,482	Cultural Arts/ South Stadium District	0.24	46619205	U	PARKING	0	902.33	1	902	20,832	3B	3,000
8,993	Neighborhood General	0.21	46614204	VACANT	RESIDENTIAL	0	0	0	0	6,346	5B	2,250
8,244	Cultural Arts/ South Stadium District	0.19	46619301	E	0	0	0	0	0	0	3B	0
14,991	Cultural Arts/ South Stadium District	0.34	46619507	0	INDUSTRIAL	0	0	0	0	0	3B	0
18,752	Neighborhood General	0.43	46611412	U	INDUSTRIAL	0	0	0	0	13,232	5B	3,000
6,996	Cultural Arts/ South Stadium District	0.16	46619204	U	PARKING	0	0	0	0	13,904	3B	2,500
9,739	Neighborhood General	0.22	46614214	VACANT	0	0	0	0	0	6,872	5B	2,250
22,459	Cultural Arts/ South Stadium District	0.52	46614406	EU	RETAIL	0	7661.61	1	7,662	44,633	3B	4,500
17,971	Cultural Arts/ South Stadium District	0.41	46619302	E	0	0	0	0	0	0	3B	0
14,970	Neighborhood General	0.34	46611411	U	PARKING	0	0	0	0	10,563	5B	2,750
18,685	Cultural Arts/ South Stadium District	0.43	46619502	0	COMMERCIAL	0	0	0	0	0	3B	0
14,979	Cultural Arts/ South Stadium District	0.34	46614209	0	INDUSTRIAL	0	0	0	0	0	3B	0
11,171	Neighborhood General	0.26	46614215	VACANT	0	0	0	0	0	7,883	5B	2,500
11,228	Cultural Arts/ South Stadium District	0.26	46619506	0	INDUSTRIAL	0	0	0	0	0	3B	0
36,236	Cultural Arts/ South Stadium District	0.83	46614501T	0	CIVIC	MUSEUM	0	0	0	0	3B	0
26,181	Neighborhood General	0.60	46611415	U	COMMERCIAL	0	23882.48	1	23,882	18,474	5B	3,750
18,748	Cultural Arts/ South Stadium District	0.43	46619320	U	PARKING	0	0	0	0	37,259	3B	4,000
44,753	Neighborhood General	1.03	46611414	U	COMMERCIAL	0	15348.78	2	30,698	31,579	5B	4,750
6,469	Cultural Arts/ South Stadium District	0.15	46619303	E	COMMERCIAL	0	0	0	0	0	3B	0
7,478	Cultural Arts/ South Stadium District	0.17	46619505	0	INDUSTRIAL	0	0	0	0	0	3B	0
11,284	Cultural Arts/ South Stadium District	0.26	46619503	E	0	0	0	0	0	0	3B	0
41,162	Neighborhood General	0.94	46611215T	0	CIVIC	FUSD	0	0	0	0	5B	0
7,487	Cultural Arts/ South Stadium District	0.17	46614208	0	RETAIL	0	0	0	0	0	3B	0
4,762	Cultural Arts/ South Stadium District	0.11	46619304	E	COMMERCIAL	0	0	0	0	0	3B	0
26,103	Cultural Arts/ South Stadium District	0.60	46619504	U	INDUSTRIAL	0	11213.67	1	11,214	51,877	3B	4,750
11,978	Cultural Arts/ South Stadium District	0.27	46619308	0	COMMERCIAL	0	0	0	0	0	3B	0
11,206	Cultural Arts/ South Stadium District	0.26	46614207	0	RETAIL	0	0	0	0	0	3B	0
18,726	Neighborhood General	0.43	46614301	0	CIVIC	CHURCH	0	0	0	0	5B	0
14,976	Cultural Arts/ South Stadium District	0.34	46614508T	VACANT	0	0	0	0	0	29,763	3B	3,750
12,694	Cultural Arts/ South Stadium District	0.29	46619310	0	RESIDENTIAL	0	0	0	0	0	3B	0
240,428	Proposed Open Space	5.52	46503012U	0	0	0	0	0	0	0	0	0
10,476	Cultural Arts/ South Stadium District	0.24	46619309	E	COMMERCIAL	0	0	0	0	0	3B	0
14,959	Cultural Arts/ South Stadium District	0.34	46619601	EU	0	0	3689.57	1	3,690	29,729	3B	3,750
24,440	Cultural Arts/ South Stadium District	0.56	46619306	U	RETAIL	0	5151.09	1	5,151	48,570	3B	4,750
13,171	Cultural Arts/ South Stadium District	0.30	46614502T	VACANT	OPEN SPACE	0	0	0	0	26,175	3B	3,500
7,484	Cultural Arts/ South Stadium District	0.17	46614507T	E	0	0	0	0	0	0	3B	0
7,494	Neighborhood General	0.17	46614302	U	PARKING	0	0	0	0	5,288	5B	2,000
11,225	Neighborhood General	0.26	46611501	EU	0	0	6014.14	1	6,014	7,920	5B	2,500
10,292	CBD 1	0.24	46614313	0	COMMERCIAL	0	0	0	0	0	1A	0
3,741	Cultural Arts/ South Stadium District	0.09	46614506T	EU	0	0	2583.37	1	2,583	0	3B	0
7,496	Neighborhood General	0.17	46614303	0	CIVIC	CHURCH	0	0	0	0	5B	0
14,969	Cultural Arts/ South Stadium District	0.34	46619602	VACANT	0	0	0	0	0	29,748	3B	3,750
14,960	Cultural Arts/ South Stadium District	0.34	46614505T	EU	0	0	9900.76	1	9,901	29,731	3B	3,750
10,487	Cultural Arts/ South Stadium District	0.24	46614503T	VACANT	PARKING	0	0	0	0	20,841	3B	3,000
11,227	Neighborhood General	0.26	46611502	0	RESIDENTIAL	0	0	0	0	0	5B	0
7,508	Neighborhood General	0.17	46611207	U	0	0	0	0	0	5,298	5B	2,000
22,473	Cultural Arts/ South Stadium District	0.52	46620115	0	CIVIC	CORNERSTONE	0	0	0	0	3B	0
49,669	CBD 1	1.14	46614315	U	COMMERCIAL	0	26559.96	2	53,120	302,495	1A	6,000
26,299	Neighborhood General	0.60	46614314	0	COMMERCIAL	0	0	0	0	0	5B	0
54,918	Cultural Arts/ South Stadium District	1.26	46619604	0	INDUSTRIAL	0	0	0	0	0	3B	0
11,261	Neighborhood General	0.26	46611206	U	COMMERCIAL	0	7516.49	1	7,516	7,946	5B	2,500
7,465	Neighborhood General	0.17	46611512	U	CIVIC	OFFICE	3176.56	1	3,177	5,268	5B	2,000
14,975	Neighborhood General	0.34	46611503	0	RESIDENTIAL	0	0	0	0	0	5B	0
29,924	Cultural Arts/ South Stadium District	0.69	46619603	0	RESIDENTIAL	0	0	0	0	0	3B	0
18,710	Cultural Arts/ South Stadium District	0.43	46614504	EU	0	0	19180.01	2	38,360	37,183	3B	4,000
52,105	Proposed Open Space	1.20	46503021U	0	INDUSTRIAL	0	0	0	0	0	0	0
7,468	Neighborhood General	0.17	46611511	U	PARKING	0	0	0	0	5,269	5B	2,000
37,408	CBD 1	0.86	46614615U	0	COMMERCIAL	0	0	0	0	0	1A	0
20,940	Cultural Arts/ South Stadium District	0.48	46620114	U	PARKING	0	0	0	0	41,615	3B	4,250
25,933	Cultural Arts/ South Stadium District	0.60	46620116	0	CIVIC	CORNERSTONE	0	0	0	0	3B	0
11,208	Neighborhood General	0.26	46611510	U	PARKING	0	0	0	0	7,909	5B	2,500
22,570	Neighborhood General	0.52	46611513T	0	PARKING	0	0	0	0	0	5B	0
22,441	CBD 2	0.52	46611307	U	COMMERCIAL	0	12182.66	2	24,365	53,544	1A	2,500

SHERWOOD Design Engineers

PARCEL INFO				EXISTING						PROPOSED		
AREA (sf)	ZONE	AREA (ac)	APN	BUILDING CONDITION	GROUND FLOOR USE	SUB_USE	FIRST FLOOR S.F.	BLDG STORIES	total bldg s.f.	Maximum Building Area (sf)	Construction Type	Fire Flow (gpm)
14,956	Neighborhood General	0.34	46611509	0	COMMERCIAL	0	0	0	0	0	5B	0
29,983	Neighborhood General	0.69	46615114	U	PARKING	0	0	0	0	21,157	5B	4,000
18,688	CBD 1	0.43	46614614	U	COMMERCIAL	0	6086.41	2	12,173	113,814	1A	3,750
6,984	Cultural Arts/ South Stadium District	0.16	46620108	U	PARKING	0	0	0	0	13,880	3B	2,500
4,988	Cultural Arts/ South Stadium District	0.11	46619605	0	INDUSTRIAL	0	0	0	0	0	3B	0
11,651	Cultural Arts/ South Stadium District	0.27	46620104	0	RETAIL	0	0	0	0	0	3B	0
18,813	Neighborhood General	0.43	46611515	U	PARKING	0	0	0	0	13,275	5B	3,000
6,986	Cultural Arts/ South Stadium District	0.16	46620107	U	PARKING	0	0	0	0	13,884	3B	2,500
12,000	CBD 2	0.28	46611306	U	COMMERCIAL	0	6323.36	1	6,323	28,631	1A	1,750
29,977	Cultural Arts/ South Stadium District	0.69	46620410	U	INDUSTRIAL	0	10860.27	1	10,860	59,575	3B	5,250
22,518	CBD 1	0.52	46614613	U	PARKING	0	0	0	0	137,141	1A	4,000
8,492	CBD 2	0.19	46611614T	0	0	0	0	0	0	0	1A	0
59,867	CBD 2	1.37	46611613T	0	CIVIC	DETENTION	0	0	0	0	1A	0
21,026	Cultural Arts/ South Stadium District	0.48	46620112	U	PARKING	0	0	0	0	41,786	3B	4,250
7,477	CBD 1	0.17	46614609	0	CIVIC	CHURCH	0	0	0	0	1A	0
10,785	CBD 1	0.25	46615114	0	CIVIC	OFFICE	0	0	0	0	1A	0
25,563	CBD 2	0.59	46611308	VACANT	0	0	0	0	0	60,992	1A	2,750
33,730	CBD 1	0.77	46614616	0	CIVIC	WARNORS THEAT	0	0	0	0	1A	0
7,491	Neighborhood General	0.17	46615103	U	PARKING	0	0	0	0	5,286	5B	2,000
20,625	CBD 1	0.47	46620201	0	CIVIC	CHURCH	0	0	0	0	1A	0
7,937	CBD 1	0.18	46615110	E	0	0	0	0	0	0	1A	0
37,479	Cultural Arts/ South Stadium District	0.86	46620407	0	INDUSTRIAL	0	0	0	0	0	3B	0
7,489	Neighborhood General	0.17	46615104	U	PARKING	0	0	0	0	5,284	5B	2,000
7,487	CBD 1	0.17	46615109	0	RETAIL	0	0	0	0	0	1A	0
59,815	CBD 2	1.37	46611613T	U	PARKING	0	0	0	0	142,718	1A	4,000
29,510	Cultural Arts/ South Stadium District	0.68	46620409	U	CIVIC	CORNERSTONE	18596.01	1	18,596	58,647	3B	5,250
127,656	Civic Center	2.93	46612101T	0	CIVIC	OFFICE	0	0	0	0	1A	0
15,064	Neighborhood General	0.35	46615105	U	COMMERCIAL	0	7562.77	1	7,563	10,630	5B	2,750
7,486	CBD 1	0.17	46615108	0	RETAIL	0	0	0	0	0	1A	0
7,495	CBD 1	0.17	46620202	0	CIVIC	CHURCH	0	0	0	0	1A	0
13,976	CBD 1	0.32	46620220	E	0	0	0	0	0	0	1A	0
6,737	CBD 1	0.15	46615107	0	COMMERCIAL	0	0	0	0	0	1A	0
255,106	0	5.86	46504034U	0	0	0	0	0	0	0	0	0
20,595	CBD 1	0.47	46620221	0	RETAIL	0	0	0	0	0	1A	0
19,541	CBD 1	0.45	46615106	0	RETAIL	0	0	0	0	0	1A	0
10,474	CBD 1	0.24	46620219	E	0	0	0	0	0	0	1A	0
11,225	CBD 2	0.26	46615201	0	COMMERCIAL	0	0	0	0	0	1A	0
14,953	Cultural Arts/ South Stadium District	0.34	46620406	0	INDUSTRIAL	0	0	0	0	0	3B	0
22,912	CBD 1	0.53	46615315	0	PARKING	0	0	0	0	0	1A	0
27,921	CBD 1	0.64	46615318	0	PARKING	0	0	0	0	0	1A	0
10,467	CBD 1	0.24	46620208	U	PARKING	0	0	0	0	63,748	1A	2,750
11,269	CBD 1	0.26	46620205	EI	0	0	0	0	0	0	1A	0
28,486	CBD 2	0.65	46615202	U	PARKING	0	0	0	0	67,968	1A	2,750
11,222	CBD 1	0.26	46620523	VACANT	0	0	0	0	0	68,347	1A	2,750
7,437	Cultural Arts/ South Stadium District	0.17	46620405	0	INDUSTRIAL	0	0	0	0	0	3B	0
10,460	CBD 1	0.24	46620207	0	RETAIL	0	0	0	0	0	1A	0
17,854	CBD 1	0.41	46615312	U	COMMERCIAL	0	17895.84	2	35,792	108,735	1A	3,500
26,172	CBD 1	0.60	46615211	0	RETAIL	0	0	0	0	0	1A	0
607,022	Civic Center	13.94	46616001T	0	CIVIC	OFFICE	0	0	0	0	1A	0
7,488	CBD 1	0.17	46620524	VACANT	0	0	0	0	0	45,602	1A	2,250
60,644	CBD 1	1.39	46620656T	U	CIVIC	OFFICE	12830.73	3	38,492	369,340	1A	6,000
10,468	CBD 1	0.24	46620206	U	PARKING	0	0	0	0	63,752	1A	2,750
14,977	CBD 1	0.34	46620503	VACANT	0	0	0	0	0	91,217	1A	3,250
85,119	District	1.95	46504023S	0	PARKING	0	0	0	0	0	3B	0
10,821	CBD 1	0.25	46620514	0	INDUSTRIAL	0	0	0	0	0	1A	0
23,915	CBD 1	0.55	46615314	U	RETAIL	0	23956.85	1	23,957	145,647	1A	4,000
20,179	CBD 2	0.46	46615203	0	COMMERCIAL	0	0	0	0	0	1A	0
26,224	Civic Center	0.60	46612201T	0	CIVIC	OFFICE	0	0	0	0	1A	0
7,473	CBD 1	0.17	46620513	0	INDUSTRIAL	0	0	0	0	0	1A	0
7,490	CBD 1	0.17	46620504	VACANT	0	0	0	0	0	45,614	1A	2,250
33,659	CBD 1	0.77	46615210	0	RETAIL	0	0	0	0	0	1A	0
35,180	CBD 1	0.81	46615419T	0	RETAIL	0	0	0	0	0	1A	0
19,852	CBD 1	0.46	46620512	0	RETAIL	0	0	0	0	0	1A	0
7,490	CBD 1	0.17	46620505	E	0	0	0	0	0	0	1A	0
57,293	CBD 1	1.32	46620650T	0	PARKING	0	0	0	0	0	1A	0
11,241	CBD 1	0.26	46620506	U	PARKING	0	0	0	0	68,463	1A	2,750
2,579	CBD 1	0.06	46620651T	0	0	0	0	0	0	0	1A	0
24,456	Civic Center	0.56	46612203	0	CIVIC	OFFICE	0	0	0	0	1A	0
66,752	Civic Center	1.53	46612202T	0	CIVIC	FUSD	0	0	0	0	1A	0
8,178	CBD 1	0.19	46620511	0	INDUSTRIAL	0	0	0	0	0	1A	0
4,391	CBD 1	0.10	46620637	0	0	0	0	0	0	0	1A	0
11,191	CBD 1	0.26	46615414	0	COMMERCIAL	0	0	0	0	0	1A	0

