Volume 2 - Appendices

FRESNO METROPOLITAN WATER RESOURCES MANAGEMENT PLAN UPDATE

Draft Environmental Impact Report
SCH# 2013091021

Prepared for
City of Fresno

February 2014

ESA

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Appendix A
Notice of Preparation

NOTICE OF PREPARATION

Date: **September 6, 2013**

To: **California Office of Planning and Research, Responsible and Trustee Agencies, and other Interested Parties**

From: **Brock Buche, Project Manager, City of Fresno Department of Public Utilities**

Subject: **Notice of Preparation of a Draft Environmental Impact Report**

Project Title: Fresno Metropolitan Water Resources Management Plan Update

The City of Fresno (City) will be the Lead Agency to prepare an Environmental Impact Report (EIR) for the Fresno Metropolitan Water Resources Management Plan Update and certain near-term projects (Metro Plan Update or proposed project). The City would like to know your views (or the views of your agency) as to the scope and content of the environmental information and analysis that should be contained in the Metro Plan Update EIR.

The overall objective of the City Metro Plan Update is to supply sufficient and reliable water supplies to meet the demands of existing and future customers through buildout of the applicable Fresno General Plan. The study area for the Metro Plan Update includes the existing city limits and City of Fresno Sphere of Influence (SOI) area designated by the 2025 Fresno General Plan as more particularly detailed in the attached Project Description. Because the City is in the process of updating its general plan, the EIR will analyze the project with regard to the adopted general plan in effect at the time of consideration of certification of the EIR.

The purpose of this Metro Plan Update is to update and refine the 1996 Fresno Metropolitan Water Resources Management Plan (1996 Metro Plan) taking into consideration available new data and accommodating physical and institutional changes which have occurred since the 1996 Metro Plan was prepared. The completed Metro Plan Update would facilitate future water resources decisions and utility planning, and would satisfy requirements for potential State funding. Implementation of the City's recommended water supply program would result in a significant shift in the use of available water resources and an increase in diversity in the City's water supply portfolio which will enhance the City's overall water supply reliability. Implementation of the Metro Plan Update involves near-term and long-term water projects including, surface water treatment and storage facilities; a raw water intake; groundwater supply, storage and recharge facilities; recycled water treatment and distribution facilities; water distribution pipelines; and increased water conservation measures.

The EIR will be designed to function as both a program-level EIR for the overall Metro Plan Update (including future projects) and a project-level EIR for proposed near-term projects (construction anticipated by 2018). Please see the attached Project Description for further details on the proposed project.

This Notice of Preparation (NOP) and the attached project description can also be found at these locations:

- City website - www.fresno.gov/water (go to "Important Documents")
- City of Fresno Department of Public Utilities Water Division, 1910 East University Avenue, Fresno, CA 93703-2988
- City of Fresno City Hall, 2600 Fresno Street, 4th Floor, Room 4019, Department of Public Utilities Administration, Fresno CA 93721
- County of Fresno Central Library, 2420 Mariposa Street, Fresno CA 93721

Written comments on the scope of the EIR must be received no later than 30 days after publication of this NOP, by 5:00 p.m. on October 14, 2013. Please send your written responses to:

Brock Buche, Project Manager
City of Fresno Department of Public Utilities, Water Division
1910 East University Avenue
Fresno, CA 93703-2988
(559) 621-5325
FresnoMetroPlan@esassoc.com

In order for the public and regulatory agencies to have an opportunity to ask questions and submit oral comments on the scope of the EIR, two scoping meetings will be held as follows:

- A public agency scoping meeting will be held on September 16, 2013 from 2:30 p.m. to 4:00 p.m. in the large conference room of the City of Fresno Department of Public Utilities Water Division Corporation Yard located at 1910 East University Avenue, Fresno, CA 93703-2988
- A public scoping meeting for other interested parties will be held on September 16, 2013 from 6:00 p.m. to 8:00 p.m. in the large conference room of the City of Fresno Department of Public Utilities Water Division Corporation Yard located at 1910 East University Avenue, Fresno, CA 93703-2988

SECTION 1
Project Description

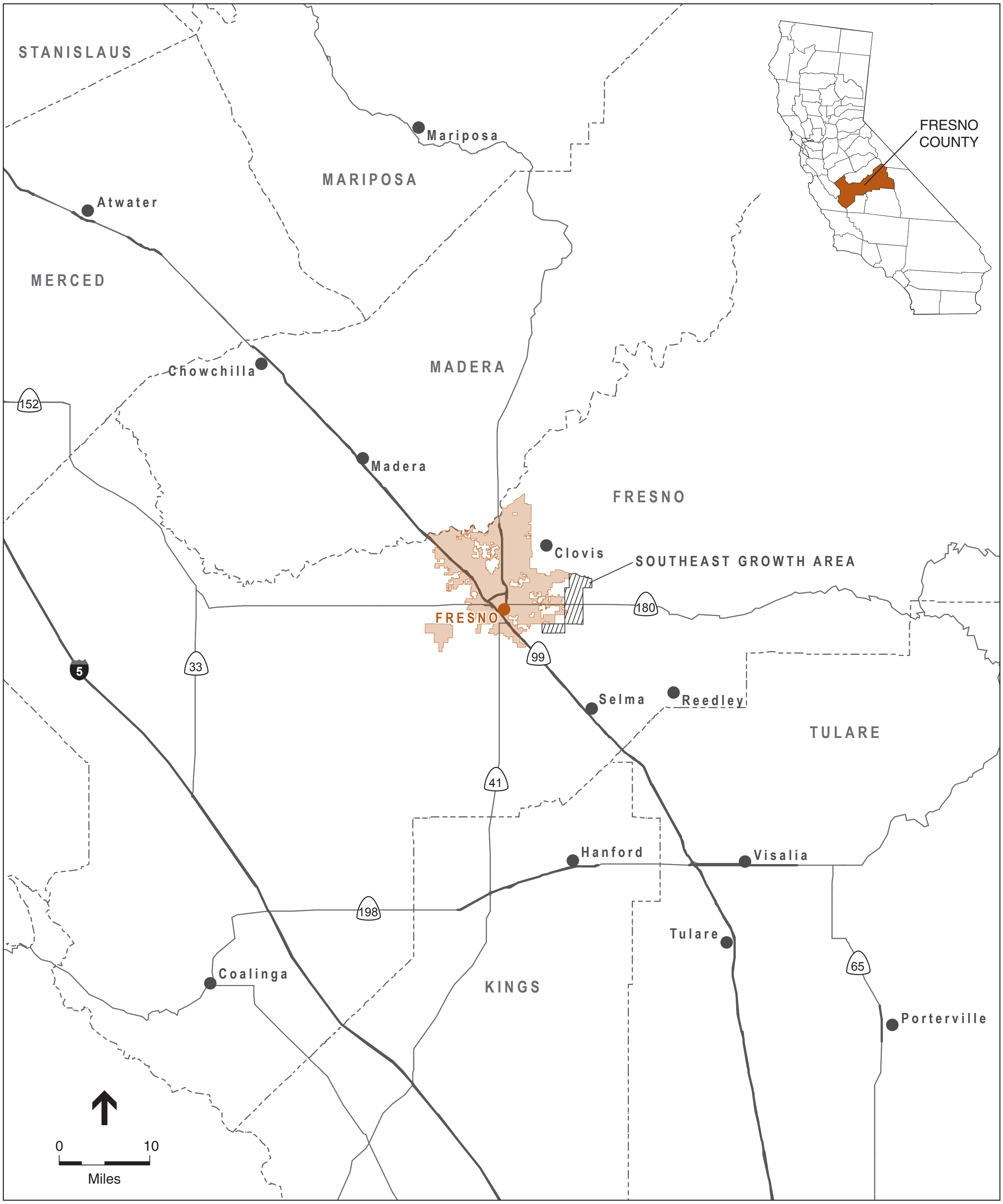
1.1 Introduction

The City of Fresno (City) proposes to adopt and implement the Fresno Metropolitan Water Resources Management Plan Update (Metro Plan Update or proposed project). The purpose of the Metro Plan Update is to update and refine the 1996 Fresno Metropolitan Water Resources Management Plan (1996 Metro Plan) taking into consideration available new data and accommodating physical and institutional changes which have occurred since the 1996 Metro Plan was prepared. The completed Metro Plan Update would facilitate future water resource decisions and utility planning, and would satisfy requirements for potential State funding. Implementation of the City of Fresno's (City) recommended water supply plan would result in a significant shift in the use of available water resources and an increase in diversity in the City's water supply portfolio which would enhance the City's overall water supply reliability. The proposed Metro Plan Update includes near-term projects and future projects including surface water treatment facilities, regional transmission facilities, groundwater facilities, potable water storage facilities, recycled water facilities, and water conservation measures. A detailed description of both the project specific elements and program level elements of Fresno Metro Plan Update is provided in Section 1.6 below.

The overall objective of the City Metro Plan Update is to provide sustainable and reliable water supplies to meet the demands of existing and future customers through buildout of the adopted general plan in effect at the time of approval of the EIR. The City is in process of updating the General Plan (2035 General Plan Update). The project area for the proposed Metro Plan Update includes the existing city limits and the City of Fresno Sphere of Influence (SOI) designated by the adopted 2025 General Plan. The boundaries designated by the proposed 2035 General Plan Update are consistent with those adopted in the 2025 General Plan; therefore, the proposed project area would not change. Because the City is in the process of updating its general plan, the EIR will analyze the project with regard to the adopted general plan in effect at the time of consideration of certification of the EIR.

1.2 Project Location

The City of Fresno is located in California's Central Valley in northern Fresno County primarily east of State Highway 99. The City is located approximately 170 miles south of the City of Sacramento and 220 miles northeast of the City of Los Angeles (see **Figure 1-1**). The Fresno-Clovis metropolitan area, with a current population of 1,002,046, is the second largest metropolitan area in the Central Valley after the Sacramento metropolitan area. The City is the county seat of Fresno County, the



SOURCE: DeLorme Street Atlas USA, 2000; and ESA, 2010

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Figure 1-1
Regional Location

fifth largest city in California, and currently encompasses approximately 110 square miles in geographic area. The project area for the Metro Plan Update includes the existing city limits and City of Fresno SOI. The project location and general project elements are shown in **Figures 1-1 through 1-3**, located at the end of Section 1.

1.3 Project Background

The Metro Plan Update would refine and bring up to date the 1996 Fresno Metropolitan Water Resources Management Plan (1996 Metro Plan)[1]. Over the past 12-plus years, population growth, land development and water use trends, institutional and regulatory issues, and other factors have shifted, motivating this planning effort. The engineers and planners tasked with preparing the Metro Plan Update have reviewed and evaluated a broad variety of water demand and facility information including new population projections, and physical and institutional changes which have occurred since 1996 and have identified the following changes:

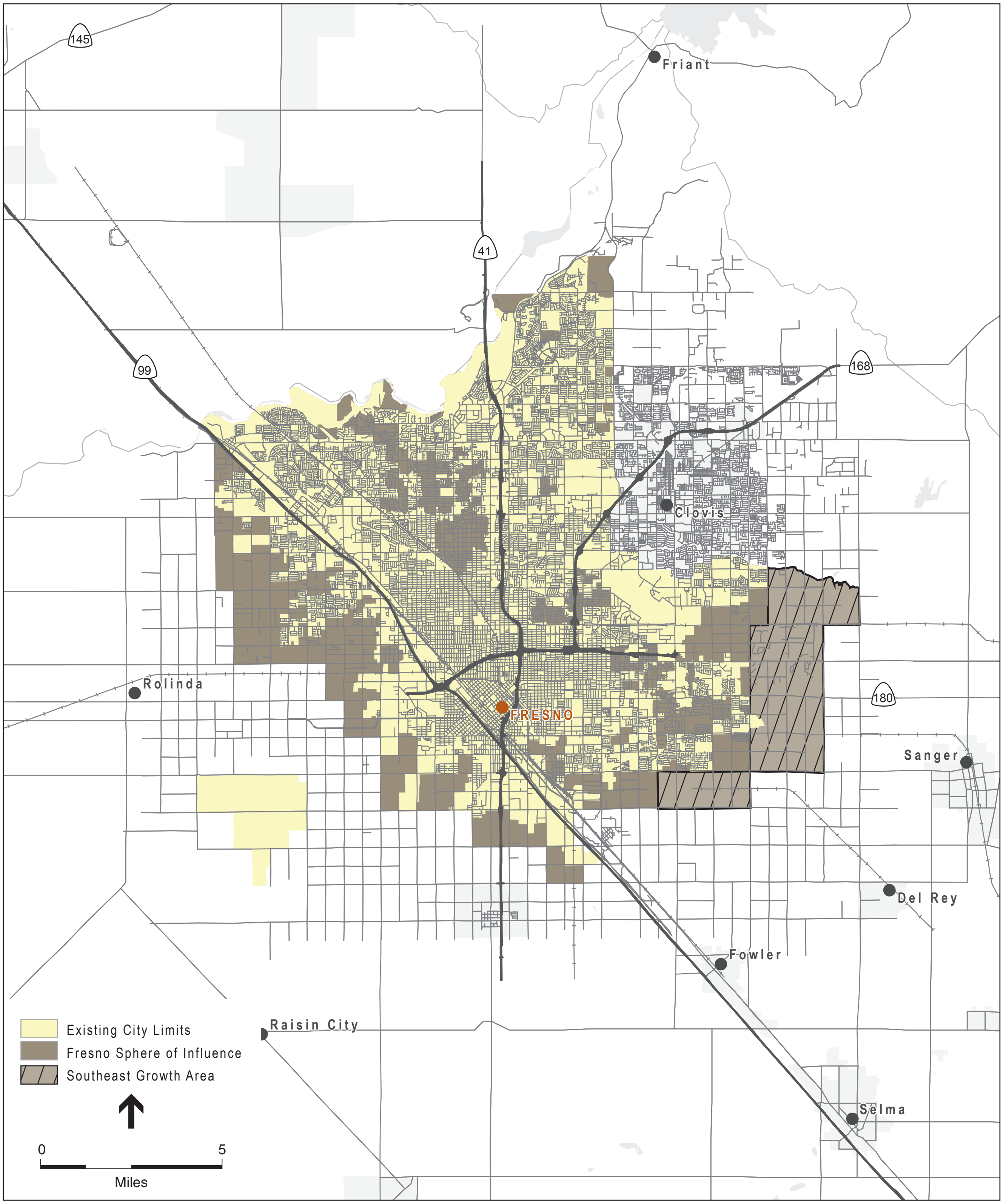
- **Growth in Water Demand.** Fresno's population and associated water demand grew faster than was projected in the 1996 Metro Plan Update.
- **Need for Additional Water System Facilities.** The existing water system infrastructure is inadequate to meet future demand. The City's predominant use of groundwater wells is no longer considered sustainable due to the declining water table, as a result of groundwater overdraft and degradation of water quality.
- **Refocused Study Area.** The 1996 Metro Plan evaluated the entire Fresno-Clovis metropolitan area. To meet the future needs and challenges of the City of Fresno, this Metro Plan Update is focused entirely on the City of Fresno and its defined SOI.

1.4 Existing Water Supply

The City of Fresno Water Division (Water Division) serves an estimated population of 514,090 (as of January 1, 2013) located in the City limits and Sphere of Influence (SOI). Areas not served by the Water Division within the SOI include areas served by: the Bakman Water Company (Bakman); Pinedale County Water District (Pinedale); Park Van Ness Mutual Water Company (Park Van Ness); California State University at Fresno (CSU Fresno); and private groundwater users located within County islands in the City SOI.

In 2012, the City met water demand by using 86 percent groundwater and 14 percent treated surface water. Prior to the 2004 opening of the City's Northeast (NE) Surface Water Treatment Facility (SWTF), groundwater accounted for 100 percent of water supplies. The following describes the existing groundwater and surface water supply sources.

[1] City of Fresno, *Fresno/Clovis 1996 Metropolitan Water Resources Management Plan.* Prepared by CH2M Hill.



SOURCE: ESRI, 2008; West Yost, 2009; City of Fresno, 2009; and ESA, 2009

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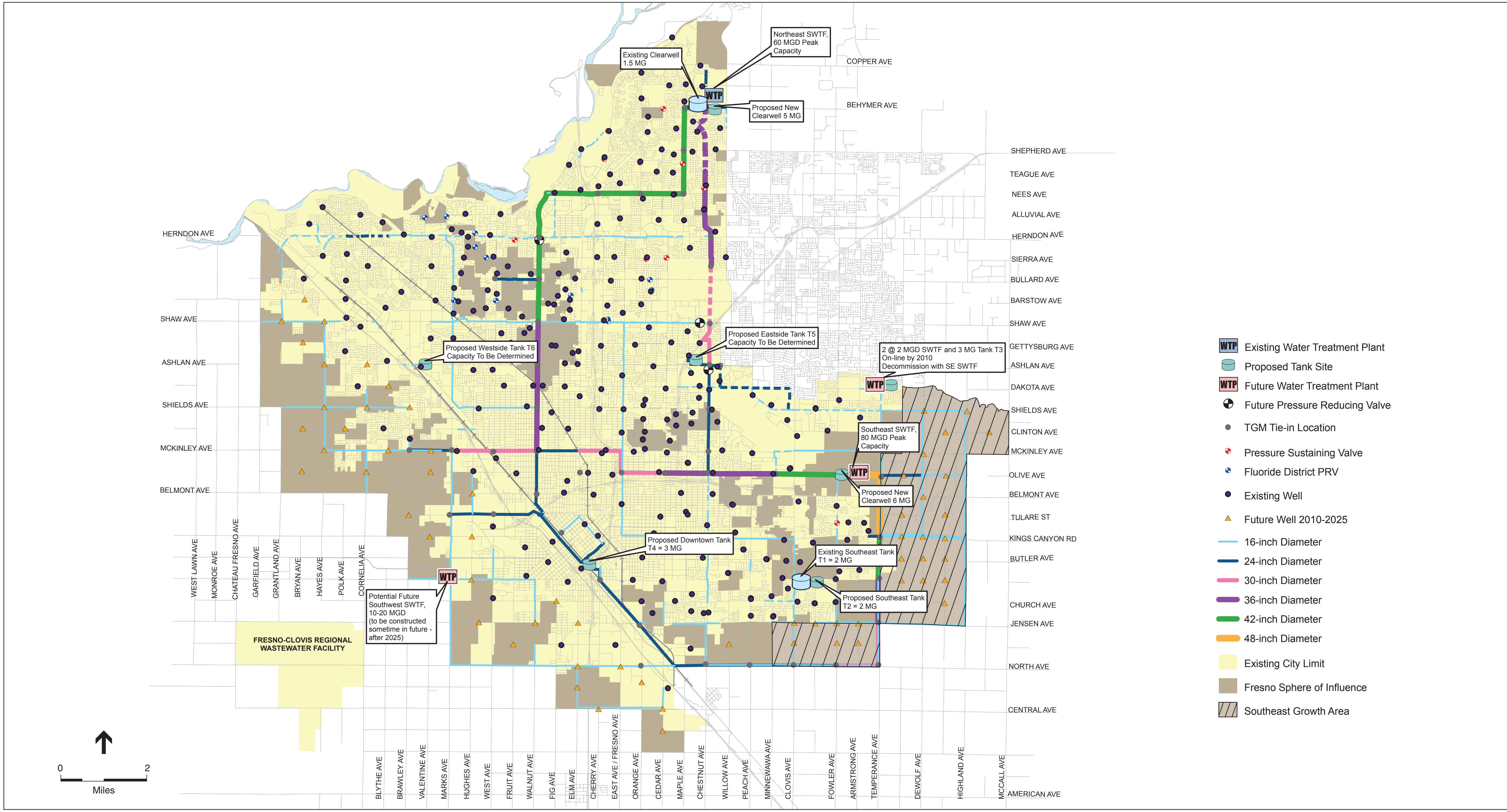
Figure 1-2
City of Fresno Project Area



SOURCE: City of Fresno, 2009; ESRI, 2009; West Yost, 2012; and ESA, 2012

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Figure 1-3
Proposed Project – Overview

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1.4.1 Groundwater

The City's groundwater supplies are extracted from the Kings Subbasin, which is a subbasin of the San Joaquin Valley Groundwater Basin (SJV Basin). The City currently operates approximately 270 municipal supply wells, and until late 2004, relied solely on pumped groundwater to meet water demands within its service area.

Groundwater levels in the Fresno area have declined by an average of about 1.5 feet per year since 1990. The slowest groundwater level declines (less than 0.5 feet per year) were generally observed in the southwestern portion of the City in the downtown area, while groundwater level declines were observed to increase to 1.0 foot per year northeast of the downtown area, and as high as 1.5 feet per year in the northern and southeastern (near the Fresno Air Terminal) portions of the City. The largest average annual groundwater level declines (3.0 feet per year) were observed in the northeastern area of the City, near the City of Clovis border.

1.4.2 Surface Water

The City of Fresno currently has three sources of surface water supplies:

- A contract with the Fresno Irrigation District (FID) for a portion of FID's water entitlement from the Kings River;
- A United States Bureau of Reclamation (USBR) contract; and
- The City's Wastewater Recycle Exchange Agreement with FID.

Some of these available surface water supplies are treated at the City's existing Northeast Surface Water Treatment Facility (SWTF) located in northeast Fresno and some are used for intentional groundwater recharge. The information below, included in the City's 2010 Urban Water Management Plan[2], indicates the amount of water available for diversion during "Normal Years". A normal year is a hydrologic year classification that averages "normal wet" and "normal dry" years based on available water data 1964 to 2002.

FID Contract

On May 25, 1976, the City signed a contract with the FID for delivery of the City's pro rata share of FID's water entitlements on the Kings River. The contract specifically excludes any of FID's Class 2 USBR entitlement and any water stored in Pine Flat Reservoir by FID. **Table 1-1** presents the FID Kings River water projected to be available to the City during normal years.

[2] City of Fresno, *City of Fresno Final 2010 Urban Water Management Plan.* Prepared by West Yost Associates. November 2012.

TABLE 1-1
FID KINGS RIVER DIVERSIONS PROJECTED TO BE AVAILABLE TO THE CITY FOR EACH HYDROLOGIC YEAR TYPE (ACRE FEET OR AF)

Classification	2015	2020	2025
Wet	126,400	139,100	151,800
Normal-wet	115,200	126,800	138,400
Normal	105,400	115,900	126,500
Normal-dry	96,500	106,200	115,800
Dry	86,600	95,300	104,000
Critical-high	62,800	69,100	75,400
Critical-low	54,600	60,100	65,600

a. In 2005, the City received 0 AF of water from FID.
b. In 2010, the City received 500 AF of water from FID.

USBR Contract

In December 2010, the City executed a permanent contract with the USBR authorized under Section 9(d) of the Reclamation Project Act of 1939 providing the City with a permanent supply of surface water supplies from the USBR. USBR oversees diversions from the San Joaquin River through the Friant-Kern Canal of the Central Valley Project (CVP). The USBR owns the Friant-Kern Canal and the Friant Water Authority maintains and operates the Friant Kern Canal. The City's total entitlement from the USBR is 60,000 acre-feet per year (af/yr) of Class 1 water.

USBR Class 1 water is generally water available from Millerton Lake, and is a very dependable water supply, regardless of the type of hydrologic water year. Class 2 water is generally any excess water available as determined by USBR, and is not considered as dependable as Class 1 water. The projected surface water available for the City to purchase from the USBR during each hydrologic year defined by the 2006 Settlement Agreement is summarized in **Table 1-2**. As shown in **Table 1-2**, the projected water supply from the USBR, during each hydrologic year type, does not change over time. Unlike the City's contract with FID, the entitlement the City has with the USBR is not tied to growth of the City's water service area.

TABLE 1-2
USBR ENTITLEMENT PROJECTED TO BE AVAILABLE TO THE CITY FOR EACH HYDROLOGIC YEAR TYPE (AF)

Classification	2015	2020	2025
Wet	60,000	60,000	60,000
Normal-wet	60,000	60,000	60,000
Normal	58,200	58,200	58,200
Normal-dry	56,200	56,200	56,200
Dry	39,200	39,200	39,200
Critical-high	25,200	25,200	25,200
Critical-low	13,900	13,900	13,900

a. In 2005, the City received 58,731 AF of water from USBR.
b. In 2010, the City received 71,959 AF of water from USBR.

Wastewater Recycle Exchange

In addition to the contracts with FID and the USBR, the City also has a contract with FID that allows the City to pump groundwater developed through the percolation of previously treated wastewater effluent. This percolated water is then extracted and pumped into FID canals for delivery to downstream customers.

In return, the agreement states that FID will provide the City with surface water from either its Kings River entitlement or its Class 2 USBR water "insofar as is feasible and practical." The quantity of surface water that FID is required to provide is limited to 46 percent of the groundwater that the City pumps into FID's delivery canal, and the contract limits the annual quantity that can be pumped into FID's canals to 30,000 af/yr or 100,000 AF over a 10 year period. Based on a 46 percent return from FID, the City is entitled to obtain 13,800 AF (or 46 percent of 30,000 af/yr) of Kings River water from FID during all hydrologic conditions. **Table 1-3** presents the exchange water projected to be available to the City.

TABLE 1-3
EXCHANGE WATER PROJECTED TO BE AVAILABLE TO THE CITY (AF)

Classification	2015	2020	2025
All Hydrologic Years (Wet, Normal-wet, Normal, Normal-dry, Dry, Critical-high and Critical-low)	13,800	13,800	13,800

a. In 2005, the City received no water from the wastewater recycle exchange.
b. In 2010, the City received no water from the wastewater recycle exchange.

1.4.3 Summary of Existing and Future Surface Water Supplies

Table 1-4 provides a summary of the City's estimated available existing and projected surface water supplies based on the information described above. As shown, the City's projected future surface water supplies in normal years are expected to increase to 198,500 af/yr by 2025 as the City's supply from the FID Kings River increases (as agricultural areas within FID's service area are annexed into the City).

TABLE 1-4
EXISTING AND FUTURE SURFACE WATER SUPPLIES PROJECTED TO BE AVAILABLE DURING NORMAL YEARS (AF)

Surface Water Supply	2015	2020	2025
FID Kings River	105,400	115,900	126,500
USBR	58,200	58,200	58,200
Recharge/Exchange Water	13,800	13,800	13,800
Total Surface Water Supply in Normal Years	177,400	187,900	198,500
Planned Future Surface Water Treatment Capacity [a, b]	30,800	123,400	123,400

a. The existing treatment capacity for the NE SWTF is 30 mgd (30,800 af/yr).
b. Planned future treatment capacity includes: constructing a new 80 million gallons per day (mgd) Southeast (SE) SWTF to be located in the southeast portion of the City beginning in spring of 2015 and completed by winter 2018; and expanding the existing NE SWTF from 30 mgd to 60 mgd about 2020. The proposed new Southwest (SW) SWTF is not included as it is anticipated to be constructed sometime after 2025. Annual treatment capacity assumes that the SWTFs are out of service for one month of the year for maintenance activities.

1.5 Project Objectives

The overall objective of the City's Metro Plan Update is to provide sustainable and reliable water supplies to meet the demand of existing and future customers through 2025. The overall goals are to:

- Maximize use of available surface water supplies for direct treatment and use, and intentional groundwater recharge;
- Balance the City's groundwater operations by 2025;
- Replenish groundwater basin storage when surplus surface water supplies are available;
- Continue to implement and expand demand management/water conservation measures in compliance with the City's United States Bureau of Reclamation (USBR) contract and to achieve specific water conservation goals; and
- Incorporate tertiary-treated recycled water into its future water supply portfolio to meet non-potable demands in new development areas and existing parts of the City.

1.6 Proposed Project Elements

The proposed Metro Plan Update includes near-term projects and future projects as shown in **Figure 1-3**. This section provides a summary of both near-term and future project elements proposed under the Metro Plan Update. **Table 1-5** summarizes proposed future surface water treatment capacity.

TABLE 1-5
PROPOSED FUTURE SURFACE WATER TREATMENT CAPACITY

Surface Water Treatment Facility	Design Capacity (Average Treatment Capacity)[a], mgd	Annual Production Capacity, af/yr
New SE SWTF (by 2018)	80 mgd (70 mgd)	72,000 af/yr
Existing NE SWTF		
Current Design Capacity	30 mgd	30,800 af/yr
Future Expansion (Additional 30 mgd) (by about 2020)	60 mgd (50 mgd)	51,400 af/yr
Future SW SWTF (by about 2025)	10 to 20 mgd	10,000 to 20,000 af/yr
Total Nominal Future SWTF Treatment and Production Capacity[b]	140 mgd (120 mgd)	123,400 af/yr

a. Average treatment capacity is based on an 11-month operations period each year to produce the required quantity of treated surface water for direct use.
b. Total does not include potential new SW SWTF, for which the timing and treatment capacity will be determined in the future.

Surface Water Treatment Facility and Storage Facilities

- Construction of a new SE SWTF with a design capacity of 80 mgd by winter 2018.
- Expansion of the existing NE SWTF from 30 mgd to 60 mgd (design capacity) around 2020.

- Future construction of a new SW SWTF (capacity of 10 to 20 mgd) in the southwestern part of the City to provide added flexibility for serving future demands in that portion of the City around 2025.
- New potable water storage facilities located at key locations in the City to provide operational flexibility during peak demand periods and provide emergency storage capacity.

Groundwater

- Reduction in annual groundwater use and maintenance of existing intentional groundwater recharge quantities to achieve and maintain balanced groundwater operations;
- Increased recharge capacity (20,500 af/yr additional) through the increased use of existing recharge facilities and construction and maintenance of new recharge facilities (approximately 340 acres of additional recharge area) to allow for increased recharge in years when surplus surface water is available to help restore groundwater levels to historical levels;
- Additional intentional groundwater recharge may be achieved through the construction of expanded or new recharge basins and/or the development of an Aquifer Storage and Recovery (ASR) Well System.

Recycled Water Supplies

A detailed City of Fresno Recycled Water Master Plan and EIR (SCH# 2010051015) was finalized by the City of Fresno in June of 2011. The Recycled Water Master Plan identifies potential recycled water use opportunities within the City and its SOI and includes a plan for the installation and operation of treatment, storage and distribution infrastructure to serve the City and SOI. In addition to the Master Plan, the City intends to consider the adoption of a “Recycled Water Ordinance” to assist the City in implementing the Recycled Water Master Plan. The purpose of the ordinance would be to establish water recycling policy and criteria for its use within the current City limits as well as its SOI as lands within the SOI are annexed into the City. More specifically, the Ordinance would contain provisions addressing various topics related to implementation of the goals, policies and objectives of the Master Plan.

A brief description of the topics discussed in the Recycled Water Master Plan is provided below. The Metro Plan Update will take into account the City’s anticipated future use of recycled water as part of its overall future water supply plan. However, the Metro Plan EIR will not re-analyze the construction and operation of specific recycled water facilities as they were adequately analyzed in the Recycled Water Master Plan EIR.

- Introduction of recycled water supply for landscape irrigation and other non-potable uses to offset potable water demands:
    - Use of North Fresno WRF to irrigate Copper River Golf Course (initially 750 af/yr, increasing to 1,000 af/yr by 2015)
    - Use of up to 25,000 af/yr of recycled water for landscape irrigation and other non-potable uses in new development areas and existing parts of the City by 2025 (highly treated recycled water to be produced at new satellite plants, stand-alone plants and/or an expanded Regional Wastewater Reclamation Facility (RWRF))

Water Conservation

- Water conservation measures including:
  - Completing residential water metering program (completed)
  - Implementing rebate programs for water conserving devices and systems
  - Implementing Commercial, Industrial, and Institutional water conservation programs
  - Joining the California Urban Water Conservation Council (CUWCC) and participating in informational and training workshops and jointly-funded water conservation programs
  - Enacting a Retrofit Upon Resale Ordinance
  - Implementing Turf Replacement Rebates ("Cash for Grass")
  - Developing a Landscape Water Audit and Budget Program
  - Developing a Prioritized Leak Detection Program
  - Conducting a Complete Water System Audit
  - Billing with Commodity Rates (and eventually Tiered Rates)

1.6.1 Near-term Project Elements

Proposed near-term elements for the Metro Plan Update are summarized in **Table 1-6**. These elements will be analyzed at a project level in the EIR.