SHERWOOD Design Engineers

PARCEL INFO				EXISTING						PROPOSED		
AREA (sf)	ZONE	AREA (ac)	APN	BUILDING CONDITION	GROUND FLOOR USE	SUB_USE	FIRST FLOOR S.F.	BLDG STORIES	total bldg s.f.	Maximum Building Area (sf)	Construction Type	Fire Flow (gpm)
58,732	CBD 1	1.35	46620648	0	CIVIC	OFFICE	0	0	0	0	1A	0
12,679	CBD 1	0.29	46620518	0	INDUSTRIAL	0	0	0	0	0	1A	0
25,483	Special District	0.59	46504006	U	INDUSTRIAL	0	14225.26	1	14,225	27,323	3B	3,500
7,451	CBD 1	0.17	46615413	0	RETAIL	0	0	0	0	0	1A	0
11,602	CBD 1	0.27	46620638	0	0	0	0	0	0	0	1A	0
21,854	CBD 1	0.50	46615421	0	RETAIL	0	0	0	0	0	1A	0
18,582	CBD 1	0.43	46615412	0	RETAIL	0	0	0	0	0	1A	0
46,094	Special District	1.06	46508426	0	INDUSTRIAL	0	0	0	0	0	3B	0
8,135	0	0.19	46504031S	0	0	0	0	0	0	0	0	0
25,379	CBD 1	0.58	46620647	0	CIVIC	OFFICE	0	0	0	0	1A	0
18,327	CBD 1	0.42	46621112	0	CIVIC	OFFICE	0	0	0	0	1A	0
30,028	CBD 1	0.69	46620649	0	PARKING	0	0	0	0	0	1A	0
47,087	0	1.08	46504035U	0	0	0	0	0	0	0	0	0
11,971	0	0.27	46504005T	0	0	0	0	0	0	0	0	0
11,462	CBD 1	0.26	46615431	0	PARKING	0	0	0	0	0	1A	0
173,378	Special District	3.98	46508424	0	INDUSTRIAL	0	0	0	0	0	3B	0
57,263	0	1.31	46504036U	0	0	0	0	0	0	0	0	0
5,278	CBD 1	0.12	46621120	0	RETAIL	0	0	0	0	0	1A	0
33,734	CBD 2	0.77	46504004	0	RETAIL	0	0	0	0	0	1A	0
10,737	CBD 1	0.25	46615411	0	CIVIC	OFFICE	0	0	0	0	1A	0
20,969	CBD 1	0.48	46621113T	0	PARKING	0	0	0	0	0	1A	0
1,406	CBD 1	0.03	46625007U	0	RETAIL	0	0	0	0	0	1A	0
14,754	CBD 1	0.34	46621103T	0	CIVIC	OFFICE	0	0	0	0	1A	0
31,428	CBD 1	0.72	46625008T	0	CIVIC	FRESNO COUNTY	0	0	0	0	1A	0
29,716	CBD 1	0.68	46620654T	U	PARKING	0	0	0	0	180,980	1A	4,500
40,825	CBD 2	0.94	46821116	0	COMMERCIAL	0	0	0	0	0	1A	0
2,081	CBD 1	0.05	46621119T	0	0	0	0	0	0	0	1A	0
11,112	CBD 1	0.26	46621104T	0	CIVIC	OFFICE	0	0	0	0	1A	0
16,735	CBD 1	0.38	46626001	0	COMMERCIAL	0	0	0	0	0	1A	0
5,775	CBD 1	0.13	46621115T	0	0	0	0	0	0	0	1A	0
22,478	CBD 1	0.52	46621401	E	0	0	0	0	0	0	1A	0
3,258	CBD 1	0.07	46621105	0	RETAIL	0	0	0	0	0	1A	0
26,201	CBD 2	0.60	46504003	0	INDUSTRIAL	0	0	0	0	0	1A	0
29,325	CBD 1	0.67	46621117	0	RESIDENTIAL	0	0	0	0	0	1A	0
18,952	CBD 2	0.44	46509120	U	INDUSTRIAL	0	14373.55	1	14,374	45,219	1A	2,250
4,282	CBD 1	0.10	46621106	0	0	0	0	0	0	0	1A	0
13,367	CBD 1	0.31	46617114	0	RETAIL	0	0	0	0	0	1A	0
127,021	CBD 2	2.92	46821410T	0	CIVIC	OFFICE	0	0	0	0	1A	0
18,701	CBD 1	0.43	46625008T	0	CIVIC	FRESNO COUNTY	0	0	0	0	1A	0
1,908	CBD 1	0.04	46620629T	0	0	0	0	0	0	0	1A	0
25,305	CBD 2	0.58	46818520	U	PARKING	0	0	0	0	60,378	1A	2,750
29,755	CBD 2	0.68	46509135	0	RETAIL	0	0	0	0	0	1A	0
18,769	CBD 2	0.43	46509134	U	INDUSTRIAL	0	0	0	0	44,783	1A	2,250
1,829	CBD 1	0.04	46620631T	0	0	0	0	0	0	0	1A	0
18,758	CBD 2	0.43	46821115	0	RETAIL	0	0	0	0	0	1A	0
6,008	CBD 1	0.14	46617113	0	RETAIL	0	0	0	0	0	1A	0
7,504	CBD 1	0.17	46621201	0	CIVIC	OFFICE	0	0	0	0	1A	0
3,387	CBD 1	0.08	46621417T	0	0	0	0	0	0	0	1A	0
12,016	CBD 1	0.28	46617112	0	RETAIL	0	0	0	0	0	1A	0
96,009	CBD 2	2.20	46821219T	0	CIVIC	CONVENTION CTR	0	0	0	0	1A	0
7,496	CBD 1	0.17	46621217	0	RETAIL	0	0	0	0	0	1A	0
55,688	CBD 1	1.28	46621417T	0	PARKING	0	0	0	0	0	1A	0
25,253	CBD 2	0.58	46818518	U	PARKING	0	0	0	0	60,254	1A	2,750
7,495	CBD 1	0.17	46621216	0	CIVIC	OFFICE	0	0	0	0	1A	0
615	CBD 1	0.01	46621417T	0	0	0	0	0	0	0	1A	0
17,251	CBD 2	0.40	46509133	U	PARKING	0	0	0	0	41,160	1A	2,250
21,963	CBD 2	0.50	46504022S	0	INDUSTRIAL	0	0	0	0	0	1A	0
132,552	CBD 1	3.04	46703035ST	0	0	0	0	0	0	0	1A	0
12,007	CBD 1	0.28	46617111	0	RETAIL	0	0	0	0	0	1A	0
537	CBD 1	0.01	46621118T	0	0	0	0	0	0	0	1A	0
18,908	CBD 1	0.43	46624003	0	HOSPITALITY	0	0	0	0	0	1A	0
14,022	CBD 1	0.32	46621212	0	CIVIC	CREST THEATER	0	0	0	0	1A	0
14,987	CBD 1	0.34	46621203	0	RETAIL	0	0	0	0	0	1A	0
30,258	CBD 2	0.69	46509136	0	COMMERCIAL	0	0	0	0	0	1A	0
22,554	CBD 2	0.52	46509323	0	RETAIL	0	0	0	0	0	1A	0
633,183	CBD 2	14.54	46840001T	0	CIVIC	PRFM ARTS CTR	0	0	0	0	1A	0
231	CBD 2	0.01	46821449U	0	0	0	0	0	0	0	1A	0
231	CBD 2	0.01	46821442U	0	0	0	0	0	0	0	1A	0
51,021	CBD 1	1.17	46621220	0	PARKING	0	0	0	0	0	1A	0
12,510	CBD 1	0.29	46621204	0	RETAIL	0	0	0	0	0	1A	0
35,958	Special District	0.83	46513119	U	INDUSTRIAL	0	12350.3	1	12,350	38,555	3B	4,250
4,000	CBD 2	0.09	46509501T	0	0	0	0	0	0	0	1A	0

SHERWOOD Design Engineers

PARCEL INFO				EXISTING						PROPOSED		
AREA (sf)	ZONE	AREA (ac)	APN	BUILDING CONDITION	GROUND FLOOR USE	SUB_USE	FIRST FLOOR S.F.	BLDG STORIES	total bldg s.f.	Maximum Building Area (sf)	Construction Type	Fire Flow (gpm)
36,621	CBD 2	0.84	46504021S	0	INDUSTRIAL	0	0	0	0	0	1A	0
26,287	CBD 2	0.60	46825111	0	COMMERCIAL	0	0	0	0	0	1A	0
36,112	CBD 1	0.83	46624008	0	RETAIL	0	0	0	0	0	1A	0
17,639	CBD 1	0.40	46617212	0	HOSPITALITY	0	0	0	0	0	1A	0
16	0	0.00	46509317T	0	0	0	0	0	0	0	0	0
37,020	CBD 2	0.85	46509321	U	COMMERCIAL	0	5411.91	1	5,412	88,328	1A	3,250
33,814	CBD 2	0.78	46509327	U	COMMERCIAL	0	8483.35	1	8,483	80,680	1A	3,000
67,184	0	1.54	46703036U	0	0	0	0	0	0	0	0	0
9,997	CBD 1	0.23	46621213T	0	PARKING	0	0	0	0	0	1A	0
54,387	CBD 2	1.25	46509218	U	INDUSTRIAL	0	22202.43	1	22,202	129,768	1A	4,000
123,511	CBD 1	2.84	46621520T	0	PARKING	0	0	0	0	0	1A	0
231	CBD 2	0.01	46821428U	0	0	0	0	0	0	0	1A	0
32,056	CBD 2	0.74	46821220T	VACANT	0	0	0	0	0	76,486	1A	3,000
51,518	CBD 2	1.18	46821527	0	RETAIL	0	0	0	0	0	1A	0
11,269	CBD 1	0.26	46825110	0	COMMERCIAL	0	0	0	0	0	1A	0
32,425	0	0.74	46703013U	0	0	0	0	0	0	0	0	0
6,980	CBD 1	0.16	46627001	0	RETAIL	0	0	0	0	0	1A	0
1,752	CBD 1	0.04	46627X02	0	0	0	0	0	0	0	1A	0
14,140	CBD 2	0.32	46825112	0	COMMERCIAL	0	0	0	0	0	1A	0
6,758	CBD 1	0.16	46617215	0	RETAIL	0	0	0	0	0	1A	0
57,195	0	1.31	46703022U	0	0	0	0	0	0	0	0	0
231	CBD 2	0.01	46821435U	0	0	0	0	0	0	0	1A	0
21,476	CBD 2	0.49	46509221	U	COMMERCIAL	0	8034.18	1	8,034	51,242	1A	2,500
10,860	CBD 1	0.25	46621325T	0	0	0	0	0	0	0	1A	0
11,279	CBD 1	0.26	46825109	E	COMMERCIAL	0	0	0	0	0	1A	0
675	CBD 1	0.02	46627X01	0	0	0	0	0	0	0	1A	0
231	CBD 2	0.01	46821429U	0	0	0	0	0	0	0	1A	0
18,335	CBD 1	0.42	46617208	0	RETAIL	0	0	0	0	0	1A	0
64,835	CBD 2	1.49	46513219	U	RETAIL	0	26498.46	1	26,498	154,696	1A	4,250
8,406	CBD 2	0.19	46825113	0	PARKING	0	0	0	0	0	1A	0
43,372	CBD 2	1.00	46821528	0	PARKING	0	0	0	0	0	1A	0
3,444	CBD 1	0.08	46621324	0	RETAIL	0	0	0	0	0	1A	0
26,140	CBD 2	0.60	46509325	0	COMMERCIAL	0	0	0	0	0	1A	0
26,324	CBD 1	0.60	46825114	U	RETAIL	0	22986.18	1	22,986	160,323	1A	4,250
8,238	CBD 1	0.19	46621302	0	RETAIL	0	0	0	0	0	1A	0
11,288	CBD 2	0.26	46825104	0	RETAIL	0	0	0	0	0	1A	0
14,467	CBD 2	0.33	46703023S	0	INDUSTRIAL	0	7235.73	1	7,236	34,517	1A	2,000
37,725	CBD 2	0.87	46509215	0	RETAIL	0	0	0	0	0	1A	0
18,742	CBD 1	0.43	46825402	VACANT	0	0	0	0	0	114,145	1A	3,750
7,968	CBD 1	0.18	46617207	0	RESTAURANT	0	0	0	0	0	1A	0
7,491	CBD 1	0.17	46621303	0	RETAIL	0	0	0	0	0	1A	0
800	CBD 2	0.02	46513218T	U	UTILITY	0	0	0	0	1,909	1A	1,500
34,138	CBD 1	0.78	46621332	0	COMMERCIAL	0	0	0	0	0	1A	0
2,200	CBD 2	0.05	46513211T	U	UTILITY	0	0	0	0	5,249	1A	1,500
199	CBD 2	0.00	46513216T	U	0	0	0	0	0	476	1A	1,500
3,971	CBD 1	0.09	46621304	0	RETAIL	0	0	0	0	0	1A	0
127,340	CBD 2	2.92	46509436U	U	INDUSTRIAL	0	29407.16	1	29,407	303,832	1A	6,000
15,069	CBD 2	0.35	46703019S	0	INDUSTRIAL	0	8180.29	1	8,180	35,954	1A	2,000
19,030	CBD 2	0.44	46821530	0	PARKING	0	0	0	0	0	1A	0
3,729	CBD 1	0.09	46825401	VACANT	0	0	0	0	0	22,713	1A	1,750
132	0	0.00	46509326T	0	0	0	0	0	0	0	0	0
7,269	CBD 1	0.17	46621305	0	RETAIL	0	0	0	0	0	1A	0
11,302	CBD 1	0.26	46825105	0	COMMERCIAL	0	0	0	0	0	1A	0
18,827	CBD 2	0.43	46825211	U	PARKING	0	0	0	0	44,922	1A	2,250
3,748	CBD 1	0.09	46621306	0	RETAIL	0	0	0	0	0	1A	0
27,130	CBD 1	0.62	46825410	0	RETAIL	0	0	0	0	0	1A	0
15,336	CBD 1	0.35	46825403	EU	0	0	15317.62	1	15,318	93,400	1A	3,250
90,676	CBD 1	2.08	46621333	0	COMMERCIAL	0	0	0	0	0	1A	0
14,995	CBD 1	0.34	46621307	E	0	0	0	0	0	0	1A	0
29,590	CBD 2	0.68	46703025S	0	COMMERCIAL	0	0	0	0	0	1A	0
34,263	CBD 1	0.79	46621330T	0	PARKING	0	0	0	0	0	1A	0
11,242	CBD 2	0.26	46825202	0	RETAIL	0	0	0	0	0	1A	0
18,254	CBD 2	0.42	46706116	0	INDUSTRIAL	0	0	0	0	0	1A	0
14,249	CBD 2	0.33	46821529	0	PARKING	0	0	0	0	0	1A	0
7,180	CBD 1	0.16	46825413	U	COMMERCIAL	0	2548.82	1	2,549	43,728	1A	2,250
117,060	CBD 2	2.69	46821617T	0	PARKING	0	0	0	0	0	1A	0
15,069	CBD 1	0.35	46825210	0	PARKING	0	0	0	0	0	1A	0
3,753	CBD 1	0.09	46825405	0	RESTAURANT	0	0	0	0	0	1A	0
11,279	CBD 1	0.26	46825406	0	RESTAURANT	0	0	0	0	0	1A	0
30,056	CBD 2	0.69	46825204	U	HOSPITALITY	0	12201.5	2	24,403	71,714	1A	3,000
25,726	CBD 2	0.59	46706121	0	COMMERCIAL	0	0	0	0	0	1A	0
12,976	CBD 2	0.30	46706113	E	0	0	0	0	0	0	1A	0

SHERWOOD Design Engineers

PARCEL INFO				EXISTING						PROPOSED		
AREA (sf)	ZONE	AREA (ac)	APN	BUILDING CONDITION	GROUND FLOOR USE	SUB_USE	FIRST FLOOR S.F.	BLDG STORIES	total bldg s.f.	Maximum Building Area (sf)	Construction Type	Fire Flow (gpm)
60,284	CBD 1	1.38	46621334	U	PARKING	0	0	0	0	367,149	1A	6,000
6,662	CBD 1	0.15	46825409	0	RETAIL	0	0	0	0	0	1A	0
182,716	0	4.19	46703032U	0	0	0	0	0	0	0	0	0
24,797	CBD 1	0.57	46828101	E	0	0	0	0	0	0	1A	0
7,518	CBD 1	0.17	46825408	0	RETAIL	0	0	0	0	0	1A	0
11,298	CBD 1	0.26	46825209T	U	COMMERCIAL	0	11016.97	1	11,017	68,806	1A	2,750
67,823	CBD 2	1.56	46513312	U	INDUSTRIAL	0	38107.18	1	38,107	161,824	1A	4,250
2,290	0	0.05	46513313T	U	0	0	0	0	0	0	0	0
18,808	CBD 1	0.43	46825407	0	RETAIL	0	0	0	0	0	1A	0
19,846	CBD 2	0.46	46706115	0	RETAIL	0	0	0	0	0	1A	0
144,811	CBD 2	3.32	46706414	U	RETAIL	0	58231.38	1	58,231	345,518	1A	6,000
11,295	CBD 1	0.26	46825208T	EU	0	0	3591.86	1	3,592	68,787	1A	2,750
28,734	CBD 1	0.66	46825514	0	COMMERCIAL	0	0	0	0	0	1A	0
34,310	CBD 2	0.79	46706120	U	RETAIL	0	7269.35	1	7,269	81,863	1A	3,000
38,958	CBD 1	0.89	46703017	E	0	0	0	0	0	0	1A	0
7,648	CBD 1	0.18	46828441	0	RETAIL	0	0	0	0	0	1A	0
7,513	CBD 1	0.17	46828102	0	RETAIL	0	0	0	0	0	1A	0
6,026	CBD 1	0.14	46825207	E	0	0	0	0	0	0	1A	0
8,366	CBD 1	0.19	46828442	0	RETAIL	0	0	0	0	0	1A	0
5,266	CBD 1	0.12	46825206	E	0	0	0	0	0	0	1A	0
7,618	CBD 1	0.17	46828103	0	RETAIL	0	0	0	0	0	1A	0
11,300	CBD 1	0.26	46825205	E	0	0	0	0	0	0	1A	0
180,475	CBD 2	4.14	46822426	0	HOSPITALITY	0	0	0	0	0	1A	0
6,001	CBD 2	0.14	46825301	0	COMMERCIAL	0	0	0	0	0	1A	0
135,222	CBD 1	3.10	46828443T	0	CIVIC	0	0	0	0	0	1A	0
7,089	CBD 1	0.16	46828104	0	RETAIL	0	0	0	0	0	1A	0
30,099	CBD 1	0.69	46825507	0	RETAIL	0	0	0	0	0	1A	0
5,975	CBD 1	0.14	46825513	U	RESTAURANT	0	4848.18	1	4,848	36,391	1A	2,000
35,254	CBD 2	0.81	46825319	0	COMMERCIAL	0	0	0	0	0	1A	0
220,413	CBD 1	5.06	46828444T	0	CIVIC	CHUKCHANSI PAR	0	0	0	0	1A	0
11,596	CBD 1	0.27	46828105	0	RETAIL	0	0	0	0	0	1A	0
11,299	CBD 1	0.26	46706211	0	RESTAURANT	0	0	0	0	0	1A	0
25,276	CBD 1	0.58	46825511T	0	PARKING	0	0	0	0	0	1A	0
11,271	CBD 1	0.26	46706203	U	PARKING	0	0	0	0	68,641	1A	2,750
22,522	CBD 2	0.52	46825316	U	PARKING	0	0	0	0	53,736	1A	2,500
28,596	CBD 1	0.66	46703004	0	RETAIL	0	0	0	0	0	1A	0
26,653	CBD 2	0.61	46710112	0	COMMERCIAL	0	0	0	0	0	1A	0
22,594	Chinatown District	0.52	46706210	U	RETAIL	0	1103.64	1	1,104	31,934	3B	3,750
10,595	CBD 1	0.24	46828221T	0	RETAIL	0	0	0	0	0	1A	0
30,110	CBD 1	0.69	46825515T	0	RETAIL	0	0	0	0	0	1A	0
11,271	CBD 1	0.26	46706204U	0	0	0	0	0	0	0	1A	0
18,769	CBD 2	0.43	46825318	E	0	0	0	0	0	0	1A	0
15,714	CBD 1	0.36	46828219	E	0	0	0	0	0	0	1A	0
7,514	CBD 1	0.17	46706205	VACANT	0	0	0	0	0	45,763	1A	2,250
15,022	CBD 2	0.34	46825311T	U	PARKING	0	0	0	0	35,842	1A	2,000
38,288	CBD 2	0.88	46710113	U	COMMERCIAL	0	11034.21	1	11,034	91,355	1A	3,250
11,271	CBD 1	0.26	46706206	EU	0	0	7450.98	1	7,451	68,646	1A	2,750
30,026	CBD 2	0.69	46825601	0	RETAIL	0	0	0	0	0	1A	0
390,921	0	8.97	46704021U	0	0	0	0	0	0	0	0	0
26,328	Chinatown District	0.60	46706209	U	INDUSTRIAL	0	8124.75	1	8,125	37,212	3B	4,000
3,759	CBD 1	0.09	46828222T	E	RETAIL	0	0	0	0	0	1A	0
7,512	CBD 2	0.17	46825315T	U	PARKING	0	0	0	0	17,924	1A	1,500
7,520	Chinatown District	0.17	46706501	0	RETAIL	0	0	0	0	0	3B	0
8,898	CBD 2	0.20	46706415	U	RETAIL	0	0	0	0	21,231	1A	1,500
7,518	CBD 1	0.17	46706207	VACANT	0	0	0	0	0	45,787	1A	2,250
3,759	CBD 1	0.09	46828205	0	RETAIL	0	0	0	0	0	1A	0
21,560	CBD 2	0.49	46822218	U	INDUSTRIAL	0	11625.35	1	11,625	51,443	1A	2,500
26,308	CBD 1	0.60	46828223T	0	PARKING	0	0	0	0	0	1A	0
52,649	CBD 1	1.21	46704024S	0	CIVIC	FIRE DEPT	0	0	0	0	1A	0
15,028	CBD 2	0.34	46825309	E	0	0	0	0	0	0	1A	0
3,752	Chinatown District	0.09	46706510	0	RETAIL	0	0	0	0	0	3B	0
13,024	CBD 2	0.30	46822212T	0	RETAIL	0	0	0	0	0	1A	0
39,432	CBD 1	0.91	46703029S	0	PARKING	0	0	0	0	0	1A	0
59,990	CBD 2	1.38	46826118	U	RETAIL	0	12051.22	1	12,051	143,136	1A	4,000
7,504	Chinatown District	0.17	46706509	U	COMMERCIAL	0	2629.58	1	2,630	10,606	3B	2,250
11,263	Cultural Arts/ South Stadium District	0.26	46825610	U	RETAIL	0	5128.42	1	5,128	22,383	3B	3,250
11,287	Chinatown District	0.26	46706208	0	HOSPITALITY	0	0	0	0	0	3B	0
3,752	Chinatown District	0.09	46706503	0	RETAIL	0	0	0	0	0	3B	0
11,301	CBD 1	0.26	46706338	VACANT	0	0	0	0	0	68,825	1A	2,750
7,506	CBD 2	0.17	46825612	0	RETAIL	0	0	0	0	0	1A	0
60,115	Chinatown District	1.38	46706508T	U	CIVIC	FIRE DEPT	0	0	0	84,967	3B	6,250
16,813	CBD 2	0.39	46710111	0	RETAIL	0	0	0	0	0	1A	0