TABLE 1-6
NEAR-TERM PROJECT ELEMENTS

Infrastructure Component	Description
Surface Water Treatment Facilities	New SE SWTF • New SWTF with total design capacity of 80 mgd and raw water intake and transmission pipeline to the facility • New clearwell (8 to 12 MG) • Potential relocation of the existing City Department of Public Utilities Water Division Administrative Offices and Corporation Yard (i.e. Water Yard) to the SE SWTF property Existing NE SWTF • Operational improvements to increase from current 27.5 mgd operational capacity to 30 mgd design capacity • Expansion of existing SWTF design capacity from 30 to 60 mgd • New 5.0 MG clearwell (in addition to existing 1.5 MG clearwell)
Potable Water Regional Transmission Facilities	Extensive new potable water transmission system pipelines to distribute treated surface water supplies from the SWTFs to customers: • Regional transmission main from proposed SE SWTF west in Olive Avenue, north in First Street, and west in McKinley Avenue or Belmont Avenue, then south in Palm Avenue • Regional transmission main from the proposed SE SWTF east in Olive Avenue, south in Temperance Avenue, and west in North Avenue connecting to a Downtown storage tank located near H Street and Santa Clara • Regional transmission main from proposed SE SWTF east in Olive Avenue to DeWolf Avenue to serve the proposed Southeast Growth Area

Each of the proposed near-term project elements is described in more detail below.

New 80 MGD SE SWTF

Based on the overall objective of providing a sustainable and reliable water supply for the City for the future, the Metro Plan Update recommends maximizing the use of available surface water supplies, balancing groundwater operations and replenishing groundwater storage to improve the reliability and diversity of the City's water supply portfolio. A new SE SWTF is proposed to help meet these objectives. The proposed SE SWTF site would be located on a 58-acre property at the northwest corner of Armstrong and Olive Avenues. Treated surface water supplies from the proposed new SE SWTF would serve existing and future customers in the southern part of the City's water service area within the City's SOI.

The proposed 80 mgd design capacity for the SE SWTF would allow the City to treat up to 72,000 af/yr of surface water supplies for direct use (based on an average treatment capacity of 70 mgd for 11 months of the year assuming a Mill Ditch raw water conveyance system), or approximately 89,600 af/yr assuming the full 80 mgd capacity for 12 months served via a raw water conveyance pipeline which is not associated with Mill Ditch. Based on the proposed location of the new SE SWTF, the source of the raw water supply for the new SE SWTF would be the Kings River, possibly delivered via FID's Mill Ditch. One possible intake location could be at the intersection of Armstrong Avenue and Mill Ditch, just north of the facility site. An alternative location is via an existing FID easement located along the western side of the SE SWTF site, which is diverting flows from Mill Ditch. And an alternative intake and buried raw water transmission pipeline located east of the SE SWTF site is also being considered. Based on the City's future water supply plan, it is estimated that construction of the 80 mgd SE SWTF would begin in spring of 2015 and that the facility would be operational by winter 2018.

Additional improvements at the SE SWTF include the potential relocation of the existing City Department of Public Utilities Water Division Administrative Offices and Corporation Yard (i.e. Water Yard) to the proposed SE SWTF and also the potential construction of a demonstration garden for water use and conservation education.

Operational Improvements and Expansion of the Existing NE SWTF

The City's existing NE SWTF has some operational constraints which prevent it from being operated at its full design capacity of 30 mgd. The current operational capacity is about 27.5 mgd. Some of the planned improvements for this site include, but are not limited to: increased clearwell storage capacity, re-rating filter flow capacities, and expanded equipment storage areas. The City is working on these improvements to allow for the operation of the NE SWTF at its full design capacity of 30 mgd. The Metro Plan Update proposes that this facility be expanded by 30 mgd to a total design capacity of 60 mgd and be operational in 2020. This proposed expansion would provide the City with the capability to treat a total of 51,400 af/yr for direct use from the NE SWTF based on an average treatment capacity of 50 mgd for 11 months of the year, consistent with the Metro Plan Update objective of maximizing the use of available surface water supplies to improve the reliability and diversity of the City's water supply portfolio.

Transmission System

A major north/south regional transmission system in Chestnut Avenue is proposed to connect the two treatment facilities. Part of this transmission system has already been constructed. Other major transmission mains (24-inch diameter to 48-inch diameter) would be located in North Maple Avenue, Nees Avenue, Olive Avenue, McKinley Avenue, North Avenue, G Street, Palm Avenue, Bullard Avenue, and Temperance Avenue, as shown on, as shown on **Figure 1-3**. A summary of the proposed regional transmission main system and transmission grid main (TGM) pipelines that would be needed to serve the 2025 SOI is presented in **Table 1-7**. Specific characteristics of the system include:

- No individual customer service taps on regional transmission system pipelines;
- Water to the TGM system would be provided from turnouts off the regional transmission system;
- The existing TGM system would be expanded and strengthened; and
- Water would be provided to the local distribution systems through a grid of 16-inch diameter TGM pipes.

TABLE 1-7
POTABLE WATER TRANSMISSION MAIN SUMMARY (THROUGH 2025)

Pipe Diameter, inches	Length, feet
48	12,900
42	59,100
36	47,100
30	39,200
24	107,500
16 (TGM)	506,200
Total	**772,000**

SOURCE: City of Fresno Metro Plan Phase 2, January 2011

1.6.2 Future Project Elements

Proposed future elements for the Metro Plan Update are summarized in **Table 1-8** below. These elements will be analyzed at a program level in the EIR and will require additional environmental analysis and documentation prior to construction and operation in order to be in compliance with CEQA.

TABLE 1-8
FUTURE PROJECT ELEMENTS

Infrastructure Component	Description
Surface Water Treatment Facilities	Future SW SWTF • 10 to 20 mgd

Potable Water Regional Transmission Facilities	• New potable water transmission and distribution system pipelines to distribute water supplies to customers.
	• To be designed and constructed by 2020
	  • Regional transmission main from NE SWTF along Palm Avenue to McKinley Avenue
	  • Northerly crossing beneath Highway 99 and railroad, along McKinley Avenue.
	  • Other new water facilities including pump stations, groundwater wells

Potable Water Storage Facilities	New potable water storage facilities located at key locations in the City to provide operational flexibility during peak demand periods and provide emergency storage capacity • New clearwells at NE and SE SWTFs • New Eastside Tank "T5" (assumed to be 4 million gallons) (possibly near Chestnut Avenue and Ashlan Avenue) • New Westside Tank "T6" (assumed to be 4 million gallons) (near Highway 99 at Ashlan Avenue)
Groundwater Facilities	• 65 new wells by 2025 • Groundwater treatment systems on new wells as needed to address organic and inorganic water quality contaminants, as well as potential upcoming State and Federal regulations • Expanded existing groundwater recharge basins and/or new groundwater recharge basins/areas (340 acres of additional recharge area; 425 acres total including roadways and setbacks) to increase intentional groundwater recharge capabilities, particularly in years when surplus surface water supplies are available for recharge • Potential Aquifer Storage and Recovery (ASR) System for groundwater injection and extraction in lieu of or in addition to new recharge basins
Recycled Water Facilities (City of Fresno Recycled Water Master Plan)	• Improvements to the existing Regional Wastewater Reclamation Facility (RWRF) and construction of satellite and/or stand-alone Wastewater Treatment Plants (WWTP) to produce tertiary treated recycled water for non-potable uses including landscape irrigation to offset potable water demands [a] • Recycled water storage facilities to serve peak demands [a] • Extensive new recycled water transmission and distribution system pipelines to distribute recycled water supplies from the RWRF/WWTPs to customers [a]
Water Conservation	• Implement a tiered water rate structure as soon as possible to further encourage water conservation; • Require new development to offset a portion of their required supply needs by implementing conservation measures (anticipated to provide a five percent demand reduction); • Establish aggressive water conservation goals/policies for new construction; • Establish more efficient exterior water use goals/policies for existing users including water conservation measures specifically geared towards reducing water use for landscape and turf irrigation; • Provide additional staff and program-specific financial resources required to implement and manage conservation programs (e.g., grant writer, CII conservation representative); • Maintain compliance with CVP Contract including the Best Management Practices (BMP) requirements; and • Update the City's Urban Water Management Plan (UWMP) every five years per State requirements.

a. These facilities have undergone environmental review and will not be evaluated in the Metro Plan Update EIR.

1.7 Schedule

The estimated implementation schedule for both near-term and future projects of the proposed Metro Plan Update is shown in **Table 1-9**. The timing of the individual infrastructure components of the Metro Plan Update will ultimately depend on the need for additional water supply capacity and the availability of funding.

TABLE 1-9
PROPOSED SCHEDULE FOR IMPLEMENTATION OF THE METRO PLAN UPDATE

Infrastructure Component	Construction Period
Surface Water Treatment Facilities	• 2015-2018: 80 mgd SE SWTF • About 2020: Expanded (60 mgd) NE SWTF • About 2025: New SW SWTF
Potable Water Transmission Facilities	• 2014-2018: Major transmission pipelines to distribute treated water from new SE SWTF • 2016-2020: Major transmission pipelines to distribute treated water from expanded NE SWTF • About 2025: Major transmission pipelines to distribute treated water from new SW SWTF
Potable Water Storage Facilities	• 2015-2025
Groundwater Facilities	• 2014-2025: New wells, wellhead treatment, groundwater storage/recharge facilities
Recycled Water Facilities (Recycled Water Master Plan)	• 2015-2025: Recycled water treatment and distribution facilities (treatment and distribution)
Water Conservation	• 2014-2025: Implement additional water conservation measures to reduce water use

1.8 CEQA Process

The EIR will be prepared in compliance with California Environmental Quality Act (CEQA), Public Resources Code Sec 21000 et seq., and the CEQA Guidelines, as amended. The City will be the lead agency for the CEQA process. In accordance with CEQA, the lead agency has the responsibility for the scope, content, and legal adequacy of the document.

A Notice of Preparation (NOP) as required by CEQA will be sent to interested agencies to solicit their comments on the project. The NOP will include a project description, location of the project, alternatives, possible environmental impacts, and the date and time of known future meetings on the project. The scoping meeting(s) will provide other agencies the opportunity to bring to the attention of the lead agencies significant issues that should be included in the EIR. Agencies will have 30 days to tender their comments.

The draft EIR will incorporate public concerns associated with the project alternatives identified in the scoping process and will be distributed for at least 45-day public review and comment period. During this time, both written and verbal comments will be solicited on the adequacy of the document. The final EIR will address the comments received on the draft during public review and will be made available to all commenters on the draft EIR and anyone requesting a copy during the 45-day public review period. The final EIR will (1) provide a full and fair discussion of the proposed actions significant environmental impacts, and (2) inform the decision-makers and the public of reasonable measures and alternatives that would avoid or minimize adverse impacts or enhance the quality of the environment.

The final step in the EIR process is certification of the EIR, which includes preparation of a Mitigation Monitoring and Reporting Plan and adoption of its findings, should the project be approved. A certified EIR indicates the following: (1) The document complies with CEQA; (2) the decision-making body of the lead agency reviewed and considered the final EIR prior to approving the project; and (3) the final EIR reflects the lead agency's independent judgment and analysis. In addition, a Notice of Determination (NOD) describing the project, its impacts and adopted mitigation, the environmental findings of the agency, and the location of copies for examination is filed with the Fresno County Clerk.

1.9 Regulatory Requirements, Permits and Approvals

In addition to meeting CEQA requirements, proposed project(s) will be required to obtain federal, state and local permits and regulatory approvals. It is possible that construction projects to be implemented as part of the Metro Plan Update could require, depending upon the environmental resources identified on or near project sites and water pipeline alignments, authorization from the following agencies:

- Federal –U.S. Army Corps of Engineers (wetlands), U.S. Fish and Wildlife Service (terrestrial species), and National Marine Fisheries Service (aquatic species)
- State –Central Valley Regional Water Quality Control Board (water quality certificate), California Department of Fish and Wildlife (streambed alteration permit), Central Valley Flood Protection Board (floodplains), California Department of Transportation (highway crossings), California Department of Conservation (important farmlands), San Joaquin Valley Unified Air Pollution Control District, and potentially the California Native American Heritage Commission and the State Office of Historic Preservation
- Local – Fresno County and special districts
- City of Fresno – entitlements, such as a Conditional Use Permit, for water facilities

Additional approvals for project construction and operation would also be required for implementation of all the project alternatives. The approvals listed below are considered distinct from permits because they are not required by resource agencies for protection of natural and cultural resources. Examples of approvals, possibly using eminent domain for purchase of land or easements, that would need to be negotiated include:

- Temporary construction easements along and across local roadways – public and private property owners along pipeline alignments
- Temporary right-of-way borings – California Department of Transportation, Union Pacific Railroad company, Fresno County
- Operational agreements – FID and FMFCD
- Acquisition of land and utility rights-of-way through purchase or condemnation, if necessary

The agencies and organizations responsible for issuing project approvals would consider the information presented in the EIR during their deliberations.

Appendix B
Notice of Preparation Comment Letters

October 14, 2013

Brock Buche
City of Fresno
Department of Public Utilities, Water Division
1910 East University Avenue
Fresno, CA 93703-2988

Project: Notice of Preparation of a Draft Environmental Impact Report for the Fresno Metropolitan Water Resources Management Plan Update

District CEQA Reference No: 20130790

Dear Mr. Buche:

The San Joaquin Valley Unified Air Pollution Control District (District) has reviewed the Notice of Preparation (NOP) for the Fresno Metropolitan Water Resources Management Plan Update (Metro Plan) project. The proposed project consists of updating and refining the 1996 Metro Plan taking into consideration available new data and accommodating physical and institutional changes which have occurred since the 1996 Metro Plan was prepared. The Metro Plan Update includes near-term project elements and future project elements. The near term project elements consists of surface water treatment facilities and potable water regional transmission facilities. The future project elements consists of surface water treatment facilities, potable water regional transmission facilities, potable water storage facilities, groundwater facilities, recycled water facilities, and water conservation. The District offers the following comments:

Emissions Analysis

1) The District is currently designated as extreme nonattainment for the 8-hour ozone standard, attainment for PM10 and CO, and nonattainment for PM2.5 for the federal air quality standards. At the state level, the District is designated as nonattainment for the 8-hour ozone, PM10, and PM2.5 air quality standards. The District recommends that the Air Quality section of the Environmental Impact Report (EIR) include a discussion of the following impacts:

   a) **Criteria Pollutants:** Project related criteria pollutant emissions should be identified and quantified. The discussion should include existing and post-project emissions.

i) Construction Emissions: Construction emissions are short-term emissions and should be evaluated separate from operational emissions. The District recommends preparation of an Environmental Impact Report (EIR) if annual construction emissions cannot be reduced or mitigated to below the following levels of significance: 10 tons per year of oxides of nitrogen (NOx), 10 tons per year of reactive organic gases (ROG), or 15 tons per year particulate matter of 10 microns or less in size (PM10).

- *Recommended Mitigation:* To reduce impacts from construction related exhaust emissions, the District recommends feasible mitigation for the project to utilize off-road construction fleets that can achieve fleet average emissions equal to or cleaner than the Tier II emission standards, as set forth in §2423 of Title 13 of the California Code of Regulations, and Part 89 of Title 40 Code of Federal Regulations. This can be achieved through any combination of uncontrolled engines and engines complying with Tier II and above engine standards.

ii) Operational Emissions: Permitted (stationary sources) and non-permitted (mobile sources) sources should be analyzed separately. The District recommends preparation of an Environmental Impact Report (EIR) if the sum of annual permitted and non-permitted emissions cannot be reduced or mitigated to below the following levels of significance: 10 tons per year of oxides of nitrogen (NOx), 10 tons per year of reactive organic gases (ROG), or 15 tons per year particulate matter of 10 microns or less in size (PM10).

iii) Recommended Model: Project related criteria pollutant emissions should be identified and quantified. Emissions analysis should be performed using CalEEMod (**Cal**ifornia **E**mission **E**stimator **Mod**el), which uses the most recent approved version of relevant Air Resources Board (ARB) emissions models and emission factors. CalEEMod is available to the public and can be downloaded from the CalEEMod website at: www.caleemod.com.

b) **Nuisance Odors:** The project should be evaluated to determine the likelihood that the project would result in nuisance odors. Nuisance orders are subjective, thus the District has not established thresholds of significance for nuisance odors. Nuisance odors may be assessed qualitatively taking into consideration of project design elements and proximity to off-site receptors that potentially would be exposed objectionable odors.

c) **Health Impacts:** Project related health impacts should be evaluated to determine if emissions of toxic air contaminants (TAC) will pose a significant health risk to nearby sensitive receptors. TACs are defined as air pollutants that which may cause or contribute to an increase in mortality or serious illness, or which may pose a hazard to human health. The most common source of TACs can be attributed to diesel exhaust fumes that are emitted from both stationary and mobile sources. Health impacts may require a detailed health risk assessment (HRA).

Prior to conducting an HRA, an applicant may perform a prioritization on all sources of emissions to determine if it is necessary to conduct an HRA. A prioritization is a screening tool used to identify projects that may have significant health impacts. If the project has a prioritization score of 1.0 or more, the project has the potential to exceed the District's significance threshold for health impacts of 10 in a million and an HRA should be performed.

If an HRA is to be performed, it is recommended that the project proponent contact the District to review the proposed modeling approach. The project would be considered to have a significant health risk if the HRA demonstrates that project related health impacts would exceed the District's significance threshold of 10 in a million.

More information on TACs, prioritizations and HRAs can be obtained by:

- E-mailing inquiries to: hramodeler@valleyair.org; or
- Visiting the District's website at:

  http://www.valleyair.org/busind/pto/Tox_Resources/AirQualityMonitoring.htm.

2) In addition to the discussions on potential impacts identified above, the District recommends the EIR also include the following discussions:

   a) A discussion of the methodology, model assumptions, inputs and results used in characterizing the project's impact on air quality. To comply with CEQA requirements for full disclosure, the District recommends that the modeling outputs be provided as appendices to the EIR. The District further recommends that the District be provided with an electronic copy of all input and output files for all modeling.

   b) A discussion of the components and phases of the project and the associated emission projections, including ongoing emissions from each previous phase.

   c) A discussion of project design elements and mitigation measures, including characterization of the effectiveness of each mitigation measure incorporated into the project.

   d) A discussion of whether the project would result in a cumulatively considerable net increase of any criteria pollutant or precursor for which the San Joaquin Valley Air Basin is in non-attainment. More information on the District's attainment status can be found online by visiting the District's website at:

      http://valleyair.org/aqinfo/attainment.htm.

<u>District Rules and Regulations</u>

3) The proposed project may be subject to District rules and regulations, including: Regulation VIII (Fugitive PM10 Prohibitions), Rule 4102 (Nuisance), and Rule 4641 (Cutback, Slow Cure, and Emulsified Asphalt, Paving and Maintenance Operations). In the event an existing building will be renovated, partially demolished or removed, the

project may be subject to District Rule 4002 (National Emission Standards for Hazardous Air Pollutants).

4) This project may be subject to District Rule 2010 (Permits Required) and Rule 2201 (New and Modified Stationary Source Review) and may require District permits. Prior to the start of construction, the project proponent should contact the District's Small Business Assistance (SBA) Office at (559) 230-5888 to determine if an Authority to Construct (ATC) permit application is required.

5) Based on information provided, the near-term and future project elements within the proposed Metro Plan Update project may equal or exceed the relevant District Rule 9510 (Indirect Source Review) applicability threshold of 9,000 square feet. Therefore, the District concludes that the proposed project may be subject to District Rule 9510.

   Any applicant subject to District Rule 9510 is required to submit an Air Impact Assessment (AIA) application to the District no later than applying for final discretionary approval, and to pay any applicable off-site mitigation fees before issuance of the first building permit. If approval of the subject project constitutes the last discretionary approval by your agency, the District recommends that demonstration of compliance with District Rule 9510, including payment of all applicable fees before issuance of the first building permit, be made a condition of project approval. Information about how to comply with District Rule 9510 can be found online at: http://www.valleyair.org/ISR/ISRHome.htm.

6) The above list of rules is neither exhaustive nor exclusive. To identify other District rules or regulations that apply to this project or to obtain information about District permit requirements, the applicant is strongly encouraged to contact the District's Small Business Assistance (SBA) Office at (559) 230-5888. Current District rules can be found at the District's website at: www.valleyair.org/rules/1ruleslist.htm.

The District recommends that a copy of the District's comments be provided to the project proponent. If you have any questions or require further information, please call Sharla Yang at (559) 230-5934.

Sincerely,

David Warner
Director of Permit Services

Sharla Yang

For Arnaud Marjollet
Permit Services Manager

DW: sy

cc: File

STATE OF CALIFORNIA – CALIFORNIA NATURAL RESOURCES AGENCY **EDMUND G. BROWN JR., GOVERNOR**

CENTRAL VALLEY FLOOD PROTECTION BOARD
3310 El Camino Ave., Rm. 151
SACRAMENTO, CA 95821
(916) 574-0609 FAX: (916) 574-0682
PERMITS: (916) 574-2380 FAX: (916) 574-0682

September 19, 2013

Mr. Brock Buche
City of Fresno
1910 East University Avenue
Fresno, California 93703-2988

Subject: Fresno Metropolitan Water Resources Management Plan
SCH Number: 2013091021
Document Type: Notice of Preparation

Dear Mr. Buche:

Staff of the Central Valley Flood Protection Board (Board) has reviewed the subject document and provides the following comments:

The proposed plan should identify the Cresent Bypass, Dry Creek, Dog Creek, Globe Slough, Fresno Slough, Five Mile Slough, Kings River, James Bypass, Lower San Joaquin Flood Control Project, Sand Creek, and the San Joaquin River (i.e. Friant Dam to west end of Sherman Island) as being within the jurisdiction of the Central Valley Flood Protection Board. The Board is required to enforce standards for the construction, maintenance, and protection of adopted flood control plans that will protect public lands from floods. The jurisdiction of the Board includes the Central Valley, including all tributaries and distributaries of the Sacramento River, the San Joaquin River, and designated floodways (Title 23 California Code of Regulations (CCR), Section 2).

A Board permit is required prior to starting the work within the Board's jurisdiction for the following:

- The placement, construction, reconstruction, removal, or abandonment of any landscaping, culvert, bridge, conduit, fence, projection, fill, embankment, building, structure, obstruction, encroachment, excavation, the planting, or removal of vegetation, and any repair or maintenance that involves cutting into the levee (CCR Section 6);

- Existing structures that predate permitting, or where it is necessary to establish the conditions normally imposed by permitting. The circumstances include those where responsibility for the encroachment has not been clearly established or ownership and use have been revised (CCR Section 6);

- Vegetation plantings will require the submission of detailed design drawings; identification of vegetation type; plant and tree names (i.e. common name and scientific name); total number of each type of plant and tree; planting spacing and irrigation method that will be utilized within the project area; a complete vegetative management plan for maintenance to prevent the interference with flood control, levee maintenance, inspection, and flood fight procedures (CCR Section 131).

Vegetation requirements in accordance with Title 23, Section 131 (c) states "Vegetation must not interfere with the integrity of the adopted plan of flood control, or interfere with maintenance, inspection, and flood fight procedures."

The accumulation and establishment of woody vegetation that is not managed has a negative impact on channel capacity and increases the potential for levee over-topping. When a channel develops vegetation that then becomes habitat for wildlife, maintenance to initial baseline conditions becomes more difficult as the removal of vegetative growth is subject to federal and State agency requirements for on-site mitigation within the floodway. The project should include mitigation measures to avoid decreasing floodway channel capacity.

Hydraulic Impacts - Hydraulic impacts due to encroachments could impede flood flows, reroute flood flows, and/or increase sediment accumulation. The project should include mitigation measures for channel and levee improvements and maintenance to prevent and/or reduce hydraulic impacts. Off-site mitigation outside of the State Plan of Flood Control should be used when mitigating for vegetation removed within the project location.

The permit application and Title 23 CCR can be found on the Central Valley Flood Protection Board's website at http://www.cvfpb.ca.gov/. Contact your local, federal and State agencies, as other permits may apply.

The Board's jurisdiction, including all tributaries and distributaries of the Sacramento River and the San Joaquin River, and designated floodways can be viewed on the Central Valley Flood Protection Board's website at http://gis.bam.water.ca.gov/bam/.

If you have any questions, please contact me by phone at (916) 574-0651, or via e-mail at James.Herota@water.ca.gov.

Sincerely,

James Herota
Staff Environmental Scientist
Projects and Environmental Branch

cc: Governor's Office of Planning and Research
State Clearinghouse
1400 Tenth Street, Room 121
Sacramento, California 95814

STATE OF CALIFORNIA
CALIFORNIA NATURAL RESOURCES AGENCY
CENTRAL VALLEY FLOOD PROTECTION BOARD
3310 EL CAMINO AVENUE, ROOM 151
SACRAMENTO, CA 95821

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Mr. Brock Buche
City of Fresno
1910 East University Avenue
Fresno, California 93703-2988

REC'D SEP 30 2013

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STATE OF CALIFORNIA—CALIFORNIA STATE TRANSPORTATION AGENCY
EDMUND G. BROWN Jr., Governor

DEPARTMENT OF TRANSPORTATION
DISTRICT 6
1352 WEST OLIVE AVENUE
P.O. BOX 12616
FRESNO, CA 93778-2616
PHONE (559) 488-7307
FAX (559) 488-4088
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September 24, 2013

2131-IGR/CEQA
6-FRE-GEN
NOP DRAFT EIR
FRESNO METRO WATER RESOURCES
MANAGEMENT PLAN UPDATE
SCH #2013091021

Mr. Brock Buche
City of Fresno
1910 East University Avenue
Fresno, CA 93703-2988

Dear Mr. Buche:

We have completed our review of the notice of preparation for the draft Environmental Impact Report for the Fresno Metropolitan Water Resources Management Plan Update. The plan is to supply sufficient and reliable water supplies to meet the demands of existing and future customers through build-out of the applicable Fresno General Plan. The study area includes the existing city limits and the City of Fresno Sphere of Influence (SOI) areas designated by the 2025 Fresno General Plan. Caltrans has the following comments:

Caltrans has no comments or concerns regarding the notice of preparation for the draft Environmental Impact Report.

If you have any further questions or concerns, please feel free to contact me at (559) 488-7307 or via email jennifer.bryan-sanchez@dot.ca.gov.

Sincerely,

JENNIFER BRYAN-SANCHEZ
Office of Transportation Planning
District 06

Cc: State Clearing House

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
DISTRICT 6
P.O. BOX 12616
FRESNO, CA 93779

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Mr. Brock Buche
City of Fresno
1910 East University Avenue
Fresno, CA 93703-2988

REC'D SEP 30 2013

93703298899

OFFICE OF
FRESNO IRRIGATION DISTRICT

TELEPHONE (559) 233-7161
FAX (559) 233-8227
2907 S. MAPLE AVENUE
FRESNO, CALIFORNIA 93725-2208

YOUR MOST VALUABLE RESOURCE - WATER

October 11, 2013

Mr. Brock D. Buche
Dept. of Public Utilities, Water Division
City of Fresno
1910 East University Avenue
Fresno, CA 93703

Re: City of Fresno Metropolitan Water Resources Management Plan Update
Notice of Preparation of a Draft Environmental Impact Report

Dear Mr. Buche:

Thank you for the opportunity to review and comment on the City of Fresno's (City) Notice of Preparation of a Draft Environmental Impact Report (DEIR) for the City's Metropolitan Water Resources Management Plan (Metro Plan). The City has requested comments as to the scope and content of the environmental information and analysis that should be contained in the DEIR.

The overall objective of the City's Metro Plan is to supply sufficient and reliable water supplies to meet the demands of existing and future customers through buildout of the applicable Fresno General Plan.

Due to time constraints, our comments of the scope of the DEIR are very limited; however, we appreciate your consideration of the following comments:

1. The Metro Plan recognizes the conveyance agreement between the Fresno Irrigation District (FID) and the City as an important source of water supply. However, it should be recognized that the water supplies that the City proposes to use in the future are already being used within the FID service area. The additional water that the City will use is not a new supply to the area within FID. There is no net change of water use within the FID service or within the groundwater basin shared by the City and FID. The call of the water supply by the City will reduce surface water deliveries to other parts within FID and will more than likely not result in a change to the overall groundwater

levels. If benefits within the City's footprint are discussed in the DEIR, then the impacts to the rest of the FID service area must also be discussed.

2. The water resources of FID and the City are both contractually and physically connected, so changes within or by one of the entities could adversely affect the other. We encourage the City to manage its consumption of water resources to the maximum extent possible and to be mindful of the terms and conditions of any existing agreements for water supplies. If compliance with the existing agreements is not desired, then the impacts should be evaluated.

3. The Metro Plan references in several locations recharge of the groundwater basin by seepage from major canals. This contribution to the groundwater aquifer was estimated by WRIME. It is not clear how accurate this estimate is, but it should be noted that the urbanization of agricultural lands and the piping of open channels could adversely affect the amount recharged. These impacts must be analyzed.

4. The Metro Plan calls for the construction of a new surface water treatment facility located in the southeast area of the City. The proposed plant will have a significant water demand and increase in conveyance capacity and duration of delivery. The potential operational impacts must be evaluated.

5. We have been unaware of any future surface water treatment facilities in the southwest area of the City. This project is proposed as a future project to be analyzed at a program level in the DEIR and will require additional environmental analysis. Proper environmental analysis must be performed when more detail information is available.

6. The volume of water potentially to be recharged by new recharge facilities is significant. It has not been fully determined whether conveyance capacity exists for the additional requirements. FID ensures capacity for a minimum of 0.39 feet per month to the specific parcel. It should also be noted that FID's average water delivery period is six months per year. The operational and maintenance requirements of the conveyance system may be adversely affected by the volume of water and length of time water is conveyed to the recharge facilities subject to what assumptions the City uses.

7. The amount of land needed for new recharge facilities is significant. It is not clear whether the properties needed for recharge facilities will be purchased as part of land development or whether the City plans to

acquire agricultural lands in advance of land development. The potential impacts to agriculture as well as the inducement of growth should be considered and evaluated to minimize impacts to agriculture.

8. The District provided comments on each of the phases of the City's Metro Plan. Those comments should be considered in the evaluation of environmental impacts. If additional copies are needed, we can provide them to you.

9. Section 1.9 of the Notice lists regulatory requirements, permits, and approvals that will need to be obtained. For potable water, it would seem that the California Department of Public Health should also be listed.

It is evident that the development of this plan has been a significant undertaking by the City. We applaud the City's effort to develop this plan and memorialize the goals needed to be achieved in order for the City to responsibly plan growth. We are supportive of the City's direction to balance the groundwater levels under the City's sphere-of-influence and encourage the City to carefully, but vigorously implement the plan so that it can successfully achieve its goals without causing adverse impacts to other parties or the environment.