SHERWOOD Design Engineers

PARCEL INFO				EXISTING						PROPOSED		
AREA (sf)	ZONE	AREA (ac)	APN	BUILDING CONDITION	GROUND FLOOR USE	SUB_USE	FIRST FLOOR S.F.	BLDG STORIES	total bldg s.f.	Maximum Building Area (sf)	Construction Type	Fire Flow (gpm)
11,258	Chinatown District	0.26	46706511	E	0	0	0	0	0	0	3B	0
7,508	Cultural Arts/ South Stadium District	0.17	46825609	E	0	0	0	0	0	0	3B	0
7,506	CBD 2	0.17	46825611	0	RETAIL	0	0	0	0	0	1A	0
11,261	Cultural Arts/ South Stadium District	0.26	46825608	0	RETAIL	0	0	0	0	0	3B	0
3,757	CBD 1	0.09	46706303	VACANT	0	0	0	0	0	22,880	1A	1,750
11,288	CBD 2	0.26	46826114	0	RETAIL	ART GALLERY	0	0	0	0	1A	0
57,031	CBD 2	1.31	46822519	0	CIVIC	CHURCH	0	0	0	0	1A	0
7,506	Chinatown District	0.17	46706506	VACANT	0	0	0	0	0	10,609	3B	2,250
1,878	CBD 1	0.04	46706304	VACANT	0	0	0	0	0	11,440	1A	1,500
15,022	CBD 2	0.34	46825603	0	RETAIL	0	0	0	0	0	1A	0
11,945	CBD 1	0.27	46706344	VACANT	0	0	0	0	0	72,750	1A	3,000
7,525	CBD 2	0.17	46822209	U	INDUSTRIAL	0	4323.61	1	4,324	17,955	1A	1,500
117,099	CBD 1	2.69	46828445T	0	CIVIC	0	0	0	0	0	1A	0
18,775	Chinatown District	0.43	46706507	VACANT	0	0	0	0	0	26,536	3B	3,500
18,868	Chinatown District	0.43	46706334	U	PARKING	0	0	0	0	26,668	3B	3,500
30,078	Cultural Arts/ South Stadium District	0.69	46828314	EU	0	0	9601.44	1	9,601	59,777	3B	5,250
7,507	Cultural Arts/ South Stadium District	0.17	46825607	0	RETAIL	0	0	0	0	0	3B	0
7,523	CBD 2	0.17	46826116	E	RETAIL	ART GALLERY	0	0	0	0	1A	0
15,015	CBD 2	0.34	46822217	0	RETAIL	0	0	0	0	35,826	1A	2,000
4,958	CBD 1	0.11	46706339	VACANT	0	0	0	0	0	30,195	1A	1,750
7,506	Cultural Arts/ South Stadium District	0.17	46825606	U	PARKING	0	0	0	0	14,918	3B	2,500
7,523	CBD 2	0.17	46826117	VACANT	0	0	0	0	0	17,950	1A	1,500
22,534	Chinatown District	0.52	46710201	0	RETAIL	0	0	0	0	0	3B	0
3,756	CBD 1	0.09	46706311	VACANT	0	0	0	0	0	22,874	1A	1,750
43,669	CBD 2	1.00	46822520	U	RETAIL	0	13742.47	1	13,742	104,194	1A	3,500
7,506	Cultural Arts/ South Stadium District	0.17	46825605	E	0	0	0	0	0	0	3B	0
11,266	CBD 1	0.26	46706312	VACANT	0	0	0	0	0	68,615	1A	2,750
7,523	CBD 2	0.17	46826112	0	RESIDENTIAL	0	0	0	0	0	1A	0
3,763	Chinatown District	0.09	46706333	0	RESIDENTIAL	0	0	0	0	0	3B	0
60,225	Chinatown District	1.38	46704012S	0	INDUSTRIAL	0	0	0	0	0	3B	0
22,558	CBD 2	0.52	46826414	U	PARKING	0	0	0	0	53,824	1A	2,500
13,985	Cultural Arts/ South Stadium District	0.32	46828312	E	0	0	0	0	0	0	3B	0
1,881	Chinatown District	0.04	46706332	VACANT	0	0	0	0	0	2,659	3B	1,500
7,513	Cultural Arts/ South Stadium District	0.17	46825604	VACANT	0	0	0	0	0	14,930	3B	2,500
7,523	CBD 2	0.17	46826111	VACANT	0	0	0	0	0	17,949	1A	1,500
1,881	Chinatown District	0.04	46706331	E	0	0	0	0	0	0	3B	0
3,762	Chinatown District	0.09	46706330	VACANT	0	0	0	0	0	5,318	3B	1,500
6,158	CBD 1	0.14	46706335	VACANT	0	0	0	0	0	37,506	1A	2,000
191,242	Proposed Open Space	4.39	46704020ST	0	0	0	0	0	0	0	0	0
686	0	0.02	46828434T	0	CIVIC	0	0	0	0	0	0	0
26,285	CBD 2	0.60	46822320T	VACANT	0	0	0	0	0	62,716	1A	2,750
7,524	Chinatown District	0.17	46706329	VACANT	0	0	0	0	0	10,634	3B	2,250
9,414	Chinatown District	0.22	46706615	U	INDUSTRIAL	0	0	0	0	13,306	3B	2,500
7,526	Cultural Arts/ South Stadium District	0.17	46828303	EU	0	0	0	0	0	14,957	3B	2,500
18,767	CBD 2	0.43	46826110	U	RETAIL	0	3763.74	1	3,764	44,778	1A	2,250
3,520	CBD 1	0.08	46706337	0	RETAIL	0	0	0	0	0	1A	0
28,464	Proposed Open Space	0.65	46704022ST	0	0	0	0	0	0	0	0	0
15,023	Chinatown District	0.34	46710202	VACANT	0	0	0	0	0	21,234	3B	3,000
3,495	Cultural Arts/ South Stadium District	0.08	46828311	0	RETAIL	0	0	0	0	0	3B	0
1,225	Chinatown District	0.03	46706328	VACANT	0	0	0	0	0	1,731	3B	1,500
22,587	Cultural Arts/ South Stadium District	0.52	46828304	E	0	0	0	0	0	0	3B	0
1,881	Chinatown District	0.04	46706326	VACANT	0	0	0	0	0	2,658	3B	1,500
5,632	Chinatown District	0.13	46706613	U	INDUSTRIAL	0	2457.21	1	2,457	7,961	3B	2,000
3,494	Cultural Arts/ South Stadium District	0.08	46828310	0	RETAIL	0	0	0	0	0	3B	0
7,523	Chinatown District	0.17	46706325	VACANT	0	0	0	0	0	10,633	3B	2,250
1,584	CBD 1	0.04	46706318	VACANT	0	0	0	0	0	9,647	1A	1,500
31,030	Cultural Arts/ South Stadium District	0.71	46826412	E	INDUSTRIAL	0	0	0	0	0	3B	0
11,279	CBD 2	0.26	46826404	U	RETAIL	0	2354.86	1	2,355	26,912	1A	1,750
9,610	CBD 2	0.22	46826220	0	RETAIL	0	0	0	0	0	1A	0
17,465	Cultural Arts/ South Stadium District	0.40	46828315	0	RETAIL	0	0	0	0	0	3B	0
15,021	Chinatown District	0.34	46706602	U	INDUSTRIAL	0	3035.98	1	3,036	21,231	3B	3,000
22,558	Chinatown District	0.52	46710203	0	COMMERCIAL	0	0	0	0	0	3B	0
6,370	CBD 2	0.15	46826202	VACANT	0	0	0	0	0	15,199	1A	1,500
3,149	Chinatown District	0.07	46706319	VACANT	0	0	0	0	0	4,451	3B	1,500
7,533	Chinatown District	0.17	46707101	0	RETAIL	0	0	0	0	0	3B	0
656	Chinatown District	0.02	46706327	0	0	0	0	0	0	0	3B	0
7,020	Cultural Arts/ South Stadium District	0.16	46828601	VACANT	0	0	0	0	0	13,952	3B	2,500
11,279	Chinatown District	0.26	46706608	U	RETAIL	0	2520.16	1	2,520	15,942	3B	2,750
26,316	CBD 2	0.60	46826413S	U	RETAIL	0	1142.26	1	1,142	62,790	1A	2,750
6,500	CBD 2	0.15	46826203	E	0	0	0	0	0	0	1A	0
750	Chinatown District	0.02	46706320	VACANT	0	0	0	0	0	1,060	3B	1,500
1,879	Chinatown District	0.04	46707102	0	RETAIL	0	0	0	0	0	3B	0

SHERWOOD Design Engineers

PARCEL INFO				EXISTING						PROPOSED		
AREA (sf)	ZONE	AREA (ac)	APN	BUILDING CONDITION	GROUND FLOOR USE	SUB_USE	FIRST FLOOR S.F.	BLDG STORIES	total bldg s.f.	Maximum Building Area (sf)	Construction Type	Fire Flow (gpm)
11,557	CBD 2	0.27	46822521	U	PARKING	0	0	0	0	27,576	1A	1,750
1,499	Chinatown District	0.03	46706321	VACANT	0	0	0	0	0	2,119	3B	1,500
5,882	Chinatown District	0.14	46706336	U	RETAIL	0	6051.98	1	6,052	8,313	3B	2,000
9,394	Chinatown District	0.22	46707103T	0	PARKING	0	0	0	0	0	3B	0
14,955	CBD 2	0.34	46822624	U	PARKING	0	0	0	0	35,682	1A	2,000
7,511	Chinatown District	0.17	46706603	0	RETAIL	0	0	0	0	0	3B	0
8,031	Cultural Arts/ South Stadium District	0.18	46828611	E	0	0	0	0	0	0	3B	0
6,982	Cultural Arts/ South Stadium District	0.16	46828307	0	RETAIL	0	0	0	0	0	3B	0
11,274	Chinatown District	0.26	46706607	0	RETAIL	0	0	0	0	0	3B	0
18,851	CBD 2	0.43	46826215	U	PARKING	0	0	0	0	44,977	1A	2,250
10,890	CBD 2	0.25	46826217	0	INDUSTRIAL	0	0	0	0	0	1A	0
7,523	Cultural Arts/ South Stadium District	0.17	46828603	E	0	0	0	0	0	0	3B	0
7,511	Chinatown District	0.17	46706604	VACANT	0	0	0	0	0	10,617	3B	2,250
3,758	Chinatown District	0.09	46707104T	U	PARKING	0	0	0	0	5,311	3B	1,500
10,463	Cultural Arts/ South Stadium District	0.24	46828313	U	RETAIL	0	3806.46	1	3,806	20,794	3B	3,000
4,377	Chinatown District	0.10	46707117	E	0	0	0	0	0	0	3B	0
26,328	Cultural Arts/ South Stadium District	0.60	46829113T	E	RETAIL	0	0	0	0	0	3B	0
3,758	Chinatown District	0.09	46707105T	U	PARKING	0	0	0	0	5,312	3B	1,500
10,188	Cultural Arts/ South Stadium District	0.23	46826411	E	PARKING	0	0	0	0	0	3B	0
11,221	Cultural Arts/ South Stadium District	0.26	46828612	VACANT	0	0	0	0	0	22,300	3B	3,250
7,672	Cultural Arts/ South Stadium District	0.18	46828604	0	RETAIL	0	0	0	0	0	3B	0
37,593	Chinatown District	0.86	46706606	E	RETAIL	0	0	0	0	0	3B	0
7,512	Chinatown District	0.17	46706612	U	RETAIL	0	4408.18	1	4,408	10,617	3B	2,250
21,938	Chinatown District	0.50	46707116	E	0	0	0	0	0	0	3B	0
11,275	Chinatown District	0.26	46707106	U	PARKING	0	0	0	0	15,936	3B	2,750
14,519	CBD 2	0.33	46826218	0	INDUSTRIAL	0	0	0	0	0	1A	0
18,904	CBD 2	0.43	46822623	0	INDUSTRIAL	0	0	0	0	0	1A	0
11,131	Cultural Arts/ South Stadium District	0.26	46828605T	0	RETAIL	0	0	0	0	0	3B	0
15,025	Chinatown District	0.34	46710301	0	CIVIC	CHURCH	0	0	0	0	3B	0
7,487	Cultural Arts/ South Stadium District	0.17	46826410	U	RETAIL	0	0	0	0	14,880	3B	2,500
7,246	CBD 2	0.17	46826214	0	INDUSTRIAL	0	0	0	0	0	1A	0
7,512	Chinatown District	0.17	46706611	VACANT	0	0	0	0	0	10,617	3B	2,250
7,479	Cultural Arts/ South Stadium District	0.17	46828610	E	0	0	0	0	0	0	3B	0
22,549	Chinatown District	0.52	46707118	U	RETAIL	0	11744.86	1	11,745	31,871	3B	3,750
3,003	Cultural Arts/ South Stadium District	0.07	46826408	U	RETAIL	0	0	0	0	5,968	3B	1,750
14,492	CBD 2	0.33	46826216	0	INDUSTRIAL	0	0	0	0	0	1A	0
18,737	Chinatown District	0.43	46704007	VACANT	0	0	0	0	0	26,483	3B	3,500
7,243	CBD 2	0.17	46826209	VACANT	0	0	0	0	0	17,281	1A	1,500
7,478	Cultural Arts/ South Stadium District	0.17	46828609	E	0	0	0	0	0	0	3B	0
18,798	Cultural Arts/ South Stadium District	0.43	46828606	EU	0	0	2389.19	1	2,389	37,358	3B	4,000
20,906	Cultural Arts/ South Stadium District	0.48	46829111	U	RETAIL	0	7055.18	1	7,055	41,547	3B	4,250
26,077	CBD 2	0.60	46826518	U	RETAIL	0	3444.8	1	3,445	62,220	1A	2,750
8,216	Cultural Arts/ South Stadium District	0.19	46826409	U	RETAIL	0	2718.86	1	2,719	16,328	3B	2,750
7,513	Chinatown District	0.17	46710302	EU	0	0	2832.25	1	2,832	10,619	3B	2,250
7,516	Chinatown District	0.17	46707115	E	0	0	0	0	0	0	3B	0
11,277	Cultural Arts/ South Stadium District	0.26	46829115	U	PARKING	0	0	0	0	22,411	3B	3,250
26,162	Cultural Arts/ South Stadium District	0.60	46828608	0	INDUSTRIAL	0	0	0	0	0	3B	0
3,995	Chinatown District	0.09	46707401	EI	RETAIL	0	0	0	0	0	3B	0
23,743	Proposed Open Space	0.55	46704023ST	0	INDUSTRIAL	0	0	0	0	0	0	0
7,514	Chinatown District	0.17	46710303	E	0	0	0	0	0	0	3B	0
5,466	Chinatown District	0.13	46707113	0	RETAIL	0	0	0	0	0	3B	0
14,475	CBD 2	0.33	46826219	0	INDUSTRIAL	0	0	0	0	0	1A	0
20,471	CBD 2	0.47	46826307	0	RETAIL	0	0	0	0	0	1A	0
14,278	Chinatown District	0.33	46707402	EI	0	0	0	0	0	0	3B	0
22,566	Cultural Arts/ South Stadium District	0.52	46829116	U	RETAIL	0	3466.63	1	3,467	44,847	3B	4,500
22,351	Chinatown District	0.51	46704006	0	INDUSTRIAL	0	0	0	0	0	3B	0
3,508	Chinatown District	0.08	46707413	EI	0	0	0	0	0	0	3B	0
11,271	Chinatown District	0.26	46710304	0	RETAIL	0	0	0	0	0	3B	0
4,165	Chinatown District	0.10	46707112	0	RETAIL	0	0	0	0	0	3B	0
47,825	Cultural Arts/ South Stadium District	1.10	46826519	U	RETAIL	0	9531.64	1	9,532	95,045	3B	6,500
3,483	Cultural Arts/ South Stadium District	0.08	46829110	VACANT	0	0	0	0	0	6,922	3B	1,750
2,050	Chinatown District	0.05	46707114	0	RETAIL	0	0	0	0	0	3B	0
10,449	Cultural Arts/ South Stadium District	0.24	46829109	0	INDUSTRIAL	0	0	0	0	0	3B	0
11,267	Chinatown District	0.26	46707110	U	RETAIL	0	11067.55	1	11,068	15,925	3B	2,750
7,567	Chinatown District	0.17	46707201	0	RETAIL	0	0	0	0	0	3B	0
5,362	CBD 2	0.12	46826505	0	RESIDENTIAL	0	0	0	0	0	1A	0
4,509	Chinatown District	0.10	46707403	0	RETAIL	0	0	0	0	0	3B	0
9,017	Chinatown District	0.21	46710305	VACANT	0	0	0	0	0	12,745	3B	2,500
3,350	Chinatown District	0.08	46707111	0	RETAIL	0	0	0	0	0	3B	0
15,098	Cultural Arts/ South Stadium District	0.35	46829401	0	INDUSTRIAL	0	0	0	0	0	3B	0
15,007	Chinatown District	0.34	46707412	VACANT	0	0	0	0	0	21,211	3B	3,000
7,476	Cultural Arts/ South Stadium District	0.17	46828607	VACANT	0	0	0	0	0	14,858	3B	2,500