We believe that this analysis is long overdue and appreciate the City staffs' effort to undertake this task. We look forward to the City's consideration of our comments and analysis within the DEIR. Should you have any questions, please do not hesitate to call me at (559) 233-7161 x-7103.

Sincerely,

Laurence Kimura
Assistant General Manager

cc: Patrick Wiemiller, Public Utilities Director, City of Fresno
Gary R. Serrato, Fresno Irrigation District
Bill Stretch, Fresno Irrigation District

H:\Fresno, City of\Fresno Metro WRMP Update-NOP-comments-2013-1011.docx

STATE OF CALIFORNIA Edmund G. Brown, Jr.,, *Govemor*

NATIVE AMERICAN HERITAGE COMMISSION
1550 Harbor Boulevard
West Sacramento, CA 95691
(916) 373-3715
(916) 373-5471 – FAX
e-mail: ds_nahc@pacbell.net

September 10, 3013

Mr. Brock Buche
City of Fresno
1910 East University Avenue
Fresno, CA 93703-2988

RE: SCH#2013091021 CEQA Notice of Preparation (NOP); draft Environmental Impact Report (DEIR) for the **"Fresno Metropolitan Water Resources Management Plan Update;"** located in the City of Fresno; Fresno County, California

Dear Mr. Buche:

The Native American Heritage Commission (NAHC) has reviewed the CEQA Notice regarding the above referenced project. In the 1985 Appellate Court decision (170 Cal App 3rd 604), the court held that the NAHC has jurisdiction and special expertise, as a state agency, over affected Native American resources impacted by proposed projects, including archaeological places of religious significance to Native Americans, and to Native American burial sites.

The California Environmental Quality Act (CEQA) states that any project which includes archeological resources, is a significant effect requiring the preparation of an EIR (CEQA guidelines 15064.5(b). To adequately comply with this provision and mitigate project-related impacts on archaeological resources, the Commission recommends the following actions be required:

Contact the appropriate Information Center for a record search to determine :If a part or all of the area of project effect (APE) has been previously surveyed for cultural places(s), The NAHC recommends that known traditional cultural resources recorded on or adjacent to the APE be listed in the draft Environmental Impact Report (DEIR).

If an additional archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey. We suggest that this be coordinated with the NAHC, if possible. This area is known to the NAHC to be very culturally sensitive. The final report containing site forms, site significance, and mitigation measurers should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum, and not be made available for pubic disclosure pursuant to California Government Code Section 6254.10.

A list of appropriate Native American Contacts for consultation concerning the project site has been provided and is attached to this letter to determine if the proposed active might impinge on any cultural resources. Lack of surface evidence of archeological resources does not preclude their subsurface existence.

Lead agencies should include in their mitigation plan provisions for the identification and evaluation of accidentally discovered archeological resources, pursuant to California Health & Safety Code Section 7050.5 and California Environmental Quality Act (CEQA) §15064.5(f). In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American, with knowledge in cultural resources, should monitor all ground-disturbing activities. Also, California Public Resources Code Section 21083.2 require documentation and analysis of archaeological items that meet the standard in Section 15064.5 (a)(b)(f). Lead agencies should include in their mitigation plan provisions for the disposition of recovered artifacts, in consultation with culturally affiliated Native Americans. Lead agencies should include provisions for discovery of Native American human remains in their mitigation plan. Health and Safety Code §7050.5, CEQA §15064.5(e), and Public Resources Code §5097.98 mandates the process to be followed in the event of an accidental discovery of any human remains in a location other than a dedicated cemetery.

Sincerely,

Dave Singleton
Program Analyst

CC: State Clearinghouse

Attachment: Native American Contacts list

Native American Contacts
Fresno County
September 10, 2013

Big Sandy Rancheria of Mono Indians
Elizabeth Hutchins Kipp, Chairperson
P.O. Box 337 / 37302 — Western Mono
Auberry , CA 93602
ck@bigsandyrancheria.com
(559) 855-4003
(559) 855-4129 Fax

Kings River Choinumni Farm Tribe
John Davis, Chairman
1064 Oxford Avenue — Foothill Yokuts, Choinumni
Clovis , CA 93612-2211
(559) 307-6430

Cold Springs Rancheria of Mono Indians
Robert Marquez, Chairperson
P.O. Box 209 — Mono
Tollhouse , CA 93667
(559) 855-5043
559-855-4445 - FAX

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

Dumna Wo-Wah Tribal Goverment
Robert Ledger SR., Tribal Chairperson
2216 East Hammond Street — Dumna/Foothill Mono
Fresno , CA 93702
ledgerrobert@ymail.com
559-519-1742 - office

The Choinumni Tribe of Yokuts
Rosemary Smith, Chairperson
1099 Pistachio Avenue — Choinumni, Foothill YoKut
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Lalo Franco, Cultural Coordinator
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Lemoore , CA 93245
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(559) 924-3583 - FAX

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.

his list s only applicable for contacting local Native Americans with regard to cultural resources for the proposed SCH#2013091021; CEQA Notice of Preparation (NOP); draft Environmental Impact Report (DEIR) for the Fresno Metropololtan Water Resources Management Plan Update; located in the City of Fresno; Fresno County, California.

EDMUND G. BROWN JR.
GOVERNOR

KEN ALEX
DIRECTOR

Notice of Preparation

September 6, 2013

To: Reviewing Agencies

Re: Fresno Metropolitan Water Resources Management Plan Update
SCH# 2013091021

Attached for your review and comment is the Notice of Preparation (NOP) for the Fresno Metropolitan Water Resources Management Plan Update draft Environmental Impact Report (EIR).

Responsible agencies must transmit their comments on the scope and content of the NOP, focusing on specific information related to their own statutory responsibility, <u>within 30 days of receipt of the NOP from the Lead Agency</u>. This is a courtesy notice provided by the State Clearinghouse with a reminder for you to comment in a timely manner. We encourage other agencies to also respond to this notice and express their concerns early in the environmental review process.

Please direct your comments to:

Brock Buche
City of Fresno
1910 East University Avenue
Fresno, CA 93703-2988

with a copy to the State Clearinghouse in the Office of Planning and Research. Please refer to the SCH number noted above in all correspondence concerning this project.

If you have any questions about the environmental document review process, please call the State Clearinghouse at (916) 445-0613.

Sincerely,

Scott Morgan
Director, State Clearinghouse

Attachments
cc: Lead Agency

Document Details Report
State Clearinghouse Data Base

SCH# 2013091021
Project Title Fresno Metropolitan Water Resources Management Plan Update
Lead Agency Fresno, City of

Type NOP Notice of Preparation

Description The overall objective of the City Metro Plan Update is to supply sufficient and reliable water supplies to meet the demands of existing and future customers through buildout of the applicable Fresno General Plan. The study area for the Metro Plan Update includes the existing city limits and City of Fresno Sphere of Influence (SOI) area designated by the 2025 Fresno General Plan as more particularly detailed in the attached Project Description.
The purpose of this Metro Plan Update is to update and refine the 1996 Fresno Metropolitan Water Resources Management Plan (1996 Metro Plan) taking into consideration available new data and accommodating physical and institutional changes which have occurred since the 1996 Metro Plan was prepared. The completed Metro Plan Update would facilitate future water resources decisions and utility planning, and would satisfy requirements for potential State funding.

Lead Agency Contact

Name Brock Buche
Agency City of Fresno
Phone 559 621 5325 **Fax**
email
Address 1910 East University Avenue
City Fresno **State** CA **Zip** 93703-2988

Project Location

County Fresno
City Fresno
Region
Cross Streets Various
Lat / Long
Parcel No. Various
Township **Range** **Section** **Base**

Proximity to:

Highways Hwy 41, 99, 161, 180
Airports Fresno
Railways
Waterways San Joaquin River Watershed
Schools Various
Land Use Various

Project Issues Other Issues

Reviewing Agencies Resources Agency; Department of Parks and Recreation; Department of Water Resources; Department of Fish and Wildlife, Region 4; CA Department of Public Health; Native American Heritage Commission; California Highway Patrol; Caltrans, District 6; State Water Resources Control Board, Divison of Financial Assistance; State Water Resources Control Board, Division of Water Rights; Regional Water Quality Control Bd., Region 5 (Fresno)

Date Received 09/06/2013 **Start of Review** 09/06/2013 **End of Review** 10/07/2013

Reviewing Agencies	Resources Agency; Department of Conservation; California Energy Commission; Department of Parks and Recreation; Department of Water Resources; Department of Fish and Wildlife, Region 4; Native American Heritage Commission; Public Utilities Commission; California Highway Patrol; Caltrans, District 6; Regional Water Quality Control Bd., Region 5 (Fresno)

Date Received	09/06/2013	***Start of Review***	09/06/2013	***End of Review***	10/07/2013

Notice of Completion & Environmental Document Transmittal

Mail to: State Clearinghouse, P. O. Box 3044, Sacramento, CA 95812-3044 (916) 445-0613
For Hand Delivery/Street Address: 1400 Tenth Street, Sacramento, CA 95814

SCH # 2013091021

Project Title: Fresno Metropolitan Water Resources Management Plan Update

Lead Agency: City of Fresno
Contact Person: Brock Buche, Project Manager
Mailing Address: City of Fresno Dept. Public Utilities, Water Division, 1910 East University Avenue
Phone: (559) 621-5325
City: Fresno Zip: 93703-2988 County: Fresno

Project Location: County: Fresno City/Nearest Community: City of Fresno
Cross Streets: Various Zip Code: 93703-2988
Lat. / Long.: Total Acres:
Assessor's Parcel No.: Various Section: Twp.: Range: Base:
Within 2 Miles: State Hwy #: 41, 99, 161, 180 Waterways: San Joaquin River Watershed
Airports: Fresno Cnty Railways: Schools: Various

RECEIVED
STATE CLEARING HOUSE

Document Type:

CEQA: ☒ NOP ☐ Early Cons ☐ Neg Dec ☐ Mit Neg Dec ☐ Draft EIR ☐ Supplement/Subsequent EIR (Prior SCH No.) Other

NEPA: ☐ NOI ☐ EA ☐ Draft EIS ☐ FONSI

Other: ☐ Joint Document ☐ Final Document ☐ Other

Local Action Type:

☐ General Plan Update ☐ General Plan Amendment ☐ General Plan Element ☐ Community Plan
☐ Specific Plan ☒ Master Plan ☐ Planned Unit Development ☐ Site Plan
☐ Rezone ☐ Prezone ☐ Use Permit ☐ Land Division (Subdivision, etc.)
☐ Annexation ☐ Redevelopment ☐ Coastal Permit ☒ Other Utilities

Development Type:

☐ Residential: Units Acres
☐ Office: Sq.ft. Acres Employees
☐ Commercial: Sq.ft. Acres Employees
☐ Industrial: Sq.ft. Acres Employees
☐ Educational
☐ Recreational
☒ Water Facilities: Type Water Supply MGD 140
☐ Transportation: Type
☐ Mining: Mineral
☐ Power: Type MW
☐ Waste Treatment: Type MGD
☐ Hazardous Waste: Type
☐ Other:

Project Issues Discussed in Document:

☐ Aesthetic/Visual ☐ Agricultural Land ☐ Air Quality ☐ Archeological/Historical ☐ Biological Resources ☐ Coastal Zone ☐ Drainage/Absorption ☐ Economic/Jobs
☐ Fiscal ☐ Flood Plain/Flooding ☐ Forest Land/Fire Hazard ☐ Geologic/Seismic ☐ Minerals ☐ Noise ☐ Population/Housing Balance ☐ Public Services/Facilities
☐ Recreation/Parks ☐ Schools/Universities ☐ Septic Systems ☐ Sewer Capacity ☐ Soil Erosion/Compaction/Grading ☐ Solid Waste ☐ Toxic/Hazardous ☐ Traffic/Circulation
☐ Vegetation ☐ Water Quality ☐ Water Supply/Groundwater ☐ Wetland/Riparian ☐ Wildlife ☐ Growth Inducing ☐ Land Use ☐ Cumulative Effects

☒ Other Request for comments on scope of Environmental Impact Report

Present Land Use/Zoning/General Plan Designation:

Various

Project Description: *(please use a separate page if necessary)*

See attached

Note: The state Clearinghouse will assign identification numbers for all new projects. If a SCH number already exists for a project (e.g. Notice of Preparation or previous draft document) please fill in.

SK

Resources Agency

- [x] **Resources Agency**
  Nadell Gayou
- [ ] **Dept. of Boating & Waterways**
  Nicole Wong
- [ ] **California Coastal Commission**
  Elizabeth A. Fuchs
- [ ] **Colorado River Board**
  Tamya M. Trujillo
- [ ] **Dept. of Conservation**
  Elizabeth Carpenter
- [ ] **California Energy Commission**
  Eric Knight
- [ ] **Cal Fire**
  Dan Foster
- [ ] **Central Valley Flood Protection Board**
  James Herota
- [ ] **Office of Historic Preservation**
  Ron Parsons
- [x] **Dept of Parks & Recreation**
  Environmental Stewardship Section
- [ ] **California Department of Resources, Recycling & Recovery**
  Sue O'Leary
- [ ] **S.F. Bay Conservation & Dev't. Comm.**
  Steve McAdam
- [x] **Dept. of Water Resources** Resources Agency
  Nadell Gayou

Fish and Game

- [ ] **Depart. of Fish & Wildlife**
  Scott Flint
  Environmental Services Division
- [ ] **Fish & Wildlife Region 1**
  Donald Koch
- [ ] **Fish & Wildlife Region 1E**
  Laurie Harnsberger
- [ ] **Fish & Wildlife Region 2**
  Jeff Drongesen
- [ ] **Fish & Wildlife Region 3**
  Charles Armor
- [x] **Fish & Wildlife Region 4**
  Julie Vance
- [ ] **Fish & Wildlife Region 5**
  Leslie Newton-Reed
  Habitat Conservation Program
- [ ] **Fish & Wildlife Region 6**
  Gabrina Gatchel
  Habitat Conservation Program
- [ ] **Fish & Wildlife Region 6 I/M**
  Heidi Sickler
  Inyo/Mono, Habitat Conservation Program
- [ ] **Dept. of Fish & Wildlife M**
  George Isaac
  Marine Region

Other Departments

- [ ] **Food & Agriculture**
  Sandra Schubert
  Dept. of Food and Agriculture
- [ ] **Depart. of General Services**
  Public School Construction
- [ ] **Dept. of General Services**
  Anna Garbeff
  Environmental Services Section
- [x] **Dept. of Public Health**
  Jeffery Worth
  Dept. of Health/Drinking Water
- [ ] **Delta Stewardship Council**
  Kevan Samsam

Independent Commissions,Boards

- [ ] **Delta Protection Commission**
  Michael Machado
- [ ] **Cal EMA (Emergency Management Agency)**
  Dennis Castrillo
- [x] **Native American Heritage Comm.**
  Debbie Treadway
- [ ] **Public Utilities Commission**
  Leo Wong
- [ ] **Santa Monica Bay Restoration**
  Guangyu Wang
- [ ] **State Lands Commission**
  Jennifer Deleong
- [ ] **Tahoe Regional Planning Agency (TRPA)**
  Cherry Jacques

Business, Trans & Housing

- [ ] **Caltrans - Division of Aeronautics**
  Philip Crimmins
- [ ] **Caltrans - Planning**
  Terri Pencovic
- [x] **California Highway Patrol**
  Suzann Ikeuchi
  Office of Special Projects
- [ ] **Housing & Community Development**
  CEQA Coordinator
  Housing Policy Division

Dept. of Transportation

- [ ] **Caltrans, District 1**
  Rex Jackman
- [ ] **Caltrans, District 2**
  Marcelino Gonzalez
- [ ] **Caltrans, District 3**
  Gary Arnold
- [ ] **Caltrans, District 4**
  Erik Alm
- [ ] **Caltrans, District 5**
  David Murray
- [x] **Caltrans, District 6**
  Michael Navarro
- [ ] **Caltrans, District 7**
  Dianna Watson
- [ ] **Caltrans, District 8**
  Dan Kopulsky
- [ ] **Caltrans, District 9**
  Gayle Rosander
- [ ] **Caltrans, District 10**
  Tom Dumas
- [ ] **Caltrans, District 11**
  Jacob Armstrong
- [ ] **Caltrans, District 12**
  Marlon Regisford