SHERWOOD Design Engineers

PARCEL INFO				EXISTING						PROPOSED		
AREA (sf)	ZONE	AREA (ac)	APN	BUILDING CONDITION	GROUND FLOOR USE	SUB_USE	FIRST FLOOR S.F.	BLDG STORIES	total bldg s.f.	Maximum Building Area (sf)	Construction Type	Fire Flow (gpm)
5,512	CBD 2	0.13	46826506	0	RESIDENTIAL	0	0	0	0	0	1A	0
7,514	Chinatown District	0.17	46707404	0	RETAIL	0	0	0	0	0	3B	0
52,627	Chinatown District	1.21	46707202	VACANT	0	0	0	0	0	74,384	3B	5,750
10,447	Cultural Arts/ South Stadium District	0.24	46829108	0	INDUSTRIAL	0	0	0	0	0	3B	0
9,768	Chinatown District	0.22	46710306	VACANT	0	0	0	0	0	13,806	3B	2,500
30,547	Chinatown District	0.70	46704005S	0	0	0	0	0	0	0	3B	0
7,249	CBD 2	0.17	46826507	VACANT	0	0	0	0	0	17,296	1A	1,500
7,514	Chinatown District	0.17	46707405T	U	PARKING	0	0	0	0	10,620	3B	2,250
15,640	CBD 2	0.36	46826305	0	PARKING	0	0	0	0	0	1A	0
7,547	Cultural Arts/ South Stadium District	0.17	46829402	0	RETAIL	0	0	0	0	0	3B	0
7,520	Chinatown District	0.17	46707411	VACANT	0	0	0	0	0	10,629	3B	2,250
10,875	CBD 2	0.25	46826508	E	0	0	0	0	0	0	1A	0
10,403	Cultural Arts/ South Stadium District	0.24	46829107	U	RETAIL	0	3957.88	1	3,958	20,674	3B	3,000
7,513	Chinatown District	0.17	46707406T	U	PARKING	0	0	0	0	10,619	3B	2,250
15,062	Chinatown District	0.35	46707208	0	RETAIL	0	0	0	0	0	3B	0
59,749	Cultural Arts/ South Stadium District	1.37	46829406	0	CIVIC	SKATING RINK	0	0	0	0	3B	0
15,091	Cultural Arts/ South Stadium District	0.35	46829403	E	0	0	0	0	0	0	3B	0
15,042	Chinatown District	0.35	46707410T	E	PARKING	0	0	0	0	0	3B	0
40,916	Cultural Arts/ South Stadium District	0.94	46829208	U	RETAIL	0	20056.78	1	20,057	57,831	3B	5,000
11,271	Chinatown District	0.26	46707407	0	RETAIL	0	0	0	0	0	3B	0
45,097	Chinatown District	1.04	46711114	0	RETAIL	0	0	0	0	0	3B	0
7,513	Chinatown District	0.17	46707207	EU	0	0	7678.26	1	7,678	10,618	3B	2,250
7,544	Cultural Arts/ South Stadium District	0.17	46829404	E	0	0	0	0	0	0	3B	0
7,522	Chinatown District	0.17	46707409	0	INDUSTRIAL	0	0	0	0	0	3B	0
7,247	Cultural Arts/ South Stadium District	0.17	46826509	0	INDUSTRIAL	0	0	0	0	0	3B	0
7,514	Chinatown District	0.17	46707206	E	0	0	0	0	0	10,620	3B	2,250
19,459	CBD 2	0.45	46826616	0	RETAIL	0	0	0	0	0	1A	0
32,454	Cultural Arts/ South Stadium District	0.75	46829207	U	RETAIL	0	6015.39	1	6,015	64,497	3B	5,250
15,083	Cultural Arts/ South Stadium District	0.35	46829405	U	RETAIL	0	1462.81	1	1,463	29,976	3B	3,750
15,048	Chinatown District	0.35	46707408	0	RETAIL	0	0	0	0	0	3B	0
9,997	0	0.23	46704018S	0	0	0	0	0	0	0	0	0
7,815	Chinatown District	0.18	46707205	EI	0	0	0	0	0	11,046	3B	2,250
11,133	Chinatown District	0.26	46707501	0	RETAIL	0	0	0	0	0	3B	0
40,158	Proposed Open Space	0.92	46705021S	VACANT	0	0	0	0	0	0	0	0
15,999	Chinatown District	0.37	46711111	0	0	0	0	0	0	0	3B	0
7,215	Chinatown District	0.17	46707210	EI	0	0	0	0	0	10,197	3B	2,250
7,426	Chinatown District	0.17	46707502	0	RETAIL	0	0	0	0	0	3B	0
13,491	CBD 2	0.31	46826629	0	0	0	0	0	0	0	1A	0
15,027	Chinatown District	0.34	46707203	EU	INDUSTRIAL	0	3241.55	1	3,242	21,240	3B	3,000
5,987	Cultural Arts/ South Stadium District	0.14	46826613	0	INDUSTRIAL	0	0	0	0	0	3B	0
14,624	Cultural Arts/ South Stadium District	0.34	46829204	VACANT	0	0	0	0	0	29,064	3B	3,500
7,428	Chinatown District	0.17	46707503	U	PARKING	0	0	0	0	10,499	3B	2,250
18,973	Chinatown Industrial District	0.44	46707301	0	RETAIL	0	0	0	0	0	3B	0
22,093	Cultural Arts/ South Stadium District	0.51	46826629	0	INDUSTRIAL	0	0	0	0	0	3B	0
5,037	Chinatown District	0.12	46707512	U	PARKING	0	0	0	0	7,119	3B	1,750
38,284	Cultural Arts/ South Stadium District	0.88	46829501	U	RETAIL	0	19722.94	1	19,723	76,085	3B	5,750
15,069	Chinatown District	0.35	46711113	0	RESTAURANT	0	0	0	0	0	3B	0
7,431	Chinatown District	0.17	46707504	0	RETAIL	0	0	0	0	0	3B	0
59,991	Cultural Arts/ South Stadium District	1.38	46705019S	U	RETAIL	0	17837.47	1	17,837	0	3B	0
24,993	Chinatown District	0.57	46707513	U	CIVIC	CHURCH	16416.2	1	16,416	35,325	3B	4,000
3,531	Cultural Arts/ South Stadium District	0.08	46829206	0	INDUSTRIAL	0	0	0	0	0	3B	0
17,655	Cultural Arts/ South Stadium District	0.41	46829205	VACANT	0	0	0	0	0	35,086	3B	4,000
7,433	Chinatown District	0.17	46707505	U	PARKING	0	0	0	0	10,506	3B	2,250
14,671	0	0.34	46704004	0	INDUSTRIAL	0	0	0	0	0	0	0
140,282	0	3.22	46705024U	0	0	0	0	0	0	0	0	0
7,526	Chinatown Industrial District	0.17	46707302	E	0	0	0	0	0	0	3B	0
18,617	Chinatown District	0.43	46707506	U	PARKING	0	0	0	0	26,313	3B	3,500
33,908	Chinatown Industrial District	0.78	46707317	EU	0	0	9590.56	1	9,591	51,039	3B	4,750
8,244	Cultural Arts/ South Stadium District	0.19	46829301	VACANT	0	0	0	0	0	16,383	3B	2,750
7,524	Chinatown Industrial District	0.17	46707303	E	0	0	0	0	0	0	3B	0
27,015	Cultural Arts/ South Stadium District	0.62	46829506	E	0	0	0	0	0	0	3B	0
14,949	Chinatown District	0.34	46707509	0	RESIDENTIAL	0	0	0	0	0	3B	0
92,379	Chinatown District	2.12	46711701	E	CIVIC	CHURCH	0	0	0	0	3B	0
3,188	Cultural Arts/ South Stadium District	0.07	46829319	VACANT	0	0	0	0	0	6,336	3B	1,750
3,762	Chinatown Industrial District	0.09	46707304	E	0	0	0	0	0	0	3B	0
3,761	Chinatown Industrial District	0.09	46707305	E	0	0	0	0	0	0	3B	0
7,522	Chinatown Industrial District	0.17	46707306T	VACANT	0	0	0	0	0	11,322	3B	2,250
7,514	Cultural Arts/ South Stadium District	0.17	46829507	VACANT	INDUSTRIAL	0	0	0	0	14,932	3B	2,500
3,734	Chinatown District	0.09	46707508	E	0	0	0	0	0	0	3B	0
2,618	Cultural Arts/ South Stadium District	0.06	46829312	U	INDUSTRIAL	0	848.47	1	848	5,202	3B	1,500
11,282	Chinatown Industrial District	0.26	46707307T	VACANT	0	0	0	0	0	16,982	3B	2,750
11,162	Chinatown District	0.26	46707507	U	PARKING	0	0	0	0	0	3B	0

SHERWOOD Design Engineers

PARCEL INFO				EXISTING						PROPOSED		
AREA (sf)	ZONE	AREA (ac)	APN	BUILDING CONDITION	GROUND FLOOR USE	SUB_USE	FIRST FLOOR S.F.	BLDG STORIES	total bldg s.f.	Maximum Building Area (sf)	Construction Type	Fire Flow (gpm)
11,271	Cultural Arts/ South Stadium District	0.26	46829503	VACANT	INDUSTRIAL	0	0	0	0	22,399	3B	3,250
141,020	Chinatown Industrial District	3.24	46707615	0	INDUSTRIAL	0	0	0	0	0	3B	0
63,774	Cultural Arts/ South Stadium District	1.46	46705013S	0	RETAIL	0	0	0	0	0	3B	0
30,060	Cultural Arts/ South Stadium District	0.69	46829505	0	INDUSTRIAL	0	0	0	0	0	3B	0
26,251	Chinatown Industrial District	0.60	46707316T	VACANT	0	0	0	0	0	39,514	3B	4,250
4,632	Cultural Arts/ South Stadium District	0.11	46829317	0	0	0	0	0	0	0	3B	0
19,309	Cultural Arts/ South Stadium District	0.44	46829309	0	INDUSTRIAL	0	0	0	0	0	3B	0
14,936	Chinatown Industrial District	0.34	46708116T	VACANT	0	0	0	0	0	22,482	3B	3,250
8,180	Cultural Arts/ South Stadium District	0.19	46829601	0	RETAIL	0	0	0	0	0	3B	0
181,134	0	4.16	46705024U	0	0	0	0	0	0	0	0	0
7,439	Cultural Arts/ South Stadium District	0.17	46829602	0	RETAIL	0	0	0	0	0	3B	0
29,894	Chinatown Industrial District	0.69	46708118	E	INDUSTRIAL	0	0	0	0	0	3B	0
5,264	Cultural Arts/ South Stadium District	0.12	46829308	0	RETAIL	0	0	0	0	0	3B	0
22,327	Cultural Arts/ South Stadium District	0.51	46829611	E	0	0	0	0	0	0	3B	0
2,907	Chinatown Industrial District	0.07	46708115	0	RESIDENTIAL	0	0	0	0	0	3B	0
7,022	Cultural Arts/ South Stadium District	0.16	46829307	0	RETAIL	0	0	0	0	0	3B	0
75,097	Proposed Open Space	1.72	46705017S	0	INDUSTRIAL	0	0	0	0	0	0	0
7,066	Chinatown Industrial District	0.16	46711703	0	0	0	0	0	0	0	3B	0
42,159	Cultural Arts/ South Stadium District	0.97	46829610	0	INDUSTRIAL	0	0	0	0	0	3B	0
8,612	Chinatown Industrial District	0.20	46708114	E	COMMERCIAL	0	0	0	0	0	3B	0
70,019	Chinatown Industrial District	1.61	46711702	0	INDUSTRIAL	0	0	0	0	0	3B	0
5,633	Chinatown Industrial District	0.13	46708113	0	RESIDENTIAL	0	0	0	0	0	3B	0
5,635	Chinatown Industrial District	0.13	46708112	0	RESIDENTIAL	0	0	0	0	0	3B	0
143,371	Chinatown Industrial District	3.29	46705023S	0	0	0	0	0	0	0	3B	0
5,584	Cultural Arts/ South Stadium District	0.13	46829606	0	INDUSTRIAL	0	0	0	0	0	3B	0
7,516	Chinatown Industrial District	0.17	46708111	0	RESIDENTIAL	0	0	0	0	0	3B	0
15,018	Chinatown Industrial District	0.34	46708119	0	RETAIL	0	0	0	0	0	3B	0
141,559	Chinatown Industrial District	3.25	46708422	0	INDUSTRIAL	0	0	0	0	0	3B	0
5,584	Cultural Arts/ South Stadium District	0.13	46829607	0	RETAIL	0	0	0	0	0	3B	0
7,519	Chinatown Industrial District	0.17	46708110	0	RESTAURANT	0	0	0	0	0	3B	0
7,447	Cultural Arts/ South Stadium District	0.17	46829608	E	0	0	0	0	0	0	3B	0
8,726	Chinatown Industrial District	0.20	46708109	0	RESTAURANT	0	0	0	0	0	3B	0
2,776	Chinatown Industrial District	0.06	46708105	E	0	0	0	0	0	0	3B	0
14,955	Cultural Arts/ South Stadium District	0.34	46829609	E	0	0	0	0	0	0	3B	0
26,461	Chinatown Industrial District	0.61	46708201	0	COMMERCIAL	0	0	0	0	0	3B	0
2,772	Chinatown Industrial District	0.06	46708106	0	RESIDENTIAL	0	0	0	0	0	3B	0
131,247	Proposed Open Space	3.01	46705052ST	VACANT	0	0	0	0	0	0	0	0
6,982	Chinatown Industrial District	0.16	46708108	U	RESIDENTIAL	0	3851.2	1	3,851	10,509	3B	2,250
1,364	Chinatown Industrial District	0.03	46708107	VACANT	0	0	0	0	0	2,053	3B	1,500
13,165	Chinatown Industrial District	0.30	46708212	VACANT	0	0	0	0	0	19,817	3B	3,000
33,650	Chinatown Industrial District	0.77	46708220	U	PARKING	0	0	0	0	50,650	3B	4,750
10,737	Cultural Arts/ South Stadium District	0.25	46830504	VACANT	0	0	0	0	0	21,339	3B	3,000
3,000	Chinatown Industrial District	0.07	46712101	0	COMMERCIAL	0	0	0	0	0	3B	0
5,641	Chinatown Industrial District	0.13	46708208	VACANT	0	0	0	0	0	8,491	3B	2,000
6,179	Chinatown Industrial District	0.14	46712111	0	UTILITY	0	0	0	0	0	3B	0
3,701	Chinatown Industrial District	0.08	46712118	0	PARKING	0	0	0	0	0	3B	0
22,554	Chinatown Industrial District	0.52	46708211	EU	0	0	3131	1	3,131	33,949	3B	4,000
5,657	Chinatown Industrial District	0.13	46712115	VACANT	0	0	0	0	0	8,515	3B	2,000
2,848	Chinatown Industrial District	0.07	46708501	VACANT	0	0	0	0	0	4,286	3B	1,500
5,135	Chinatown Industrial District	0.12	46712113	VACANT	0	0	0	0	0	7,729	3B	1,750
5,628	Chinatown Industrial District	0.13	46708502	0	RESIDENTIAL	0	0	0	0	0	3B	0
2,793	Chinatown Industrial District	0.06	46708517T	VACANT	0	0	0	0	0	4,204	3B	1,500
6,723	Chinatown Industrial District	0.15	46712112	VACANT	0	0	0	0	0	10,120	3B	2,250
7,515	Chinatown Industrial District	0.17	46708204	0	CIVIC	COMM GARDEN	0	0	0	0	3B	0
7,503	Chinatown Industrial District	0.17	46708503	0	RESIDENTIAL	0	0	0	0	0	3B	0
63,754	0	1.46	46705050U	0	0	0	0	0	0	0	0	0
11,269	Chinatown Industrial District	0.26	46708203	0	CIVIC	COMM GARDEN	0	0	0	0	3B	0
7,502	Chinatown Industrial District	0.17	46708504	VACANT	0	0	0	0	0	11,293	3B	2,250
48,959	Chinatown Industrial District	1.12	46708316	0	CIVIC	SOCIAL SERVICE	0	0	0	0	3B	0
8,675	Chinatown Industrial District	0.20	46712117	VACANT	0	0	0	0	0	13,058	3B	2,500
15,241	Chinatown Industrial District	0.35	46708516	VACANT	0	0	0	0	0	22,941	3B	3,250
7,502	Chinatown Industrial District	0.17	46708505	0	RESIDENTIAL	0	0	0	0	0	3B	0
7,351	Chinatown Industrial District	0.17	46708506	0	RESIDENTIAL	0	0	0	0	0	3B	0
7,514	Chinatown Industrial District	0.17	46708515	VACANT	0	0	0	0	0	11,310	3B	2,250
3,900	Chinatown Industrial District	0.09	46708507	0	RESIDENTIAL	0	0	0	0	0	3B	0
96,587	Chinatown Industrial District	2.22	46702017	0	CIVIC	RESCUE MISSION	0	0	0	0	3B	0
74,650	Chinatown Industrial District	1.71	46708334	0	0	0	0	0	0	0	3B	0
7,515	Chinatown Industrial District	0.17	46708514	0	RESIDENTIAL	0	0	0	0	0	3B	0
7,500	Chinatown Industrial District	0.17	46708508	0	INDUSTRIAL	0	0	0	0	0	3B	0
420	0	0.01	46702039U	0	0	0	0	0	0	0	0	0
6,764	Chinatown Industrial District	0.16	46708513	0	RESIDENTIAL	0	0	0	0	0	3B	0
7,596	Chinatown Industrial District	0.17	46708509	0	INDUSTRIAL	0	0	0	0	0	3B	0

SHERWOOD Design Engineers

PARCEL INFO				EXISTING						PROPOSED		
AREA (sf)	ZONE	AREA (ac)	APN	BUILDING CONDITION	GROUND FLOOR USE	SUB_USE	FIRST FLOOR S.F.	BLDG STORIES	total bldg s.f.	Maximum Building Area (sf)	Construction Type	Fire Flow (gpm)
6,389	Chinatown Industrial District	0.15	46708512	0	RESIDENTIAL	0	0	0	0	0	3B	0
9,021	Chinatown Industrial District	0.21	46708511	0	RESIDENTIAL	0	0	0	0	0	3B	0
5,651	Chinatown Industrial District	0.13	46708303	0	CIVIC	SOCIAL SERVICE	0	0	0	0	3B	0
7,535	Chinatown Industrial District	0.17	46708327T	U	0	0	0	0	0	0	3B	0
8,183	Chinatown Industrial District	0.19	46708510	0	RESIDENTIAL	0	0	0	0	0	3B	0
5,654	Chinatown Industrial District	0.13	46708304	0	CIVIC	SOCIAL SERVICE	0	0	0	0	3B	0
7,530	Chinatown Industrial District	0.17	46708326	0	0	0	0	0	0	0	3B	0
24,066	Chinatown Industrial District	0.55	46708335	0	0	0	0	0	0	0	3B	0
138,138	Chinatown Industrial District	3.17	46709234	0	CIVIC	RESCUE MISSION	0	0	0	0	3B	0
33,233	Chinatown Industrial District	0.76	46708333T	VACANT	0	0	0	0	0	50,022	3B	4,750
10,009	Chinatown Industrial District	0.23	46708331	0	0	0	0	0	0	0	3B	0
17,693	Chinatown Industrial District	0.41	46702018	0	CIVIC	RESCUE MISSION	0	0	0	0	3B	0
9,872	Chinatown Industrial District	0.23	46708330	0	0	0	0	0	0	0	3B	0
13,809	Chinatown Industrial District	0.32	46708329	0	0	0	0	0	0	0	3B	0
230,365	CBD 1	5.29	46504033ST	0	0	0	0	0	0	1,402,986	1A	6,250
48,531	CBD 1	1.11	46703034U	0	0	0	0	0	0	295,569	1A	5,750
125,367	CBD 1	2.88	46703031ST	0	COMMERCIAL	0	46701	1	46,701	763,521	1A	6,000
61,286	CBD 1	1.41	46703003S	0	TRANSPORTATION	GREYHOUND	24915	1	24,915	373,248	1A	6,000
57,985	CBD 1	1.33	46704025ST	0	0	0	0	0	0	353,145	1A	6,000

ATTACHMENT 3

Recommended Pipeline Improvements

Recommended Pipeline Improvements

Street Name	Cross Street 1	Cross Street 2	New or Replacement	Length, feet	Diameter, inches
Amador Street	Fulton/Van Ness All*	I/Van Ness Alley	Replace	399	8
Amador Street	H Street	Broadway/Fulton Alley	Replace	390	8
Amador Street	H Street	Broadway/Fulton Alley	New	190	8
Calaveras Street	H Street	Broadway/Fulton Alley	Replace	390	8
Calaveras Street	H Street	Broadway/Fulton Alley	New	261	8
E Street	Mono Street	Ventura Street	New	487	8
Fulton Street	Divisadero Street	Sacramento Street	New	309	8
H Street	H Street	Ventura Street	New	424	8
H Street	San Joaquin Street	Amador Street	New	444	8
Inyo Street	China Alley	G Street	New	177	8
Inyo Street	Hwy 99	Fagan Alley	New	397	8
M Street	Tulare Street	Fresno Street	New	1,007	8
Mariposa Street	Fagan Alley	G Street	New	625	8
Mariposa Street	Hwy 99	E Street	New	299	8
Mono Street	Fagan Alley	G Street	New	596	8
Sacramento Street	Broadway/H Alley	Broadway Street	New	218	8
San Joaquin Street	H Street	Broadway/Fulton Alley	Replace	225	8
San Joaquin Street	H Street	Broadway/Fulton Alley	New	390	8
San Joaquin Street	I/Van Ness Alley	I/M Alley	New	394	8
Santa Clara Street	Broadway/H Alley	Broadway/Fulton Alley	New	411	8
Tulare Street	Hwy 99	E Street	New	1,029	8
			Total	9,063	

Appendix 7: Sewer System Model Report

City of Fresno

Department Of Public Utilities

Utilities Planning and Engineering

Sewer Capacity Study

Of

Fulton Corridor Specific Plan Project Area

July 2011

City of
FRESNO

Department of Public Utilities

Administration Division
2600 Fresno Street, Room 3065
Fresno, California 93721-3624
559-621-8600 – FAX 559-498-1304
www.fresno.gov

Providing Life's Essential Services

July 15, 2011

Michael Amodeo
Project Manager
Sherwood Design Engineers

Subject: Fulton Corridor Specific Plan Sewer Capacity Study – Bounded by E. Divisadero Street and HWY 41 between "N" Street and 99 HWY

Dear Mr. Amodeo:

The Department of Public Utilities Planning and Engineering Section (UP&E) has completed the Sewer Capacity review of the Fulton Corridor Specific Plan project area and its impacts on the City of Fresno Sanitary Sewer System. The wastewater demands within the Fulton Corridor were based on the projected building areas and maximum Floor Area Ratios (max FARs) as developed by Moule & Polyzoides and the planning team. UP&E staff analyzed and modeled the updated wastewater flows provided by Sherwood Design Engineers by using GIS sewer facility data, associated Trunk Sewer Service Basins, and the 2025 General Plan Sewer Model data.

The Fulton Corridor Specific Plan falls within six Trunk Sewer Service Areas. These areas are identified as Walnut 9, North Central 7, North Central 8, South Central 2, North Central 10, and South Central 3. By using the provided wastewater data from Sherwood Design Engineers, staff has identified issues based on sewer capacity. Four of the six Trunk Sewer Service Areas have sewer mains identified with insufficient pipe capacity based on the wastewater flow data provided. (See attached Exhibit "A"). Also, included within Exhibit "A" are the recommended pipe size upgrades that shall support the projected wastewater flows from the Fulton Corridor Specific Plan area.

Recommendations

Exhibit "A" identifies the sewer mains impacted by the projected wastewater flows provided by Sherwood Design Engineers. Specific sewer mains where identified which were deemed insufficient to accept the added wastewater flows from the Fulton Corridor. The upgraded pipe diameters listed in Exhibit "A" shall be able to accommodate the increased sewer capacity flows generated by the Fulton Corridor Specific Plan. Capacity, age, and condition of the existing sewer facilities within the Fulton Corridor Specific Plan area shall be considered in order to determine upgrades, replacement, and rehabilitation.

Sincerely,

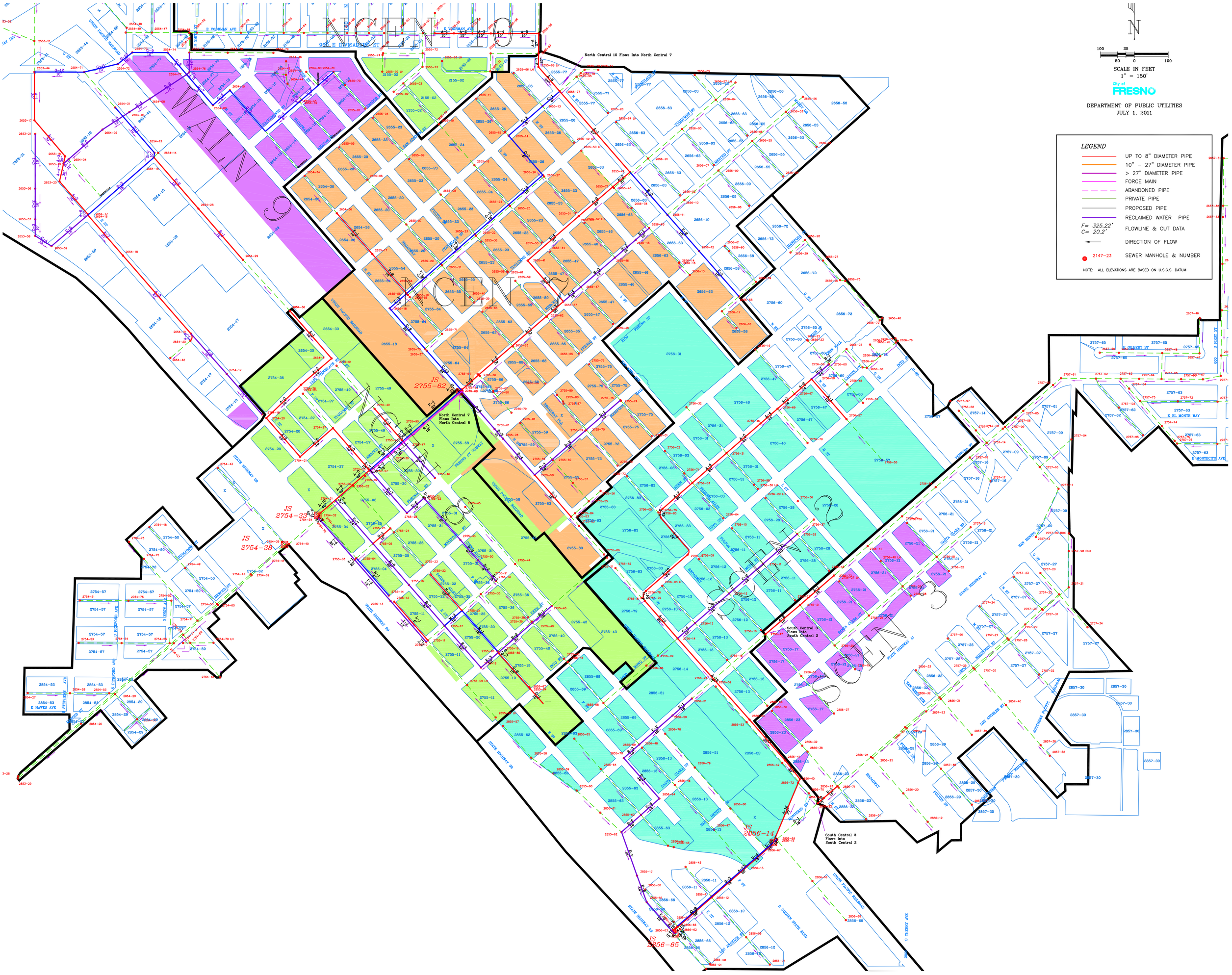
Doug Hecker
Supervising Engineering Technician

cc: Patrick N. Wiemiller, Director
Robert Andersen, Assistant Director (Department of Public Utilities)
Steve Hogg, Assistant Director (Wastewater)
Doug Hecker, Supervising Engineering Technician (Sewer)

Exhibit "A"

FULTON CORRIDOR PIPE SEGMENTS OVER CAPACITY

PIPE SEGMENT UP-STREAM NODE	PIPE SEGMENT DOWN-STREAM NODE	LENGTH (FEET)	PIPE DIAM. (IN)	PIPE SLOPE (FT/FT)	PROJECTED AVERAGE DAILY FLOW (MGD)	RUNNING FLOW TOTAL	DESIGN PEAK FLOW CAPACITY (MGD)	DESIGN MIN. PEAK FACTOR	MAX. DESIGN AVG. FLOW DEPTH (d/D)	DESIGN AVERAGE FLOW CAPACITY (MGD)	ADJUSTED DESIGN AVERAGE FLOW CAPACITY (MGD)	Upgraded Pipe Diameter Sizes	Standard Design Slope
SUB-SERVICE BASIN WALNUT 9													
PIPE RUN G:													
2654-43	2654-32	24.00	8	0.0008	0.0268	0.0693	0.2208	3.00	0.45	0.0736	0.0589	10	0.0024
2654-32	2654-11	399.23	8	0.0006	0.0347	0.1040	0.1912	3.00	0.45	0.0637	0.0510	10	0.0024
2654-11	2654-10	479.89	8	0.0016	0.0553	0.1593	0.3123	3.00	0.45	0.1041	0.0833	10	0.0024
2654-10	2654-09	199.60	8	0.0042	0.0112	0.1705	0.5060	3.00	0.45	0.1687	0.1350	10	0.0024
2654-09	2554-77	402.00	8	0.0014	0.0071	0.1776	0.2921	3.00	0.45	0.0974	0.0779	10	0.0024
2554-77	2554-74	220.00	8	0.0018	0.0164	0.1940	0.3312	3.00	0.45	0.1104	0.0883	10	0.0024
NORTH CENTRAL 7													
PIPE RUN A:													
2555-77	2655-42	947.46	27	0.0008	2.8675	2.8675	5.6596	1.80	0.59	3.1442	2.5154	30	0.0010
NORTH CENTRAL 8													
PIPE RUN A:													
2754-27	2755-26	486.00	10	0.0024	0.1336	0.1336	0.6935	2.5	0.49	0.2774	0.2219	12	0.0020
2755-26	SN27550004	13.00	10	0.0008	0.0000	0.1336	0.4004	2.5	0.49	0.1602	0.1282	12	0.0020
PIPE RUN D:													
2755-50	2755-33	239.90	8	0.0016	0.0549	0.0549	0.3123	3.0	0.45	0.1041	0.0833	10	0.0024
2755-33	2755-32	476.92	8	0.0023	0.0812	0.1361	0.3744	3.0	0.45	0.1248	0.0998	10	0.0024
2755-32	2755-31	13.00	8	0.0038	0.0000	0.1361	0.4813	3.0	0.45	0.1604	0.1283	10	0.0024
2755-27	SN27550004	13.00	10	0.0008	0.0000	0.1361	0.4004	2.5	0.49	0.1602	0.1282	12	0.0020
NORTH CENTRAL 10													
PIPE RUN A:													
2555-56	2555-58	253.13	15	0.0001	0.0157	0.0157	0.4174	2.00	0.56	0.2087	0.1670	18	0.0011
2555-58	2555-67	176.93	27	0.0007	2.6424	2.6581	5.2940	1.80	0.59	2.9411	2.3529	30	0.0010
2555-67	2555-68	118.71	27	0.0008	0.0248	2.6829	5.6596	1.80	0.59	3.1442	2.5154	30	0.0010
2555-68	2555-77	277.15	27	0.0008	0.0000	2.6829	5.6596	1.80	0.59	3.1442	2.5154	30	0.0010
	Total	**4,739.92**											


N
100 25
50 0 100
SCALE IN FEET
1" = 150'
City of FRESNO
DEPARTMENT OF PUBLIC UTILITIES
JULY 1, 2011
LEGEND
UP TO 8" DIAMETER PIPE
10" – 27" DIAMETER PIPE
> 27" DIAMETER PIPE
FORCE MAIN
ABANDONED PIPE
PRIVATE PIPE
PROPOSED PIPE
RECLAIMED WATER PIPE
F= 325.22'
C= 20.2'
FLOWLINE & CUT DATA
DIRECTION OF FLOW
2147-23
SEWER MANHOLE & NUMBER
NOTE: ALL ELEVATIONS ARE BASED ON U.S.G.S. DATUM
NORTH CENTRAL 10
NORTH CENTRAL 9
NORTH CENTRAL 7
NORTH CENTRAL 8
SOUTH CENTRAL 2
SOUTH CENTRAL 3
North Central 10 Flows Into North Central 7
North Central 7 Flows Into North Central 8
South Central 3 Flows Into South Central 2
JS 2755-62
JS 2754-33
JS 2754-38
JS 2856-14
JS 2856-65
E VOORMAN AVE
900 E DWIGHT WAY
E HAWES AVE
E GILBERT ST
E EL MONTE WAY
E MONTECITO AVE
STATE HIGHWAY 99
STATE HIGHWAY 41
UNION PACIFIC RAILROAD
SOUTHERN PACIFIC RAILROAD
FRESNO ST
FRESNO ST SUBWAY
BROADWAY PLZ
BROADWAY
FULTON ST
MARIPOSA
MONTEREY ST
SANTA CLARA ST
SAN JOSE ST
SAN BENITO
LOS ANGELES ST
S GOLDEN STATE BLVD
S CHERRY AVE
S PIGPOND AVE
S UNION AVE
S FIRST ST
S STEPHENS AVE

Fulton Corridor Sewer Basin Dependencies

North Central 10 Flows into North Central 7:

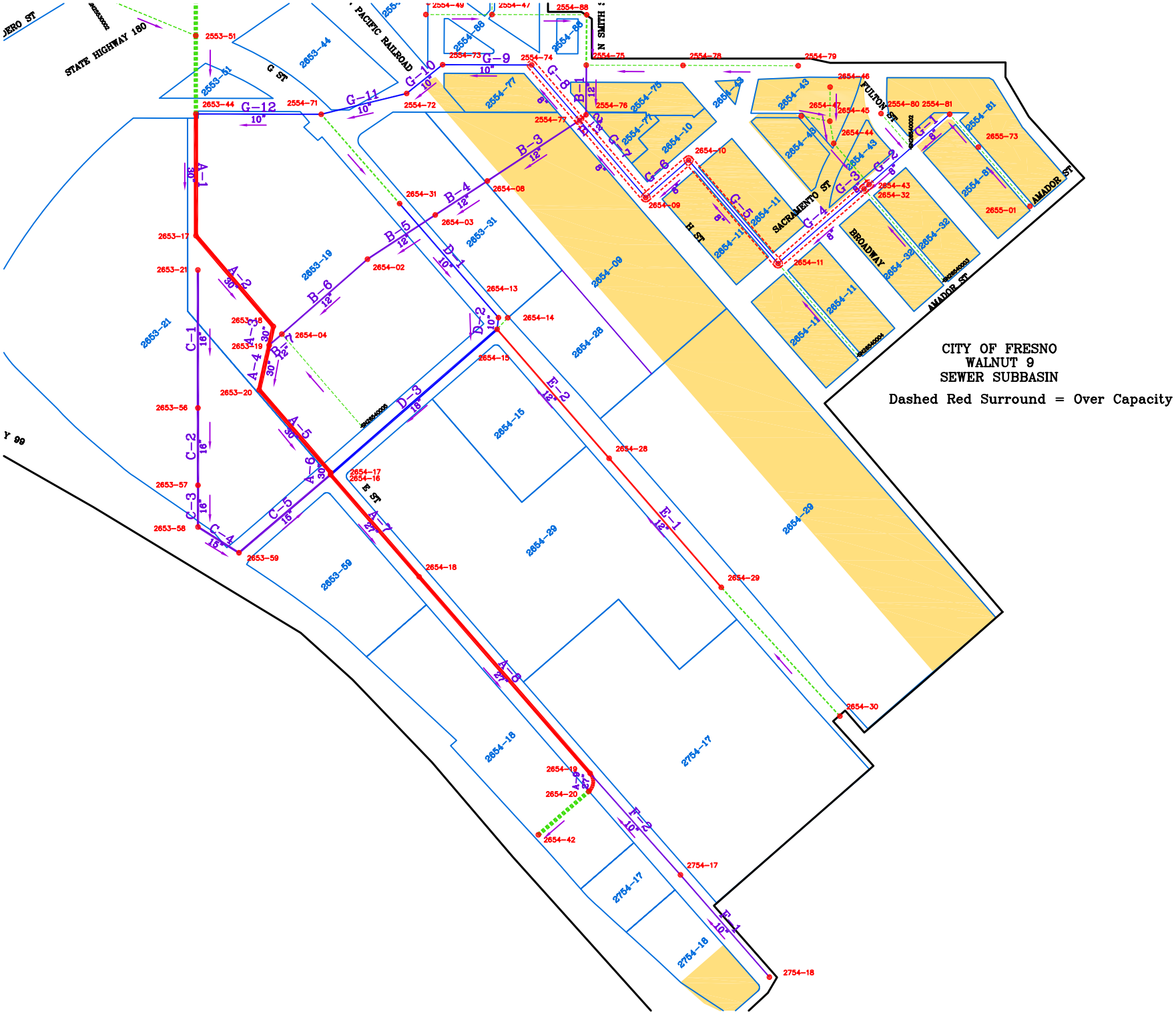
1) At Manhole 2555-77

North Central 7 Flows into North Central 8

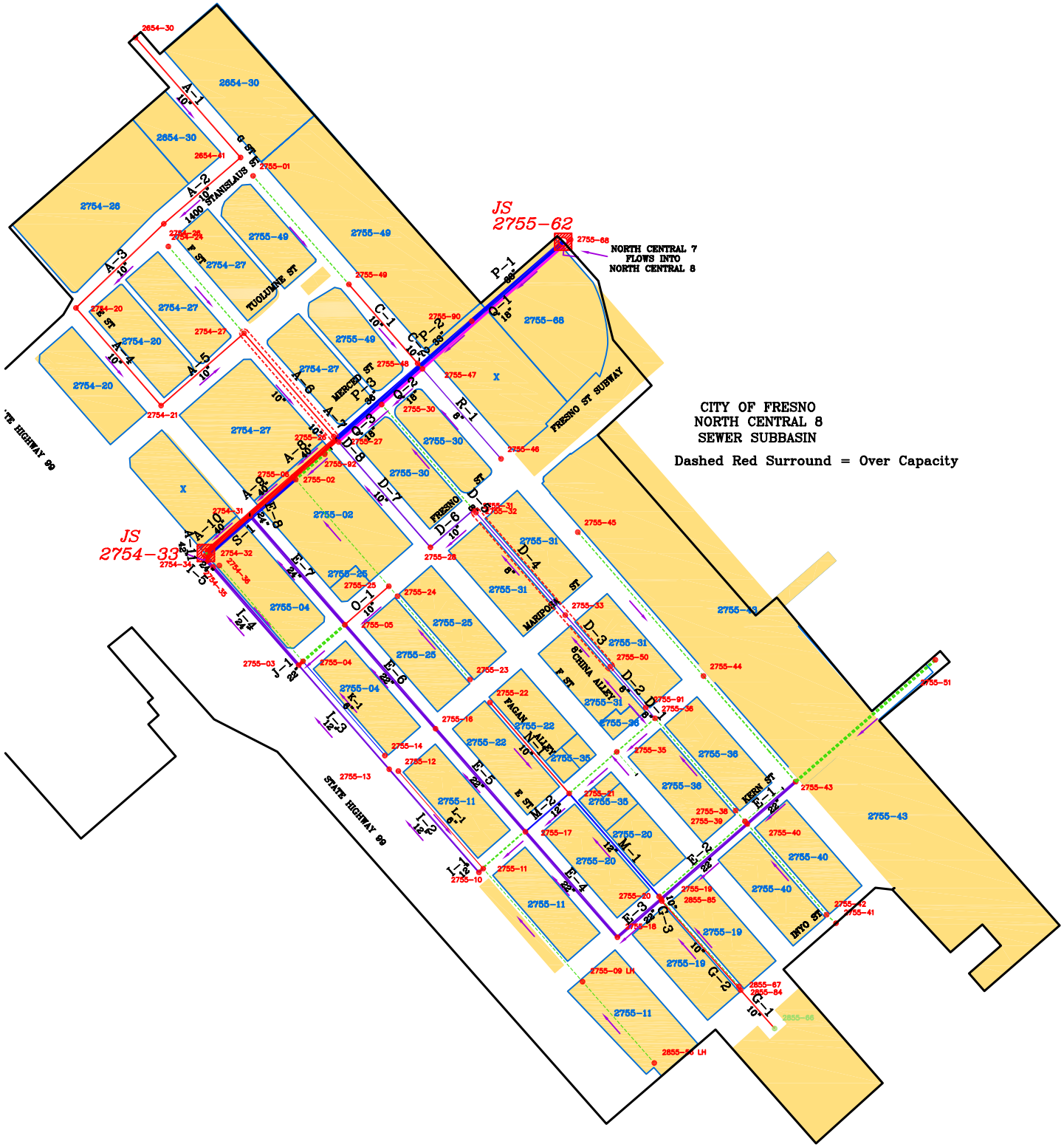
1) At Manhole 2755-62

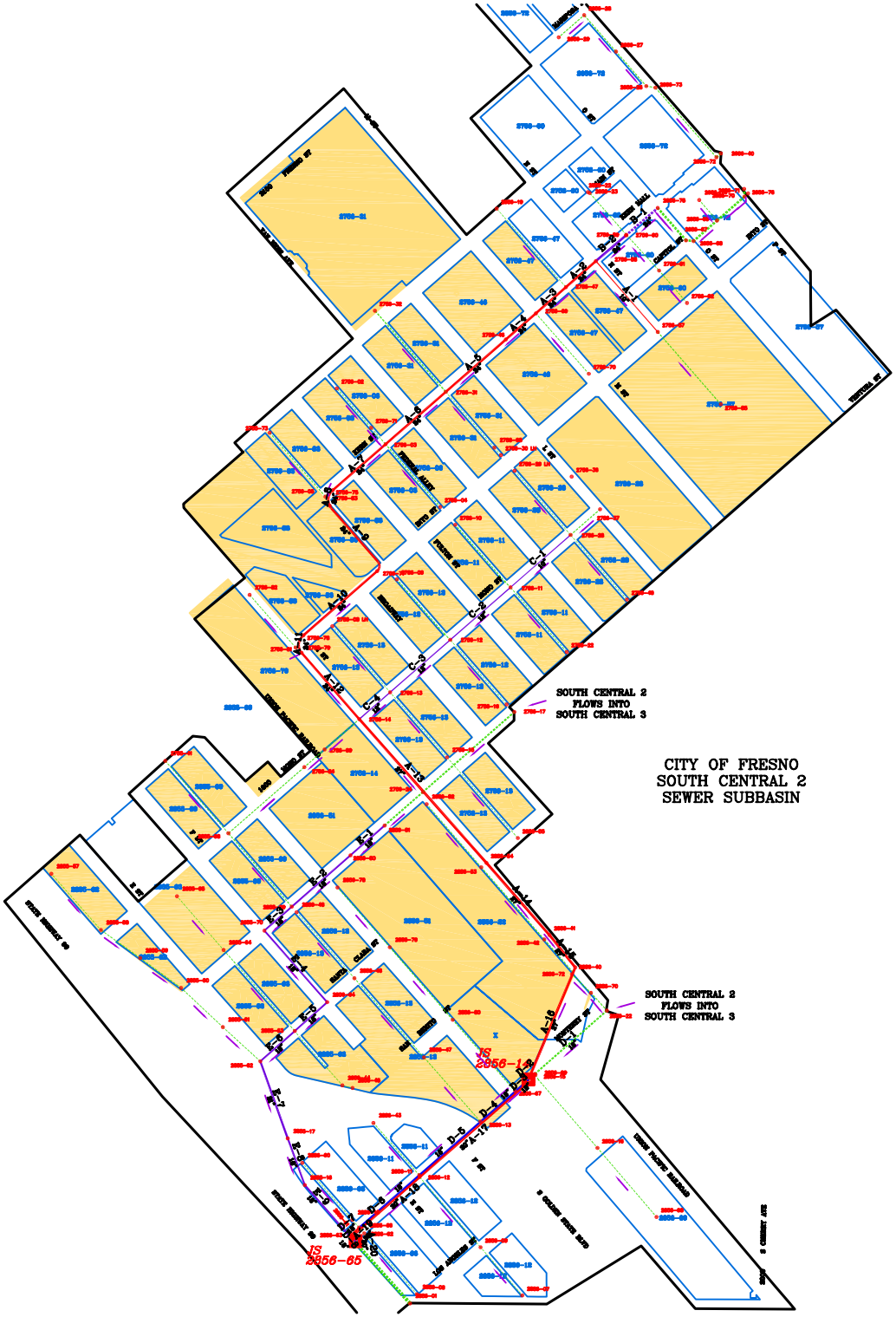
South Central 3 Flows into South Central 2 at 2 locations:

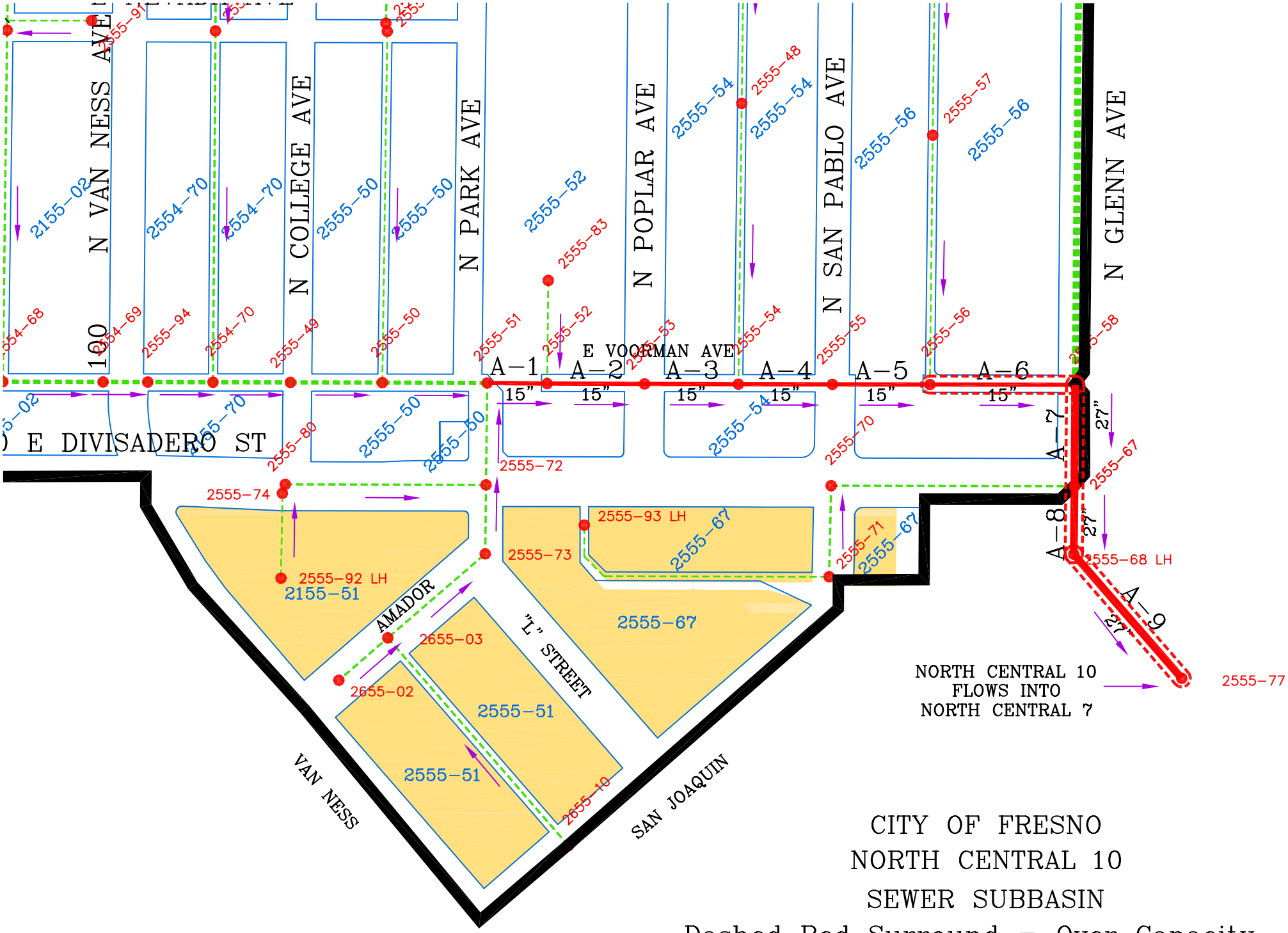
1) At Manhole 2856-22
2) At Manhole 2856-51


CITY OF FRESNO
WALNUT 9
SEWER SUBBASIN
Dashed Red Surround = Over Capacity
STATE HIGHWAY 180
G ST
PACIFIC RAILROAD
N SMITH
FULTON ST
SACRAMENTO ST
H ST
BROADWAY
AMADOR ST
E ST

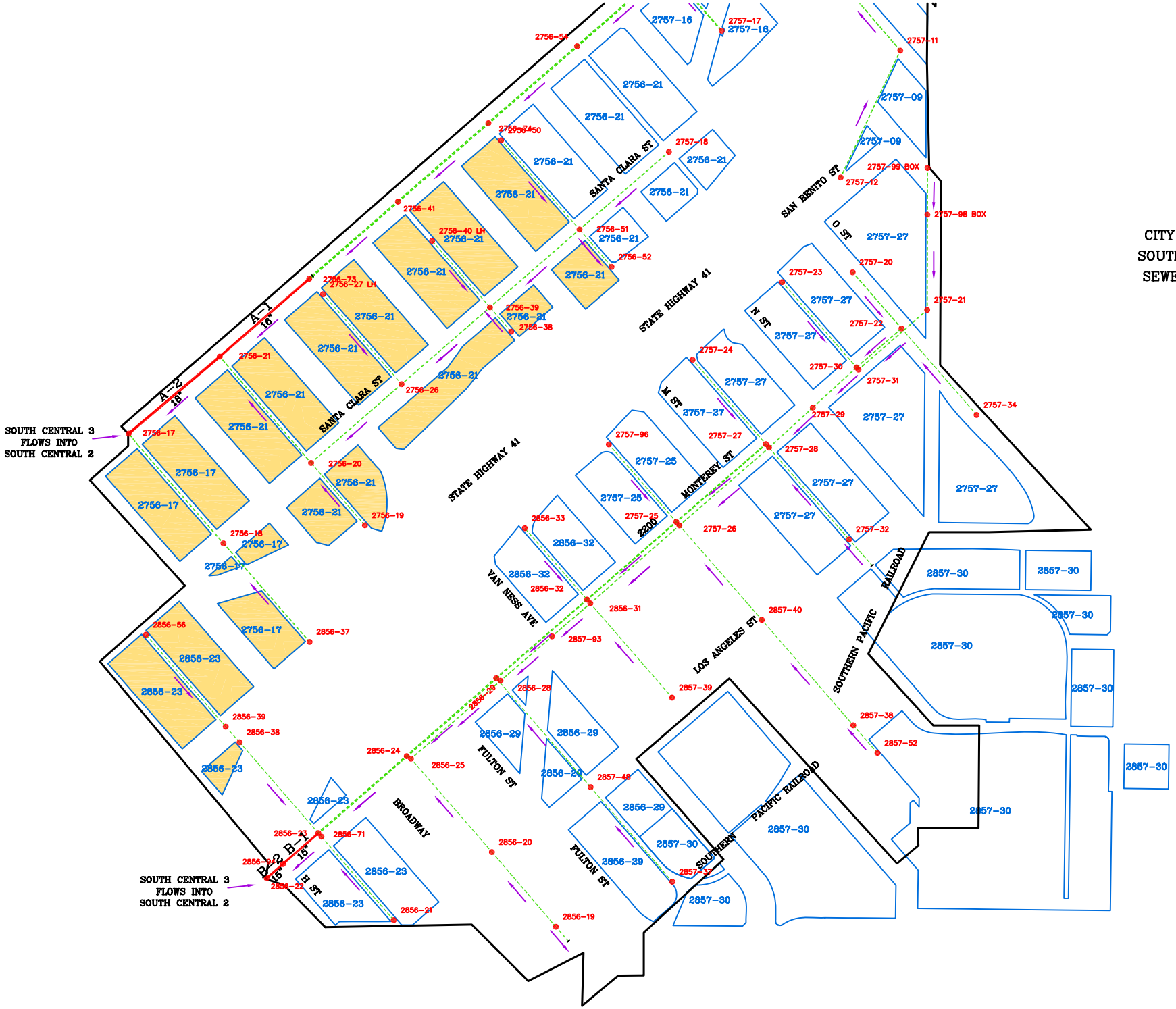
NORTH CENTRAL 10
FLOWS INTO
NORTH CENTRAL 7
CITY OF FRESNO
NORTH CENTRAL 7
SEWER SUBBASIN
Dashed Red Surround = Over Capactiy
NORTH CENTRAL 7
FLOWS INTO
NORTH CENTRAL 8
JS
2755-62
SAN JOAQUIN ST
FULTON ST
STANISLAUS ST
TULARE ST
MERCED ST
FRESNO ST
BROADWAY
BROADWAY PLZ
M ST
N ST
L ST
H ST
MARIPOSA
MADDY DR
UNION PACIFIC RAILROAD