Cal EPA

Air Resources Board

- [ ] Airport/Energy Projects
  Jim Lerner
- [ ] Transportation Projects
  Douglas Ito
- [ ] Industrial Projects
  Mike Tollstrup
- [x] **State Water Resources Control Board**
  Regional Programs Unit
  Division of Financial Assistance
- [ ] **State Water Resources Control Board**
  Student Intern, 401 Water Quality Certification Unit
  Division of Water Quality
- [x] **State Water Resouces Control Board**
  Phil Crader
  Division of Water Rights
- [ ] **Dept. of Toxic Substances Control**
  CEQA Tracking Center
- [ ] **Department of Pesticide Regulation**
  CEQA Coordinator

Regional Water Quality Control Board (RWQCB)

- [ ] **RWQCB 1**
  Cathleen Hudson
  North Coast Region (1)
- [ ] **RWQCB 2**
  Environmental Document Coordinator
  San Francisco Bay Region (2)
- [ ] **RWQCB 3**
  Central Coast Region (3)
- [ ] **RWQCB 4**
  Teresa Rodgers
  Los Angeles Region (4)
- [ ] **RWQCB 5S**
  Central Valley Region (5)
- [x] **RWQCB 5F**
  Central Valley Region (5)
  Fresno Branch Office
- [ ] **RWQCB 5R**
  Central Valley Region (5)
  Redding Branch Office
- [ ] **RWQCB 6**
  Lahontan Region (6)
- [ ] **RWQCB 6V**
  Lahontan Region (6)
  Victorville Branch Office
- [ ] **RWQCB 7**
  Colorado River Basin Region (7)
- [ ] **RWQCB 8**
  Santa Ana Region (8)
- [ ] **RWQCB 9**
  San Diego Region (9)

- [ ] Other ______________
  ____
  ____
- [ ] ______________
  Conservancy

Last Updated 08/27/2013

September 20, 2013

Brock Buche
Project Manager
City of Fresno
Department of Public Utilities, Water Division
1910 East University Avenue
Fresno, CA 93703-2988

Dear Mr. Buche:

SUBJECT: NOTICE OF PREPARATION OF A DRAFT ENVIRONMENTAL IMPACT REPORT FOR FRESNO METROPOLITAN WATER RESOURCES MANAGEMENT PLAN UPDATE

The City of Fresno is the Sponsor of Fresno Yosemite International Airport (FAT) and Fresno Chandler Executive Airport (FCH) and, therefore, is subject to the Federal Aviation Administration (FAA) Grant Assurances. Any planning activities and subsequent implementation by the City of Fresno is subject FAA rules, regulations, advisor circulars, etc. The scope of the EIR needs to incorporate a review of these regulations and address potential impacts to the safe navigation of aircraft at and around FAT and FCH.

In particular, FAA Grant Assurance Numbers 20 and 21 may have the most significant impact on the planned projects and programs identified in the Fresno Metropolitan Water Resources Management Plan Update.

> Grant Assurance 20: Hazard Removal and Mitigation. It will take appropriate action, to assure that such terminal airspace as is required to protect instrument and visual operations to the airport (including established minimum flight altitudes) will be adequately cleared and protected by removing, lowering, relocating, marking, or lighting or otherwise mitigating existing airport hazards and by preventing the establishment, or creation of future airport hazards.
>
> Grant Assurance 21: Compatible Land Use. It will take appropriate actions, to the extent reasonable, including the adoption of zoning laws, to restrict the use of land adjacent to or in the immediate vicinity of the airport to activities and purposes compatible with normal airport operations, including landing and takeoff of aircraft. In addition, if the project is for noise compatibility program implementation, it will not or permit any change in land use, within its jurisdiction, that will reduce its compatibility, with respect to the airport, of the noise compatibility program measures upon which Federal funds have been expended.

Federal Aviation Administration (FAA) Advisory Circular 150/5200-33B Hazardous Wildlife Attractants On or Near Airports (attached) details the types of hazards and location with respect to airport approach and departure airspace. The Advisory Circular recommends a five statute mile distance between the edge of the air operations area and any hazardous wildlife attractant. Hazardous wildlife attractants within this distance should be avoided, eliminated or mitigated. The proposed SE SWTP and recharge basins fall within this five mile perimeter and potentially pose a hazard to air navigation. These items must be completely addressed in the EIR.

In addition, it is recommended that the City file a FAA Form 7460-1 Notice of Proposed Construction or Alteration related to the SE SWTP and associated basins as soon as able. This will initiate an FAA evaluation of the projects as it relates to the safe navigation of aircraft. The results of this evaluation could significantly impact the projects. The Airports Department can assist with the filing if requested. The application can be made on line at https://oeaaa.faa.gov/oeaaa/external/portal.jsp.

If you should have any questions, contact me at 559-621-4526 or Daniel.yrigollen@fresno.gov.

Sincerely,

Dal Yrigollen

Daniel Yrigollen
Airports Planning Manager (Interim)

Enclosures: FAA Grant Assurances
Advisory Circular 150/5200-33B Hazardous Wildlife Attractants On or Near Airports

c: Kevin Meikle, Director of Aviation
Mark Davis, Airport Projects Supervisor (Interim)
Project File

U.S. Department of Transportation

Federal Aviation Administration

Advisory Circular

Subject: HAZARDOUS WILDLIFE ATTRACTANTS ON OR NEAR AIRPORTS	**Date:** 8/28/2007	**AC No:** 150/5200-33B
	Initiated by: AAS-300	**Change:**

1. PURPOSE. This Advisory Circular (AC) provides guidance on certain land uses that have the potential to attract hazardous wildlife on or near public-use airports. It also discusses airport development projects (including airport construction, expansion, and renovation) affecting aircraft movement near hazardous wildlife attractants. Appendix 1 provides definitions of terms used in this AC.

2. APPLICABILITY. The Federal Aviation Administration (FAA) recommends that public-use airport operators implement the standards and practices contained in this AC. The holders of Airport Operating Certificates issued under Title 14, Code of Federal Regulations (CFR), Part 139, Certification of Airports, Subpart D (Part 139), may use the standards, practices, and recommendations contained in this AC to comply with the wildlife hazard management requirements of Part 139. Airports that have received Federal grant-in-aid assistance must use these standards. The FAA also recommends the guidance in this AC for land-use planners, operators of non-certificated airports, and developers of projects, facilities, and activities on or near airports.

3. CANCELLATION. This AC cancels AC 150/5200-33A, *Hazardous Wildlife Attractants on or near Airports*, dated July 27, 2004.

4. PRINCIPAL CHANGES. This AC contains the following major changes, which are marked with vertical bars in the margin:

a. Technical changes to paragraph references.

b. Wording on storm water detention ponds.

c. Deleted paragraph 4-3.b, *Additional Coordination.*

5. BACKGROUND. Information about the risks posed to aircraft by certain wildlife species has increased a great deal in recent years. Improved reporting, studies, documentation, and statistics clearly show that aircraft collisions with birds and other wildlife are a serious economic and public safety problem. While many species of wildlife can pose a threat to aircraft safety, they are not equally hazardous. Table 1 ranks the wildlife groups commonly involved in damaging strikes in the United States according to their relative hazard to aircraft. The ranking is based on the 47,212 records in the FAA National Wildlife Strike Database for the years 1990 through 2003. These hazard rankings, in conjunction with site-specific Wildlife Hazards Assessments (WHA), will help airport operators determine the relative abundance and use patterns of wildlife species and help focus hazardous wildlife management efforts on those species most likely to cause problems at an airport.

Most public-use airports have large tracts of open, undeveloped land that provide added margins of safety and noise mitigation. These areas can also present potential hazards to aviation if they encourage wildlife to enter an airport's approach or departure airspace or air operations area (AOA). Constructed or natural areas—such as poorly drained locations, detention/retention ponds, roosting habitats on buildings, landscaping, odor-causing rotting organic matter (putrescible waste) disposal operations, wastewater treatment plants, agricultural or aquaculture activities, surface mining, or wetlands—can provide wildlife with ideal locations for feeding, loafing, reproduction, and escape. Even small facilities, such as fast food restaurants, taxicab staging areas, rental car facilities, aircraft viewing areas, and public parks, can produce substantial attractions for hazardous wildlife.

During the past century, wildlife-aircraft strikes have resulted in the loss of hundreds of lives worldwide, as well as billions of dollars in aircraft damage. Hazardous wildlife attractants on and near airports can jeopardize future airport expansion, making proper community land-use planning essential. This AC provides airport operators and those parties with whom they cooperate with the guidance they need to assess and address potentially hazardous wildlife attractants when locating new facilities and implementing certain land-use practices on or near public-use airports.

6. MEMORANDUM OF AGREEMENT BETWEEN FEDERAL RESOURCE AGENCIES. The FAA, the U.S. Air Force, the U.S. Army Corps of Engineers, the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, and the U.S. Department of Agriculture - Wildlife Services signed a Memorandum of Agreement (MOA) in July 2003 to acknowledge their respective missions in protecting aviation from wildlife hazards. Through the MOA, the agencies established procedures necessary to coordinate their missions to address more effectively existing and future environmental conditions contributing to collisions between wildlife and aircraft (wildlife strikes) throughout the United States. These efforts are intended to minimize wildlife risks to aviation and human safety while protecting the Nation's valuable environmental resources.

DAVID L. BENNETT
Director, Office of Airport Safety
and Standards

Table 1. Ranking of 25 species groups as to relative hazard to aircraft (1=most hazardous) based on three criteria (damage, major damage, and effect-on-flight), a composite ranking based on all three rankings, and a relative hazard score. Data were derived from the FAA National Wildlife Strike Database, January 1990–April 2003.[1]

Species group	Ranking by criteria: Damage[4]	Major damage[5]	Effect on flight[6]	Composite ranking[2]	Relative hazard score[3]
Deer	1	1	1	1	100
Vultures	2	2	2	2	64
Geese	3	3	6	3	55
Cormorants/pelicans	4	5	3	4	54
Cranes	7	6	4	5	47
Eagles	6	9	7	6	41
Ducks	5	8	10	7	39
Osprey	8	4	8	8	39
Turkey/pheasants	9	7	11	9	33
Herons	11	14	9	10	27
Hawks (buteos)	10	12	12	11	25
Gulls	12	11	13	12	24
Rock pigeon	13	10	14	13	23
Owls	14	13	20	14	23
H. lark/s. bunting	18	15	15	15	17
Crows/ravens	15	16	16	16	16
Coyote	16	19	5	17	14
Mourning dove	17	17	17	18	14
Shorebirds	19	21	18	19	10
Blackbirds/starling	20	22	19	20	10
American kestrel	21	18	21	21	9
Meadowlarks	22	20	22	22	7
Swallows	24	23	24	23	4
Sparrows	25	24	23	24	4
Nighthawks	23	25	25	25	1

[1] Excerpted from the *Special Report for the FAA, "Ranking the Hazard Level of Wildlife Species to Civil Aviation in the USA: Update #1, July 2, 2003"*. Refer to this report for additional explanations of criteria and method of ranking.

[2] Relative rank of each species group was compared with every other group for the three variables, placing the species group with the greatest hazard rank for ≥ 2 of the 3 variables above the next highest ranked group, then proceeding down the list.

[3] Percentage values, from Tables 3 and 4 in Footnote 1 of the *Special Report*, for the three criteria were summed and scaled down from 100, with 100 as the score for the species group with the maximum summed values and the greatest potential hazard to aircraft.

[4] Aircraft incurred at least some damage (destroyed, substantial, minor, or unknown) from strike.

[5] Aircraft incurred damage or structural failure, which adversely affected the structure strength, performance, or flight characteristics, and which would normally require major repair or replacement of the affected component, or the damage sustained makes it inadvisable to restore aircraft to airworthy condition.

[6] Aborted takeoff, engine shutdown, precautionary landing, or other.

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Table of Contents

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SECTION 1.

GENERAL SEPARATION CRITERIA FOR HAZARDOUS WILDLIFE ATTRACTANTS ON OR NEAR AIRPORTS.

1-1. INTRODUCTION. When considering proposed land uses, airport operators, local planners, and developers must take into account whether the proposed land uses, including new development projects, will increase wildlife hazards. Land-use practices that attract or sustain hazardous wildlife populations on or near airports can significantly increase the potential for wildlife strikes.

The FAA recommends the minimum separation criteria outlined below for land-use practices that attract hazardous wildlife to the vicinity of airports. Please note that FAA criteria include land uses that cause movement of hazardous wildlife onto, into, or across the airport's approach or departure airspace or air operations area (AOA). (See the discussion of the synergistic effects of surrounding land uses in Section 2-8 of this AC.)

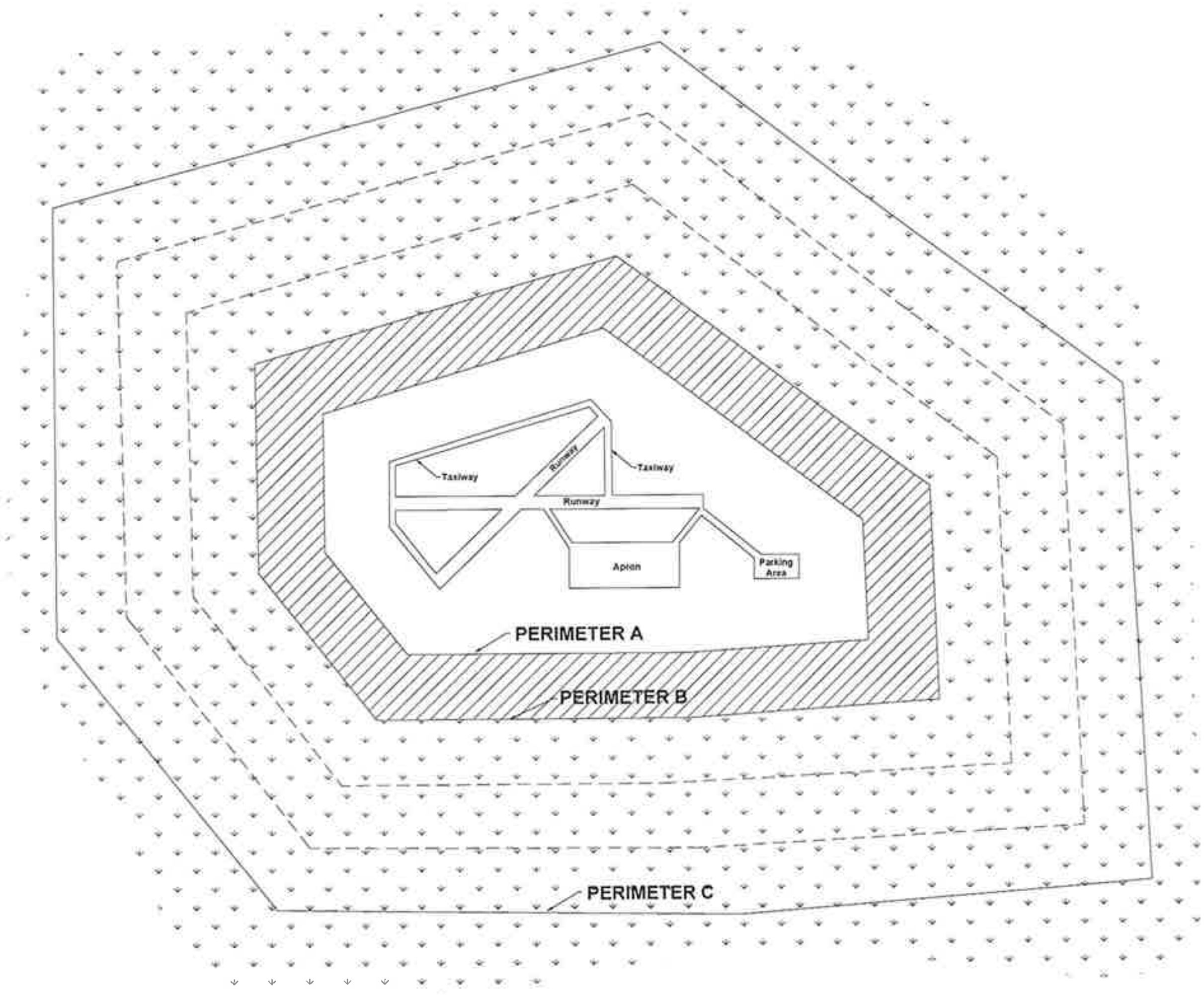
The basis for the separation criteria contained in this section can be found in existing FAA regulations. The separation distances are based on (1) flight patterns of piston-powered aircraft and turbine-powered aircraft, (2) the altitude at which most strikes happen (78 percent occur under 1,000 feet and 90 percent occur under 3,000 feet above ground level), and (3) National Transportation Safety Board (NTSB) recommendations.