CITY OF FRESNO
NORTH CENTRAL 8
SEWER SUBBASIN
Dashed Red Surround = Over Capacity
JS
2755-62
NORTH CENTRAL 7
FLOWS INTO
NORTH CENTRAL 8
JS
2754-33
STATE HIGHWAY 99
FRESNO ST SUBWAY
G ST
1400 STANISLAUS ST
F ST
TUOLUMNE ST
E ST
MERCED ST
FRESNO ST
MARIPOSA ST
CHINA ALLEY
PAGAN ALLEY
KERN ST
INYO ST


SOUTH CENTRAL 2
FLOWS INTO
SOUTH CENTRAL 3
CITY OF FRESNO
SOUTH CENTRAL 2
SEWER SUBBASIN
SOUTH CENTRAL 2
FLOWS INTO
SOUTH CENTRAL 3
IS
2856-14
IS
2856-65



CITY OF FRESNO
NORTH CENTRAL 10
SEWER SUBBASIN
Dashed Red Surround = Over Capacity


CITY OF FRESNO
SOUTH CENTRAL 3
SEWER SUBBASIN
SOUTH CENTRAL 3
FLOWS INTO
SOUTH CENTRAL 2
SOUTH CENTRAL 3
FLOWS INTO
SOUTH CENTRAL 2
A-1
16"
A-2
16"
B-1
16"
B-2
16"
SANTA CLARA ST
STATE HIGHWAY 41
SAN BENITO ST
O ST
N ST
M ST
MONTEREY ST
VAN NESS AVE
LOS ANGELES ST
SOUTHERN PACIFIC RAILROAD
FULTON ST
BROADWAY
H ST
2200

K.2 - Water Memorandum

City of FRESNO

Department of Public Utilities – Water Division

WATER & CONSERVATION • SOLID WASTE & RECYCLING • WASTEWATER & RECLAMATION • DPU

Providing Life's Essential Services

DATE: July 5, 2013

TO: WILMA QUAN, Urban Planning Specialist
Development and Resource Management, Downtown and Community Revitalization

FROM: BROCK D. BUCHE, PE, PLS, Supervising Professional Engineer BDB
Department of Public Utilities, Water Division

RE: WATER SUPPLY AND DELIVERY INFRASTRUCTURE WITHIN THE DOWNTOWN PLANS AREA

I have reviewed the Fulton Corridor Specific Plan and Community Plan EIR Technical Report dated February 6, 2013 prepared by Sherwood Design Engineers ("Technical Report") and agree with its analysis and conclusions regarding the water supply and the distribution network for water delivery within the boundaries of the Downtown Neighborhood Community Plan ("DNCP") and the Fulton Corridor Specific Plan ("FCSP"). The purpose of this memorandum is to supplement the information and analysis contained in the Technical Report with additional information that further supports the conclusions in the Technical Report and to address new information and analysis that has been completed. As such, this memorandum will address the following topics: (1) the Technical Report's reliance on information and analysis in the City's 2008 Urban Water Management Plan; (2) the ability of the City's current and planned infrastructure improvements to deliver necessary water to the DNCP; and (3) the ability of the City's current and planned infrastructure to deliver water to the largely vacant commercial buildings adjacent to the Fulton Mall should they be reoccupied, as anticipated in the FCSP.

1. The Technical Report's Reliance on Information and Analysis in the 2008 Urban Water Management Plan

The Water Division is aware that Sherwood Design Engineers has been working on the preparation of this Technical Report for over a year. At the time it commenced preparation of the Technical Report and prepared its first administrative draft, the 2005 Urban Water Management Plan (adopted August 2008, and herein referred to as the 2008 UWMP) was the City's operative Urban Water Management Plan. As such, it was appropriate for the Technical Report to incorporate and rely upon the information and analysis contained in it. As such, at various places the Technical Report makes reference to information and analysis contained in the 2008 UWMP and relies upon it in its analysis related to existing and projected water supply and demand.[1]

In November, 2012, the City adopted an update to the 2008 UWMP. This updated UWMP ("2010 UWMP") changed the methodology for determining anticipated water demand from a land use methodology to a per-capita methodology. This change was made primarily to conform to the

[1] For instance, see Technical Report, p. 3, section 2.1 and subsection 2.1.1.1; p. 4; p. 10, subsection 2.1.3.1; p. 17, subsection 2.1.4.2; p. 18.

new approach outlined by the California Department of Water Resources for the preparation of 2010 Urban Water Management Plans. Both the per capita and land use methodologies were previously evaluated in the Phase 1 Report of the Metropolitan Water Resources Management Plan and were found to be relatively close in predicting water demands, though the land use approach provided a slightly better fit to the data set. Either approach will provide satisfactory results, but from the perspective of water demand forecasting, the 2008 UWMP land use approach is preferred by the Water Division.

That being said, the Water Division believes that the Technical Report's reliance the information and analysis in the 2008 UWMP has resulted in conclusions that are consistent, if not more conservative, than conclusions based upon the 2010 UWMP. This is because the 2010 UWMP is projecting significantly lower water demand than what was projected in the 2008 UWMP due to higher than expected demand reductions associated to the installation of residential water meters throughout the city. As an example, the Technical Report, at p. 3, states that the 2008 UWMP projected the City's water demand in 2010 to be 163,300 acre feet. This is confirmed by Figure 4-6 in the 2008 UWMP (See Exhibit "A".). However, Figure 4-3 of the 2010 UWMP notes that the City's actual water demand in 2010 was 147,053 acre feet (See Exhibit "B".). In addition, Figure 4-6 in the 2008 UWMP projects the City's water demand at 233,400 acre feet in 2025. However, Figure 4-3 in the 2010 UWMP projects anticipated water demand of between 183,700 acre feet and 201,900 acre feet in 2025. Finally, the 2008 UWMP was prepared based upon the development and population assumptions set forth in the 2025 Fresno General Plan. The 2025 Fresno General Plan anticipated full build-out of the area covered by these plans by the year 2025 and a population of approximately 99,393 within the boundaries of the DNCP and FCSP at full build-out. However, population growth within the boundaries of these plans has been much slower than anticipated in the 2025 Fresno General Plan. The DNCP and FCSP have established the year 2035 to be the full build-out date for their respective plan areas and project a population of 99,393 within these plans boundaries by the year 2035. As such, the analysis in the 2008 UWMP for water demand at the time of build-out are consistent with those in the 2010 UWMP even though the buildout date has been extended by 10 years, from 2025 to 2035.

As mentioned above, since its implementation of meter based water rates throughout the City in December 2012, the City has seen a dramatic reduction in water usage from an average of 300 gallons per person per day to approximately 240 gallons person per day. This represents a 20% reduction in water usage which far exceeds the 10% reduction predicted in the 2008 UWMP with the implementation of metered water rates. The Technical Report notes on p. 18 that the 2008 UWMP predicted that the implementation of the demand reduction policies identified in it would result in a decrease in water demand to 243 gallons per person per day by 2020. As it is still early in the process of implementing the metered water rate structure, it is unclear whether the dramatic decreases in water demand will be sustained long-term. However, these initial results are very promising.

With regard to Water Supply, the 2008 UWMP and 2010 UWMP identify the same sources of water supply and the same necessary water supply infrastructure to reduce the City's reliance on groundwater. These plans outline a means in which the City will attain equilibrium with regard to its extraction and replenishment of the groundwater aquifer by 2025. One of the sources of water called for in both the 2008 and 2010 UWMP is recycled water. It is anticipated that by 2025 recycled water will contribute 25,000 acre feet per year to the City's overall water supply. The

use of recycled water is not location specific and just requires a proportionate offset of potable water required throughout the City.

In summary, the Water Division is comfortable that the Technical Report's reliance on the information in the 2008 UWMP has resulted in reliable conclusions that are very conservative and represent a reasonable "worst-case" scenario.

2. The Ability Of The City's Current And Planned Infrastructure Improvements To Deliver Necessary Water To The DNCP

The Technical Report at p. 15 notes that the Fulton Corridor Hydraulic Evaluation did not include the DNCP so there are no specific recommendations for distribution system improvements related to the DNCP contained in that evaluation. The Water Division did not believe that it was necessary to conduct a new hydraulic study of the DNCP plan area outside of the FCSP plan area because the DNCP's planned development is consistent with what was planned for in the City's current 2025 Fresno General Plan. The City's Metropolitan Water Resources Plan modeled the entire city to evaluate the necessary infrastructure to implement buildout of the 2025 Fresno General Plan. This is confirmed on p. 16 of the Technical Report which states:

> As noted above, though, the (maximum) build-out population would be nearly identical to that envisioned under the 2025 General Plan, and no significant changes are anticipated in the overall level of commercial/industrial development. Consequently, total consumptive water demand under the proposed plan would be largely unchanged from General Plan projections, so it is expected the area's existing water distribution network would support densification of the Plan Area in accordance with the DNCP, as long as the City continues to implement recommendations set forth in the 2008 UWMP and in the Fresno Metropolitan Water Resources Management Plan. **It is noted, though, that individual pipelines may require upgrades beyond those recommended in these studies to accommodate both higher fire flows and higher localized demands associated with the proposed concentration of development along the Plan Area's commercial corridors.** (Bold added)

The necessary infrastructure identified in the City's Metropolitan Water Resources Management Plan are identified below in subsections 3.1 (3 million gallon water storage tank) and 3.2 (Regional Transmission Main). No major infrastructure improvements in addition to these improvements are required to adequately serve the DNCP area with buildout of the proposed DNCP land uses.

As to the final statement above regarding the proposed concentration of development along commercial corridors, we would like to clarify that currently it is our understanding that the DNCP proposes to allow for an increase in building height along certain commercial corridors from the current maximum height of 2.5 and 3 floors to a proposed maximum height of 5 floors. For the DNCP plan area, this 5 floor maximum would be allowed on property given the "Town Center" land use designation and corresponding zoning. Though the Water Division believes that the current water delivery infrastructure would be able to adequately support building heights permissible in the 2025 GP, we believe that projects proposing heights in excess of those

previously permitted will need to perform additional hydraulic modeling to determine what additional "project specific" water delivery infrastructure will be required to support the project and provide adequate fire flows. The Water Division requests that this requirement be a condition of approval for any project within the DNCP boundaries but outside the boundaries of the FCSP that proposes building heights in excess of 2.5 floors.

In addition, it should be noted that because of the age of the water deliver infrastructure within the DNCP, as acknowledged in the Technical Report, when new projects are proposed in the DNCP, the existing water delivery infrastructure to supply the proposed project will have to be evaluated for possible upgrades and/or replacement. The upgrades largely will be due to changes in design standards which now evaluate maximum velocities for various flow conditions, one of which typically controls sizing being the maximum day demand plus fire flow condition. Additionally, fire flow requirements themselves have evolved since the existing infrastructure was built and have become dictated based on structure construction materials, occupancy use, and height. The existing aged infrastructure was not sized in accordance with these new requirements and may necessitate replacement with a larger diameter pipe.

3. **The Ability Of The City's Current And Planned Infrastructure To Deliver Water To The Largely Vacant Commercial Buildings Adjacent To The Fulton Mall Should They Be Reoccupied, As Anticipated In The FCSP**

One of the key implementing measures in the FCSP is to revitalize the Fulton Mall to spur increased economic activity in the vicinity of the Fulton Mall. Various options are proposed to revitalize the Fulton Mall. Currently, the buildings along the Fulton Mall have an estimated average vacancy rate of 46 percent for office space and a 35 percent vacancy rate for retail space. This represents approximately 300,000 square feet of vacant office space and 430,000 square feet of vacant retail space for a total of approximately 730,000 square feet of commercial space. In comparison, the rest of downtown has an average estimated vacancy rate of 12.7 percent for office space and 11.2 percent for retail space. It is our understanding that the goal for the buildings along the Fulton Mall is that they achieve occupancy rates that approach the occupancy rates in the rest of downtown.

The Fulton Corridor Hydraulic Evaluation pertained to the entire FCSP area, inclusive of, but not separately from re-occupancy of the buildings along the Fulton Mall.

First, we agree with the statement in the Technical Report, Section 1.2 Overview, at p. 1, that

> The [existing] areas covered by the Specific Plan and the Community Plan are adequately served by the City's existing water ... infrastructure.

That being said, it is our professional opinion that to provide an adequate water supply to reoccupied buildings along the Fulton Mall at occupancy rates equivalent to the rest of downtown, the following infrastructure would need to be in place:

3.1 The construction of the 3 million gallon (MG) water storage tank identified in the 2009 and 2011 Downtown Central Area Hydraulic Evaluations. (See Technical Report, p. 14.) The location of this tank will be on property located H Street, southeast of Ventura Avenue.

3.2 The construction of the Regional Transmission Main from a location near Well Site 172 to the 3 million gallon water storage tank. This Transmission Main would convey water from Well Site 172 and other wells in the vicinity to turnouts in the downtown area, including locations near the Fulton Mall. When completed, this transmission main would provide water to fill the 3 million gallon water storage tank and when the tank is not filling, supplement Downtown area demand.

With this additional water supply, there will be sufficient water to support the re-occupancy of the buildings along Fulton Mall. The City has completed and approved the environmental assessments for both of these infrastructure projects. In addition, both of these projects are fully funded in the Department of Public Utilities Capital Improvement Plan. The preparation of construction drawing and specifications for the 3 MG Tank Facility, known as T-4, are presently at 95% completion. Funding for construction of this facility will be available in FY14 in the Water Division's Enterprise Fund and is predicated on a rate increase. The Department of Public Utilities made an informational presentation to City Council regarding initiation of the Proposition 218 process on March 7, 2013. Subsequently, City Council has authorized proceeding with the Proposition 218 process on June 27, 2013. In regards to the construction of the Regional Transmission Main from the intersection of Belmont and Hughes Avenues to the T-4 Facility, funding is available in the 2010 Water Revenue Bond A-1 Fund, construction plans and specifications are complete, as of the date of this memorandum the project has been awarded for construction.

In addition to the completion of these two infrastructure projects, when the building owner proposes to re-occupy these buildings, they will have to perform hydraulic evaluations to determine what internal building water system improvements may be needed to ensure water delivery to the upper floors of these buildings. Such internal building improvements will likely include booster pumps. The building owner will also have to work with the City's Building & Safety Division and Fire Department to address adequacy of fire suppression systems.

Thank you for providing the Water Division the opportunity to provide further comments and clarifications related to the Technical Report. If after reviewing this memorandum you have any questions, please feel free to contact me.

K.3 - Sewer Memorandum

City of FRESNO

DEPARTMENT OF PUBLIC UTILITIES
WASTEWATER MANAGEMENT DIVISION
MEMORANDUM

WATER & CONSERVATION • SOLID WASTE & RECYCLING • WASTEWATER & RECLAMATION • DPU

Providing Life's Essential Services

DATE: July 12, 2013

TO: WILMA QUAN, Urban Planning Specialist
Downtown/Community Revitalization

FROM: STEPHEN A. HOGG, Assistant Director of Public Utilities
Department of Public Utilities

SUBJECT: RESPONSE TO QUESTIONS RELATED TO DNCP AND FCSP ENVIRONMENTAL STUDIES

Please accept this memo as response to the Utility Information Request for Downtown Neighborhoods Community Plan (DNCP), and Fulton Corridor Specific Plan (FCSP), and Fulton Mall, dated February 22, 2013, as it relates to Wastewater/Sewer and Recycled Water. The responses are provided in red for questions found in a document and email provided by Wilma Quan.

Wastewater/Sewer

DNCP/FSCP

1. To eliminate potential future comments regarding wastewater generation conveyed to the sewer system and the wastewater treatment plant, can you state the future generation of wastewater in the DNCP and FCSP took into account the additional wastewater that would be conveyed to the sewer system and the wastewater treatment plant from the conversion of existing lots that have septic tanks to a sewered system. Depending on the amount of the conversions, it could result in a substantial additional wastewater flow. However, we hope that the City previously took this into account during the modeling of the 2025 General Plan.

   The number of parcels on septic tanks in the DNCP and FCSP areas is few enough, if any, that any impact on treatment capacity would be negligible.

2. In determining the capacity requirements for the wastewater treatment plant and sewer lines, did the 2006 Wastewater Collection System Master Plan account for the additional wastewater that would be collected in a sewer system from the conversion of lots with septic tanks to a sewer system?

   The Sewer Collection System model used to evaluate system capacity assumes all parcels within the service area are connected to the system for the identified land use. Therefore the model by default takes into account the conversion of septic tanks, if any.

3. Please confirm that only the upgrades identified in the 2006 Wastewater Collection System Master Plan are the only upgrades for the buildout of the DNCP. Is the 2006 study the most recent study that identifies required improvements for the DNCP area?

   The 2006 Wastewater Collection System Master Plan is the most recent master plan document associated with the sewer collection system in the Fresno area. However, the Wastewater Management Division has recently developed a dynamic sewer collection system model for evaluating the capacity of the collection system. The model was run assuming build out of the DNCP and 2025 General Plan, as well as the current land use assumptions being used to develop the 2035 General Plan. Attached is a list of potential projects needed to address capacity issues. The list is similar to that in the report provide to Sherwood by Doug Hecker, Supervising Engineering Technician, of the Public Utilities Department Utilities Planning and Engineering group, dated July 2011 for the Fulton Corridor Specific Plan Project Area. Attachment 1 is a table identifying all sewer collection system pipe segments with capacity issues and the recommendations for addressing each segment. Attachment 2 is a map of the study area for the collection system in the downtown area. The map location numbers in Attachment 1 correspond with the number pipe segments in red on Attachment 2. Five of the projects identified in Attachment 1 have capacity impacts related to the DNCP (yellow highlighted projects). Attachment 1 lists those improvements required to be implemented as a result of development within the area defined as the Downtown Neighborhoods Community Plan (DNCP) area. The recommendations that are not highlighted and are identified in Attachment 1 are those improvements that were previously identified in the 2006 Sewer Master Plan and were required with development previously planned in the area defined as the DNCP area. The recommendations that are highlighted and are identified in Attachment 1 are those improvements that are required as a result of the proposed DNCP land uses in addition to those previously required with development in the area defined as the DNCP area. Therefore, the recommendations that are not highlighted and highlighted include those improvements that are required with the implementation of the proposed DNCP land uses.While several of the pipe segments addressed by projects #8 and #9 have impacts specific to implementation of the DNCP, these projects must be implemented without the DNCP in order to address other capacity issues. Therefore, these projects should not be considered an impact of the DNCP. Only projects #10, #11, and #12 should be considered as having an impact and are necessitated as a result of the DNCP. None of the projects

identified are located in the FCSP or the Fulton Mall or have flow impacts related specifically to the FCSP or the Fulton Mall.

4. Please identify the three areas of the DNCP as referenced on page 26 of the Sherwood Report that may result in wastewater flows that exceed previous estimates. We understand the improvements have not been identified; however, please identify the general type of improvements that may be required to reduce the impact. We will need to identify these improvement types as part of mitigation related to potential wastewater/sewer impacts.

   I am not familiar with what the three areas are. See response to Number 2 above.

Fulton Mall

1. Existing and required improvements to sewer infrastructure are illustrated on Figure 2.6 of the Sherwood Report. Given that there are no sewer line improvements within the Fulton Mall area which include Tuolumne Street to the northwest, Van Ness Boulevard to the northeast, Inyo Street to the southeast, and Broadway Street to the southwest, we assume that the implementation of the Fulton Mall project would be able to be accommodated by the existing pipelines. Is this correct?

   No capacity related projects are needed specifically for the Fulton Mall project. See response to Number 2 below for condition related projects.

2. Will existing sewer lines in the Fulton Mall area be replaced due to their age? If so, please identify what sewer lines will be replaced and identify the general depth of the sewer line. The purpose of this question is to provide parameters for our air quality evaluation.

   Several projects have been identified in the area as a result of conditions other than capacity related issues, see Attachment 3. These projects are not as a result of impacts from the Fulton Mall project, however it is only logical these projects be completed either prior to or as part of the Fulton Mall porject to avoid rework or damage to street improvements related to the Fulton Mall Project. Lines in the downtown area general range from six to twelve feet in depth for the smaller lines and as deep as twenty feet for the larger lines. Where ever possible, the large or deeper line will be rehabilitated using trenchless technology which requires very little earthwork.

3. Please confirm that none of the sewer pipeline improvements shown in Figure 2.6 of the Sherwood Report are required with the development of the Fulton Mall Project.
   See response to Number 2 above.

Recycled Water

1. At a project level (i.e., implementing only the FCSP and DNCP) without any other development within the City, will development in accordance with the FCSP and DNCP require the use of recycled water from a water supply perspective. We understand that only 76 acres of the FCSP will eventually use recycled water; however, is the use of recycled water a cumulative water supply issue with City growth through 2035?

   From a recycled distribution system perspective, we understand that the FCSP includes the installation of recycled water lines and at this time it does not appear that there is any commitment in the FCSP to either (1) upgrade a portion of the existing Recycled Water Reclamation Facility (page 27 last paragraph) or (2) construct a satellite treatment plant in Downtown (page 30 first paragraph). Therefore, a recycled water supply for the FCSP and/or DNCP does not appear to be part of the DNCP or FCSP plans. It appears to be part of the greater City growth through 2035 which is the cumulative growth.

We need City DPU staff to confirm that the use of recycled water is not required to provide the DNCP and FCSP with water supply and that the use of recycled water is only required to address a cumulative water supply issue for 2035.

The use of recycled water in the downtown area is not a water supply issue directly related to the implementation of the DNCP or FCSP. However, it is critical that all opportunities to develop the use of recycled water be evaluated to address overall community water supply needs. It is therefore important that the construction of recycled water facilities in the plan areas be considered.

While the construction of the recycled water system to connect the downtown area with the Regional Wastewater Reclamation Facility for the supply of recycled water and redundancy the construction of a satellite recycled water facility or "scalping plant" in the downtown area provides several advantages such as reduced energy demand for pumping, treatment system redundancy, and the freeing up of wastewater collection system capacity thereby reducing the need for system capacity enhancements. The construction of the downtown recycled water treatment facility should be included in the plans, but such a facility is not required to provide an adequate water supply to support the build-out of the DNCP and FCSP plan areas.

Attachments:

Attachment 1 – Table of Identified Projected Flow Infrastructure Deficiencies with Downtown Plan

Attachment 2 – Map of Fulton Corridor with Full Downtown Plan Identified Projected Flow Infrastructure Deficiencies

Attachment 3 – Fulton Corridor Sewer Assessment Capital Improvement Projects

cc: Kevin Norgaard
Doug Hecker

ATTACHMENT 1

DOWNTOWN PLAN WITH FULTON CORRIDOR
PROJECTED FLOW INFRASTRUCTURE DEFICIENCIES

Prepared by: DPU WW Tech Services

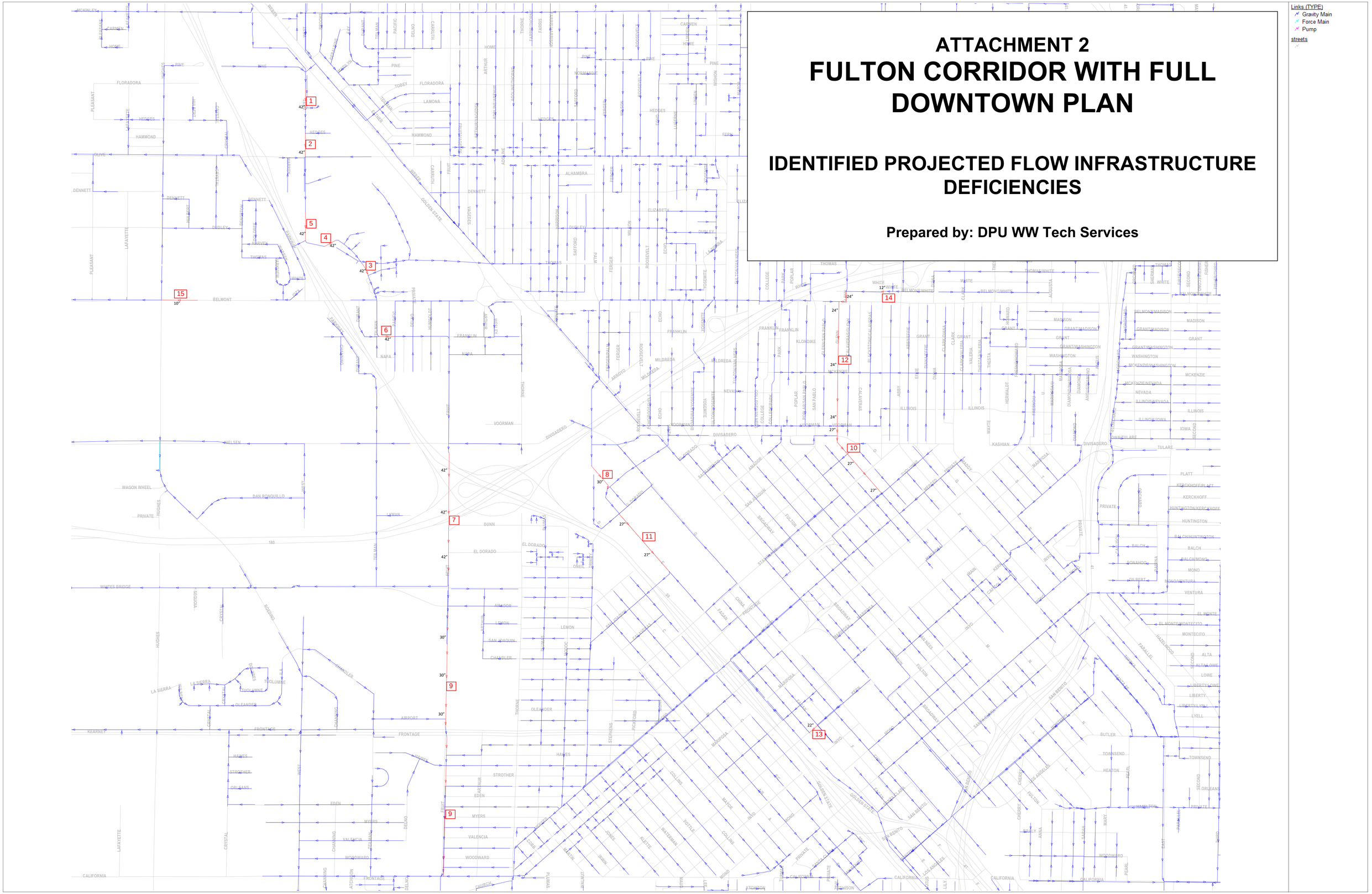
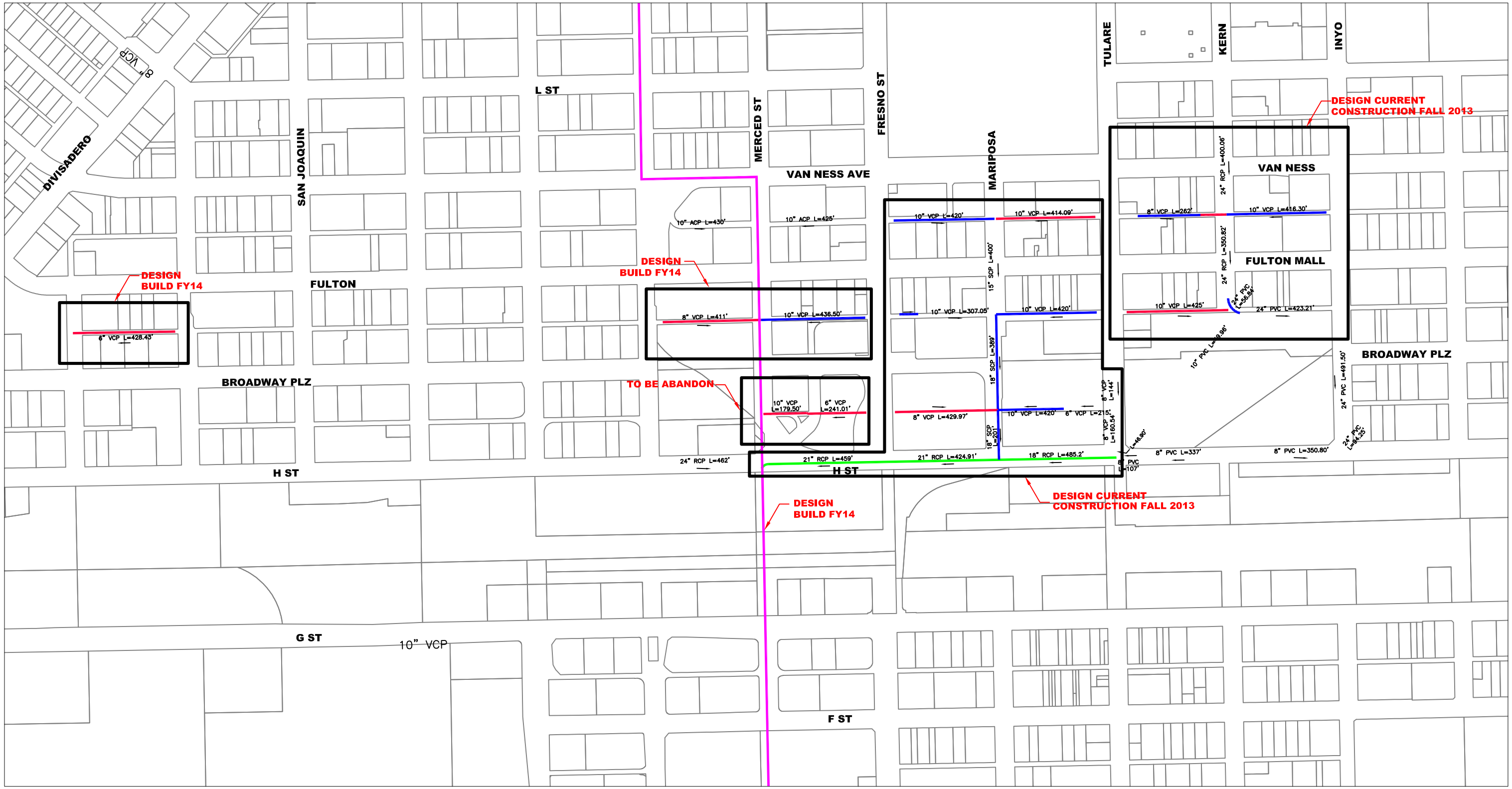
	EXISTING CONDITIONS 2025 GENERAL PLAN				GENERAL PLAN UPDATE INCLUDING DOWNTOWN NEIGHBORHOOD COMMUNITY PLAN IMPACTS							
Map Location	Pipe ID	Pipe Diameter	Flow (MGD)	Maximum d/D	Increased flow (MGD)	Flow (MGD)	Existing pipe Friction	Maximum d/D	Notes	Recommendations to meet downtown community plan impacts	Existing pipe Friction	Maximum d/D
1	27242	42	15.13	0.748	N/C	15.13	0.010	0.75	Pipe ok as is for future*	No Action Existing or Future -This pipe will be at max Capacity	0.010	0.748
2	27245	42	15.133	0.816	0.017	15.15	0.010	0.82	constant flow at 0.8	No Action Existing or Future - d/D=.8 is acceptable in this case	0.010	0.817
3	29244	42	14.989	1.000	0.158	15.15	0.010	1.00	d/D=1 < 4 hours	No Action Existing or Future - Full Pipe due to low slope	0.010	1.000
4	29248	42	15.048	1.000	0.138	15.19	0.013	1.00	adverse pipe	No Action Existing or Future - Uphill pipe slope	0.013	1.000
5	29250	42	15.073	1.000	0.085	15.16	0.010	1.00	d/D=1 < 1 hour	No Action Existing or Future - Full Pipe due to low slope	0.010	1.000
6	30988	42	14.901	0.814	0.191	15.09	0.010	1.00	d/D=1 < 1 hour	No Action Existing or Future - Full Pipe due to low slope	0.010	1.000
7	33032	42	14.866	1.000	0.158	15.02	0.010	1.00	d/D=1 < 4 hours	No Action Existing or Future - Full Pipe due to low slope	0.010	1.000
7	33033	42	14.912	1.000	0.200	15.11	0.010	1.00	d/D=1 < 4 hours	No Action Existing or Future - Full Pipe due to low slope	0.010	1.000
7	33036	42	14.896	0.719	0.160	15.06	0.011	0.725	d/D=1 for 4 hours	No Action Existing or Future - Full Pipe due to low slope	0.011	0.725
7	33037	42	14.881	0.727	0.128	15.01	0.011	0.732	d/D=1 for 4 hours	No Action Existing or Future - Full Pipe due to low slope	0.011	0.732
8	33209	30	3.663	1.000	0.778	4.44	0.013	1.00	Flat Pipe No surcharging	Reline - Existing and Future	0.010	1.000
8	33210	30	3.624	0.698	0.778	4.40	0.013	1.00	d/D=1 < 1 hour	Reline - Future only	0.010	0.666
9	34865	30	11.187	1.000	0.194	11.38	0.010	1.00	d/D=1 > 5 hours surcharging	Existing and Future need Possible New Structure to Adjust Flow Split @ Fruit/Whites Bridge	0.010	0.667
9	34866	30	11.2	1.000	0.190	11.39	0.010	1.00	d/D=1 > 5 hours surcharging	Existing and Future need Possible New Structure to Adjust Flow Split @ Fruit/Whites Bridge	0.010	0.641
9	34879	30	11.221	1.000	0.181	11.40	0.010	1.00	d/D=1 > 5 hours surcharging	Existing and Future need Possible New Structure to Adjust Flow Split @ Fruit/Whites Bridge	0.010	0.727
9	34880	30	11.166	0.728	0.200	11.37	0.010	0.74	d/D=1 >5 hours surcharging	Future only need Possible New Structure to Adjust Flow Split @ Fruit/Whites Bridge	0.010	0.564
9	34881	30	11.163	1.000	0.194	11.36	0.010	1.00	d/D=1 > 5 hours surcharging	Existing and Future need Possible New Structure to Adjust Flow Split @ Fruit/Whites Bridge	0.010	0.805
9	36625	30	11.157	1.000	0.195	11.35	0.010	1.00	d/D=1 > 5 hours surcharging	Existing and Future need Possible New Structure to Adjust Flow Split @ Fruit/Whites Bridge	0.010	0.640
9	36627	30	11.203	1.000	0.202	11.40	0.010	1.00	d/D=1 > 5 hours surcharging	Existing and Future need Possible New Structure to Adjust Flow Split @ Fruit/Whites Bridge	0.010	0.669
9	36628	30	11.179	1.000	0.208	11.39	0.010	1.00	d/D=1 > 5 hours surcharging	Existing and Future need Possible New Structure to Adjust Flow Split @ Fruit/Whites Bridge	0.010	0.631
9	36629	30	11.146	0.776	0.216	11.36	0.010	0.79	constant flow at .8	Future only need Possible New Structure to Adjust Flow Split @ Fruit/Whites Bridge	0.010	0.593
10	31318	27	4.923	0.772	0.443	5.37	0.013	1.00	d/D=1 >5 hours surcharging	Reline - Future only	0.010	0.676
10	31319	27	4.923	0.705	0.450	5.37	0.013	0.76	d/D=1 >5 hours surcharging	Reline - Future only	0.010	0.626
10	33381	27	4.913	0.721	0.459	5.37	0.013	0.78	d/D=1 >5 hours surcharging	Reline - Future only	0.010	0.638
10	33382	27	4.895	0.712	0.483	5.38	0.013	0.77	d/D=1 >5 hours surcharging	Reline - Future only	0.010	0.633
11	33214	27	3.712	0.653	0.869	4.58	0.013	0.77	d/D=1 >5 hours surcharging	Reline - Future only	0.010	0.632
11	33257	27	3.694	0.655	0.865	4.56	0.013	0.77	d/D=1 >5 hours surcharging	Reline - Future only	0.010	0.634
12	29692	24	3.257	0.655	1.380	4.64	0.013	1.00	d/D=1 >5 hours surcharging	Reline - Future only	0.010	0.701
12	29693	24	3.249	0.670	1.377	4.63	0.013	1.00	d/D=1 >5 hours surcharging	Reline - Future only	0.010	0.718
12	31316	24	3.24	0.652	1.369	4.61	0.013	1.00	d/D=1 >5 hours surcharging	Reline - Future only	0.010	0.697
12	337959	24	3.471	0.694	1.137	4.61	0.013	1.00	d/D=1 >5 hours surcharging	Reline - Future only	0.010	0.709
13	35212	22	1.104	0.723	0.051	1.15	0.013	0.75	d/D=1 <1 hour	No Action Existing or Future	0.013	0.750
14	29914	12	0.213	1.000	0.101	0.31	0.013	1.00	adverse pipe	No Action Existing or Future	0.013	1.000
15	29144	10	0.015	0.106	0.659	0.67	0.013	1.00	ok	No Action Existing or Future	0.013	1.000

7/12/2013 10:28

ATTACHMENT 2
FULTON CORRIDOR WITH FULL DOWNTOWN PLAN

IDENTIFIED PROJECTED FLOW INFRASTRUCTURE DEFICIENCIES

Prepared by: DPU WW Tech Services



ATTACHMENT 3
FULTON CORRIDOR SEWER ASSESSMENT
CAPITAL IMPROVEMENT PROJECTS