1-2. AIRPORTS SERVING PISTON-POWERED AIRCRAFT. Airports that do not sell Jet-A fuel normally serve piston-powered aircraft. Notwithstanding more stringent requirements for specific land uses, the FAA recommends a separation distance of 5,000 feet at these airports for any of the hazardous wildlife attractants mentioned in Section 2 or for new airport development projects meant to accommodate aircraft movement. This distance is to be maintained between an airport's AOA and the hazardous wildlife attractant. Figure 1 depicts this separation distance measured from the nearest aircraft operations areas.

1-3. AIRPORTS SERVING TURBINE-POWERED AIRCRAFT. Airports selling Jet-A fuel normally serve turbine-powered aircraft. Notwithstanding more stringent requirements for specific land uses, the FAA recommends a separation distance of 10,000 feet at these airports for any of the hazardous wildlife attractants mentioned in Section 2 or for new airport development projects meant to accommodate aircraft movement. This distance is to be maintained between an airport's AOA and the hazardous wildlife attractant. Figure 1 depicts this separation distance from the nearest aircraft movement areas.

1-4. PROTECTION OF APPROACH, DEPARTURE, AND CIRCLING AIRSPACE. For all airports, the FAA recommends a distance of 5 statute miles between the farthest edge of the airport's AOA and the hazardous wildlife attractant if the attractant could cause hazardous wildlife movement into or across the approach or departure airspace.

Figure 1. Separation distances within which hazardous wildlife attractants should be avoided, eliminated, or mitigated.



PERIMETER A: For airports serving piston-powered aircraft, hazardous wildlife attractants must be 5,000 feet from the nearest air operations area.

PERIMETER B: For airports serving turbine-powered aircraft, hazardous wildlife attractants must be 10,000 feet from the nearest air operations area.

PERIMETER C: 5-mile range to protect approach, departure and circling airspace.

SECTION 2.

LAND-USE PRACTICES ON OR NEAR AIRPORTS THAT POTENTIALLY ATTRACT HAZARDOUS WILDLIFE.

2-1. GENERAL. The wildlife species and the size of the populations attracted to the airport environment vary considerably, depending on several factors, including land-use practices on or near the airport. This section discusses land-use practices having the potential to attract hazardous wildlife and threaten aviation safety. In addition to the specific considerations outlined below, airport operators should refer to *Wildlife Hazard Management at Airports,* prepared by FAA and U.S. Department of Agriculture (USDA) staff. (This manual is available in English, Spanish, and French. It can be viewed and downloaded free of charge from the FAA's wildlife hazard mitigation web site: http://wildlife-mitigation.tc.FAA.gov.). And, *Prevention and Control of Wildlife Damage,* compiled by the University of Nebraska Cooperative Extension Division. (This manual is available online in a periodically updated version at:
ianrwww.unl.edu/wildlife/solutions/handbook/.)

2-2. WASTE DISPOSAL OPERATIONS. Municipal solid waste landfills (MSWLF) are known to attract large numbers of hazardous wildlife, particularly birds. Because of this, these operations, when located within the separations identified in the siting criteria in Sections 1-2 through 1-4, are considered incompatible with safe airport operations.

a. **Siting for new municipal solid waste landfills subject to AIR 21.** Section 503 of the Wendell H. Ford Aviation Investment and Reform Act for the 21st Century (Public Law 106-181) (AIR 21) prohibits the construction or establishment of a new MSWLF within 6 statute miles of certain public-use airports. Before these prohibitions apply, both the airport and the landfill must meet the very specific conditions described below. These restrictions do not apply to airports or landfills located within the state of Alaska.

   The airport must (1) have received a Federal grant(s) under 49 U.S.C. § 47101, et. seq.; (2) be under control of a public agency; (3) serve some scheduled air carrier operations conducted in aircraft with less than 60 seats; and (4) have total annual enplanements consisting of at least 51 percent of scheduled air carrier enplanements conducted in aircraft with less than 60 passenger seats.

   The proposed MSWLF must (1) be within 6 miles of the airport, as measured from airport property line to MSWLF property line, and (2) have started construction or establishment on or after April 5, 2001. Public Law 106-181 only limits the construction or establishment of some new MSWLF. It does not limit the expansion, either vertical or horizontal, of existing landfills.

   NOTE: Consult the most recent version of AC 150/5200-34, *Construction or Establishment of Landfills Near Public Airports,* for a more detailed discussion of these restrictions.

b. **Siting for new MSWLF not subject to AIR 21.** If an airport and MSWLF do not meet the restrictions of Public Law 106-181, the FAA recommends against locating MSWLF within the separation distances identified in Sections 1-2 through 1-4. The separation distances should be measured from the closest point of the airport's AOA to the closest planned MSWLF cell.

c. **Considerations for existing waste disposal facilities within the limits of separation criteria.** The FAA recommends against airport development projects that would increase the number of aircraft operations or accommodate larger or faster aircraft near MSWLF operations located within the separations identified in Sections 1-2 through 1-4. In addition, in accordance with 40 CFR 258.10, owners or operators of existing MSWLF units that are located within the separations listed in Sections 1-2 through 1-4 must demonstrate that the unit is designed and operated so it does not pose a bird hazard to aircraft. (See Section 4-2(b) of this AC for a discussion of this demonstration requirement.)

d. **Enclosed trash transfer stations.** Enclosed waste-handling facilities that receive garbage behind closed doors; process it via compaction, incineration, or similar manner; and remove all residue by enclosed vehicles generally are compatible with safe airport operations, provided they are not located on airport property or within the Runway Protection Zone (RPZ). These facilities should not handle or store putrescible waste outside or in a partially enclosed structure accessible to hazardous wildlife. Trash transfer facilities that are open on one or more sides; that store uncovered quantities of municipal solid waste outside, even if only for a short time; that use semi-trailers that leak or have trash clinging to the outside; or that do not control odors by ventilation and filtration systems (odor masking is not acceptable) do not meet the FAA's definition of fully enclosed trash transfer stations. The FAA considers these facilities incompatible with safe airport operations if they are located closer than the separation distances specified in Sections 1-2 through 1-4.

e. **Composting operations on or near airport property.** Composting operations that accept only yard waste (e.g., leaves, lawn clippings, or branches) generally do not attract hazardous wildlife. Sewage sludge, woodchips, and similar material are not municipal solid wastes and may be used as compost bulking agents. The compost, however, must never include food or other municipal solid waste. Composting operations should not be located on airport property. Off-airport property composting operations should be located no closer than the greater of the following distances: 1,200 feet from any AOA or the distance called for by airport design requirements (see AC 150/5300-13, *Airport Design*). This spacing should prevent material, personnel, or equipment from penetrating any Object Free Area (OFA), Obstacle Free Zone (OFZ), Threshold Siting Surface (TSS), or Clearway. Airport operators should monitor composting operations located in proximity to the airport to ensure that steam or thermal rise does not adversely affect air traffic. On-airport disposal of compost by-products should not be conducted for the reasons stated in 2-3f.

f. **Underwater waste discharges.** The FAA recommends against the underwater discharge of any food waste (e.g., fish processing offal) within the separations identified in Sections 1-2 through 1-4 because it could attract scavenging hazardous wildlife.

g. **Recycling centers.** Recycling centers that accept previously sorted non-food items, such as glass, newspaper, cardboard, or aluminum, are, in most cases, not attractive to hazardous wildlife and are acceptable.

h. **Construction and demolition (C&D) debris facilities.** C&D landfills do not generally attract hazardous wildlife and are acceptable if maintained in an orderly manner, admit no putrescible waste, and are not co-located with other waste disposal operations. However, C&D landfills have similar visual and operational characteristics to putrescible waste disposal sites. When co-located with putrescible waste disposal operations, C&D landfills are more likely to attract hazardous wildlife because of the similarities between these disposal facilities. Therefore, a C&D landfill co-located with another waste disposal operation should be located outside of the separations identified in Sections 1-2 through 1-4.

i. **Fly ash disposal.** The incinerated residue from resource recovery power/heat-generating facilities that are fired by municipal solid waste, coal, or wood is generally not a wildlife attractant because it no longer contains putrescible matter. Landfills accepting only fly ash are generally not considered to be wildlife attractants and are acceptable as long as they are maintained in an orderly manner, admit no putrescible waste of any kind, and are not co-located with other disposal operations that attract hazardous wildlife.

Since varying degrees of waste consumption are associated with general incineration (not resource recovery power/heat-generating facilities), the FAA considers the ash from general incinerators a regular waste disposal by-product and, therefore, a hazardous wildlife attractant if disposed of within the separation criteria outlined in Sections 1-2 through 1-4.

2-3. WATER MANAGEMENT FACILITIES. Drinking water intake and treatment facilities, storm water and wastewater treatment facilities, associated retention and settling ponds, ponds built for recreational use, and ponds that result from mining activities often attract large numbers of potentially hazardous wildlife. To prevent wildlife hazards, land-use developers and airport operators may need to develop management plans, in compliance with local and state regulations, to support the operation of storm water management facilities on or near all public-use airports to ensure a safe airport environment.

a. **Existing storm water management facilities.** On-airport storm water management facilities allow the quick removal of surface water, including discharges related to aircraft deicing, from impervious surfaces, such as pavement and terminal/hangar building roofs. Existing on-airport detention ponds collect storm water, protect water quality, and control runoff. Because they slowly release water after storms, they create standing bodies of water that can attract hazardous wildlife. Where the airport has developed a Wildlife Hazard Management Plan (WHMP) in accordance with Part 139, the FAA requires immediate correction of any wildlife hazards arising from existing storm water facilities located on or near airports, using appropriate wildlife hazard mitigation techniques. Airport operators should develop measures to minimize hazardous wildlife attraction in consultation with a wildlife damage management biologist.

Where possible, airport operators should modify storm water detention ponds to allow a maximum 48-hour detention period for the design storm. The FAA recommends that airport operators avoid or remove retention ponds and detention ponds featuring dead storage to eliminate standing water. Detention basins should remain totally dry between rainfalls. Where constant flow of water is anticipated through the basin, or where any portion of the basin bottom may remain wet, the detention facility should include a concrete or paved pad and/or ditch/swale in the bottom to prevent vegetation that may provide nesting habitat.

When it is not possible to drain a large detention pond completely, airport operators may use physical barriers, such as bird balls, wires grids, pillows, or netting, to deter birds and other hazardous wildlife. When physical barriers are used, airport operators must evaluate their use and ensure they will not adversely affect water rescue. Before installing any physical barriers over detention ponds on Part 139 airports, airport operators must get approval from the appropriate FAA Regional Airports Division Office.

The FAA recommends that airport operators encourage off-airport storm water treatment facility operators to incorporate appropriate wildlife hazard mitigation techniques into storm water treatment facility operating practices when their facility is located within the separation criteria specified in Sections 1-2 through 1-4.

b. **New storm water management facilities.** The FAA strongly recommends that off-airport storm water management systems located within the separations identified in Sections 1-2 through 1-4 be designed and operated so as not to create above-ground standing water. Stormwater detention ponds should be designed, engineered, constructed, and maintained for a maximum 48–hour detention period after the design storm and remain completely dry between storms. To facilitate the control of hazardous wildlife, the FAA recommends the use of steep-sided, rip-rap lined, narrow, linearly shaped water detention basins. When it is not possible to place these ponds away from an airport's AOA, airport operators should use physical barriers, such as bird balls, wires grids, pillows, or netting, to prevent access of hazardous wildlife to open water and minimize aircraft-wildlife interactions. When physical barriers are used, airport operators must evaluate their use and ensure they will not adversely affect water rescue. Before installing any physical barriers over detention ponds on Part 139 airports, airport operators must get approval from the appropriate FAA Regional Airports Division Office. All vegetation in or around detention basins that provide food or cover for hazardous wildlife should be eliminated. If soil conditions and other requirements allow, the FAA encourages the use of underground storm water infiltration systems, such as French drains or buried rock fields, because they are less attractive to wildlife.

c. **Existing wastewater treatment facilities.** The FAA strongly recommends that airport operators immediately correct any wildlife hazards arising from existing wastewater treatment facilities located on or near the airport. Where required, a WHMP developed in accordance with Part 139 will outline appropriate wildlife hazard mitigation techniques. Accordingly, airport operators should encourage wastewater treatment facility operators to incorporate measures, developed in consultation with a wildlife damage management biologist, to minimize hazardous wildlife attractants. Airport operators should also encourage those wastewater treatment facility operators to incorporate these mitigation techniques into their standard operating practices. In addition, airport operators should consider the existence of wastewater treatment facilities when evaluating proposed sites for new airport development projects and avoid such sites when practicable.

d. **New wastewater treatment facilities.** The FAA strongly recommends against the construction of new wastewater treatment facilities or associated settling ponds within the separations identified in Sections 1-2 through 1-4. Appendix 1 defines wastewater treatment facility as "any devices and/or systems used to store, treat, recycle, or reclaim municipal sewage or liquid industrial wastes." The definition includes any pretreatment involving the reduction of the amount of pollutants or the elimination of pollutants prior to introducing such pollutants into a publicly owned treatment works (wastewater treatment facility). During the site-location analysis for wastewater treatment facilities, developers should consider the potential to attract hazardous wildlife if an airport is in the vicinity of the proposed site, and airport operators should voice their opposition to such facilities if they are in proximity to the airport.

e. **Artificial marshes.** In warmer climates, wastewater treatment facilities sometimes employ artificial marshes and use submergent and emergent aquatic vegetation as natural filters. These artificial marshes may be used by some species of flocking birds, such as blackbirds and waterfowl, for breeding or roosting activities. The FAA strongly recommends against establishing artificial marshes within the separations identified in Sections 1-2 through 1-4.

f. **Wastewater discharge and sludge disposal.** The FAA recommends against the discharge of wastewater or sludge on airport property because it may improve soil moisture and quality on unpaved areas and lead to improved turf growth that can be an attractive food source for many species of animals. Also, the turf requires more frequent mowing, which in turn may mutilate or flush insects or small animals and produce straw, both of which can attract hazardous wildlife. In addition, the improved turf may attract grazing wildlife, such as deer and geese. Problems may also occur when discharges saturate unpaved airport areas. The resultant soft, muddy conditions can severely restrict or prevent emergency vehicles from reaching accident sites in a timely manner.

2-4. WETLANDS. Wetlands provide a variety of functions and can be regulated by local, state, and Federal laws. Normally, wetlands are attractive to many types of wildlife, including many which rank high on the list of hazardous wildlife species (Table 1).

NOTE: If questions exist as to whether an area qualifies as a wetland, contact the local division of the U.S. Army Corps of Engineers, the Natural Resources Conservation Service, or a wetland consultant qualified to delineate wetlands.

a. **Existing wetlands on or near airport property.** If wetlands are located on or near airport property, airport operators should be alert to any wildlife use or habitat changes in these areas that could affect safe aircraft operations. At public-use airports, the FAA recommends immediately correcting, in cooperation with local, state, and Federal regulatory agencies, any wildlife hazards arising from existing wetlands located on or near airports. Where required, a WHMP will outline appropriate wildlife hazard mitigation techniques. Accordingly, airport operators should develop measures to minimize hazardous wildlife attraction in consultation with a wildlife damage management biologist.

b. **New airport development.** Whenever possible, the FAA recommends locating new airports using the separations from wetlands identified in Sections 1-2 through 1-4. Where alternative sites are not practicable, or when airport operators are expanding an existing airport into or near wetlands, a wildlife damage management biologist, in consultation with the U.S. Fish and Wildlife Service, the U.S. Army Corps of Engineers, and the state wildlife management agency should evaluate the wildlife hazards and prepare a WHMP that indicates methods of minimizing the hazards.

c. **Mitigation for wetland impacts from airport projects.** Wetland mitigation may be necessary when unavoidable wetland disturbances result from new airport development projects or projects required to correct wildlife hazards from wetlands. Wetland mitigation must be designed so it does not create a wildlife hazard. The FAA recommends that wetland mitigation projects that may attract hazardous wildlife be sited outside of the separations identified in Sections 1-2 through 1-4.

(1) Onsite mitigation of wetland functions. The FAA may consider exceptions to locating mitigation activities outside the separations identified in Sections 1-2 through 1-4 if the affected wetlands provide unique ecological functions, such as critical habitat for threatened or endangered species or ground water recharge, which cannot be replicated when moved to a different location. Using existing airport property is sometimes the only feasible way to achieve the mitigation ratios mandated in regulatory orders and/or settlement agreements with the resource agencies. Conservation easements are an additional means of providing mitigation for project impacts. Typically the airport operator continues to own the property, and an easement is created stipulating that the property will be maintained as habitat for state or Federally listed species.

Mitigation must not inhibit the airport operator's ability to effectively control hazardous wildlife on or near the mitigation site or effectively maintain other aspects of safe airport operations. Enhancing such mitigation areas to attract hazardous wildlife must be avoided. The FAA will review any onsite mitigation proposals to determine compatibility with safe airport operations. A wildlife damage management biologist should evaluate any wetland mitigation projects that are needed to protect unique wetland functions and that must be located in the separation criteria in Sections 1-2 through 1-4 before the mitigation is implemented. A WHMP should be developed to reduce the wildlife hazards.

(2) Offsite mitigation of wetland functions. The FAA recommends that wetland mitigation projects that may attract hazardous wildlife be sited outside of the separations identified in Sections 1-2 through 1-4 unless they provide unique functions that must remain onsite (see 2-4c(1)). Agencies that regulate impacts to or around wetlands recognize that it may be necessary to split wetland functions in mitigation schemes. Therefore, regulatory agencies may, under certain circumstances, allow portions of mitigation to take place in different locations.

(3) Mitigation banking. Wetland mitigation banking is the creation or restoration of wetlands in order to provide mitigation credits that can be used to offset permitted wetland losses. Mitigation banking benefits wetland resources by providing advance replacement for permitted wetland losses; consolidating small projects into larger, better-designed and managed units; and encouraging integration of wetland mitigation projects with watershed planning. This last benefit is most helpful for airport projects, as wetland impacts mitigated outside of the separations identified in Sections 1-2 through 1-4 can still be located within the same watershed. Wetland mitigation banks meeting the separation criteria offer an ecologically sound approach to mitigation in these situations. Airport operators should work with local watershed management agencies or organizations to develop mitigation banking for wetland impacts on airport property.

2-5. DREDGE SPOIL CONTAINMENT AREAS. The FAA recommends against locating dredge spoil containment areas (also known as Confined Disposal Facilities) within the separations identified in Sections 1-2 through 1-4 if the containment area or the spoils contain material that would attract hazardous wildlife.

2-6. AGRICULTURAL ACTIVITIES. Because most, if not all, agricultural crops can attract hazardous wildlife during some phase of production, the FAA recommends against the used of airport property for agricultural production, including hay crops, within the separations identified in Sections 1-2 through 1-4. . If the airport has no financial alternative to agricultural crops to produce income necessary to maintain the viability of the airport, then the airport shall follow the crop distance guidelines listed in the table titled "Minimum Distances between Certain Airport Features and Any On-Airport Agricultural Crops" found in AC 150/5300-13, *Airport Design*, Appendix 17. The cost of wildlife control and potential accidents should be weighed against the income produced by the on-airport crops when deciding whether to allow crops on the airport.

a. **Livestock production.** Confined livestock operations (i.e., feedlots, dairy operations, hog or chicken production facilities, or egg laying operations) often attract flocking birds, such as starlings, that pose a hazard to aviation. Therefore, The FAA recommends against such facilities within the separations identified in Sections 1-2 through 1-4. Any livestock operation within these separations should have a program developed to reduce the attractiveness of the site to species that are hazardous to aviation safety. Free-ranging livestock must not be grazed on airport property because the animals may wander onto the AOA. Furthermore, livestock feed, water, and manure may attract birds.

b. **Aquaculture.** Aquaculture activities (i.e. catfish or trout production) conducted outside of fully enclosed buildings are inherently attractive to a wide variety of birds. Existing aquaculture facilities/activities within the separations listed in Sections 1-2 through 1-4 must have a program developed to reduce the attractiveness of the sites to species that are hazardous to aviation safety. Airport operators should also oppose the establishment of new aquaculture facilities/activities within the separations listed in Sections 1-2 through 1-4.

c. **Alternative uses of agricultural land.** Some airports are surrounded by vast areas of farmed land within the distances specified in Sections 1-2 through 1-4. Seasonal uses of agricultural land for activities such as hunting can create a hazardous wildlife situation. In some areas, farmers will rent their land for hunting purposes. Rice farmers, for example, flood their land during waterfowl hunting season and obtain additional revenue by renting out duck blinds. The duck hunters then use decoys and call in hundreds, if not thousands, of birds, creating a tremendous threat to aircraft safety. A wildlife damage management biologist should review, in coordination with local farmers and producers, these types of seasonal land uses and incorporate them into the WHMP.

2-7. GOLF COURSES, LANDSCAPING AND OTHER LAND-USE CONSIDERATIONS.

a. **Golf courses.** The large grassy areas and open water found on most golf courses are attractive to hazardous wildlife, particularly Canada geese and some species of gulls. These species can pose a threat to aviation safety. The FAA recommends against construction of new golf courses within the separations identified in Sections 1-2 through 1-4. Existing golf courses located within these separations must develop a program to reduce the attractiveness of the sites to species that are hazardous to aviation safety. Airport operators should ensure these golf courses are monitored on a continuing basis for the presence of hazardous wildlife. If hazardous wildlife is detected, corrective actions should be immediately implemented.

b. **Landscaping and landscape maintenance.** Depending on its geographic location, landscaping can attract hazardous wildlife. The FAA recommends that airport operators approach landscaping with caution and confine it to airport areas not associated with aircraft movements. A wildlife damage management biologist should review all landscaping plans. Airport operators should also monitor all landscaped areas on a continuing basis for the presence of hazardous wildlife. If hazardous wildlife is detected, corrective actions should be immediately implemented.

Turf grass areas can be highly attractive to a variety of hazardous wildlife species. Research conducted by the USDA Wildlife Services' National Wildlife Research Center has shown that no one grass management regime will deter all species of hazardous wildlife in all situations. In cooperation with wildlife damage management biologist, airport operators should develop airport turf grass management plans on a prescription basis, depending on the airport's geographic locations and the type of hazardous wildlife likely to frequent the airport

Airport operators should ensure that plant varieties attractive to hazardous wildlife are not used on the airport. Disturbed areas or areas in need of re-vegetating should not be planted with seed mixtures containing millet or any other large-seed producing grass. For airport property already planted with seed mixtures containing millet, rye grass, or other large-seed producing grasses, the FAA recommends disking, plowing, or another suitable agricultural practice to prevent plant maturation and seed head production. Plantings should follow the specific recommendations for grass management and seed and plant selection made by the State University Cooperative Extension Service, the local office of Wildlife Services, or a qualified wildlife damage management biologist. Airport operators should also consider developing and implementing a preferred/prohibited plant species list, reviewed by a wildlife damage management biologist, which has been designed for the geographic location to reduce the attractiveness to hazardous wildlife for landscaping airport property.

c. **Airports surrounded by wildlife habitat.** The FAA recommends that operators of airports surrounded by woodlands, water, or wetlands refer to Section 2.4 of this AC. Operators of such airports should provide for a Wildlife Hazard Assessment (WHA) conducted by a wildlife damage management biologist. This WHA is the first step in preparing a WHMP, where required.

d. **Other hazardous wildlife attractants.** Other specific land uses or activities (e.g., sport or commercial fishing, shellfish harvesting, etc.), perhaps unique to certain regions of the country, have the potential to attract hazardous wildlife. Regardless of the source of the attraction, when hazardous wildlife is noted on a public-use airport, airport operators must take prompt remedial action(s) to protect aviation safety.

2-8. SYNERGISTIC EFFECTS OF SURROUNDING LAND USES. There may be circumstances where two (or more) different land uses that would not, by themselves, be considered hazardous wildlife attractants or that are located outside of the separations identified in Sections 1-2 through 1-4 that are in such an alignment with the airport as to create a wildlife corridor directly through the airport and/or surrounding airspace. An example of this situation may involve a lake located outside of the separation criteria on the east side of an airport and a large hayfield on the west side of an airport, land uses that together could create a flyway for Canada geese directly across the airspace of the airport. There are numerous examples of such situations;

therefore, airport operators and the wildlife damage management biologist must consider the entire surrounding landscape and community when developing the WHMP.

SECTION 3.

PROCEDURES FOR WILDLIFE HAZARD MANAGEMENT BY OPERATORS OF PUBLIC-USE AIRPORTS.

3.1. INTRODUCTION. In recognition of the increased risk of serious aircraft damage or the loss of human life that can result from a wildlife strike, the FAA may require the development of a Wildlife Hazard Management Plan (WHMP) when specific triggering events occur on or near the airport. Part 139.337 discusses the specific events that trigger a Wildlife Hazard Assessment (WHA) and the specific issues that a WHMP must address for FAA approval and inclusion in an Airport Certification Manual.

3.2. COORDINATION WITH USDA WILDLIFE SERVICES OR OTHER QUALIFIED WILDLIFE DAMAGE MANAGEMENT BIOLOGISTS. The FAA will use the Wildlife Hazard Assessment (WHA) conducted in accordance with Part 139 to determine if the airport needs a WHMP. Therefore, persons having the education, training, and expertise necessary to assess wildlife hazards must conduct the WHA. The airport operator may look to Wildlife Services or to qualified private consultants to conduct the WHA. When the services of a wildlife damage management biologist are required, the FAA recommends that land-use developers or airport operators contact a consultant specializing in wildlife damage management or the appropriate state director of Wildlife Services.

NOTE: Telephone numbers for the respective USDA Wildlife Services state offices can be obtained by contacting USDA Wildlife Services Operational Support Staff, 4700 River Road, Unit 87, Riverdale, MD, 20737-1234, Telephone (301) 734-7921, Fax (301) 734-5157 *(http://www.aphis.usda.gov/ws/)*.

3-3. WILDLIFE HAZARD MANAGEMENT AT AIRPORTS: A MANUAL FOR AIRPORT PERSONNEL. This manual, prepared by FAA and USDA Wildlife Services staff, contains a compilation of information to assist airport personnel in the development, implementation, and evaluation of WHMPs at airports. The manual includes specific information on the nature of wildlife strikes, legal authority, regulations, wildlife management techniques, WHAs, WHMPs, and sources of help and information. The manual is available in three languages: English, Spanish, and French. It can be viewed and downloaded free of charge from the FAA's wildlife hazard mitigation web site: http://wildlife-mitigation.tc.FAA.gov/. This manual only provides a starting point for addressing wildlife hazard issues at airports. Hazardous wildlife management is a complex discipline and conditions vary widely across the United States. Therefore, qualified wildlife damage management biologists must direct the development of a WHMP and the implementation of management actions by airport personnel.

There are many other resources complementary to this manual for use in developing and implementing WHMPs. Several are listed in the manual's bibliography.

3-4. WILDLIFE HAZARD ASSESSMENTS, TITLE 14, CODE OF FEDERAL REGULATIONS, PART 139. Part 139.337(b) requires airport operators to conduct a Wildlife Hazard Assessment (WHA) when certain events occur on or near the airport.

Part 139.337 (c) provides specific guidance as to what facts must be addressed in a WHA.

3-5. WILDLIFE HAZARD MANAGEMENT PLAN (WHMP). The FAA will consider the results of the WHA, along with the aeronautical activity at the airport and the views of the airport operator and airport users, in determining whether a formal WHMP is needed, in accordance with Part 139.337. If the FAA determines that a WHMP is needed, the airport operator must formulate and implement a WHMP, using the WHA as the basis for the plan.

The goal of an airport's Wildlife Hazard Management Plan is to minimize the risk to aviation safety, airport structures or equipment, or human health posed by populations of hazardous wildlife on and around the airport.

The WHMP must identify hazardous wildlife attractants on or near the airport and the appropriate wildlife damage management techniques to minimize the wildlife hazard. It must also prioritize the management measures.

3-6. LOCAL COORDINATION. The establishment of a Wildlife Hazards Working Group (WHWG) will facilitate the communication, cooperation, and coordination of the airport and its surrounding community necessary to ensure the effectiveness of the WHMP. The cooperation of the airport community is also necessary when new projects are considered. Whether on or off the airport, the input from all involved parties must be considered when a potentially hazardous wildlife attractant is being proposed. Airport operators should also incorporate public education activities with the local coordination efforts because some activities in the vicinity of your airport, while harmless under normal leisure conditions, can attract wildlife and present a danger to aircraft. For example, if public trails are planned near wetlands or in parks adjoining airport property, the public should know that feeding birds and other wildlife in the area may pose a risk to aircraft.

Airport operators should work with local and regional planning and zoning boards so as to be aware of proposed land-use changes, or modification of existing land uses, that could create hazardous wildlife attractants within the separations identified in Sections 1-2 through 1-4. Pay particular attention to proposed land uses involving creation or expansion of waste water treatment facilities, development of wetland mitigation sites, or development or expansion of dredge spoil containment areas. At the very least, airport operators must ensure they are on the notification list of the local planning board or equivalent review entity for all communities located within 5 miles of the airport, so they will receive notification of any proposed project and have the opportunity to review it for attractiveness to hazardous wildlife.

3-7 COORDINATION/NOTIFICATION OF AIRMEN OF WILDLIFE HAZARDS. If an existing land-use practice creates a wildlife hazard and the land-use practice or wildlife hazard cannot be immediately eliminated, airport operators must issue a Notice to Airmen (NOTAM) and encourage the land–owner or manager to take steps to control the wildlife hazard and minimize further attraction.

SECTION 4.

FAA NOTIFICATION AND REVIEW OF PROPOSED LAND-USE PRACTICE CHANGES IN THE VICINITY OF PUBLIC-USE AIRPORTS

4-1. FAA REVIEW OF PROPOSED LAND-USE PRACTICE CHANGES IN THE VICINITY OF PUBLIC-USE AIRPORTS.

a. The FAA discourages the development of waste disposal and other facilities, discussed in Section 2, located within the 5,000/10,000-foot criteria specified in Sections 1-2 through 1-4.

b. For projects that are located outside the 5,000/10,000-foot criteria but within 5 statute miles of the airport's AOA, the FAA may review development plans, proposed land-use changes, operational changes, or wetland mitigation plans to determine if such changes present potential wildlife hazards to aircraft operations. The FAA considers sensitive airport areas as those that lie under or next to approach or departure airspace. This brief examination should indicate if further investigation is warranted.

c. Where a wildlife damage management biologist has conducted a further study to evaluate a site's compatibility with airport operations, the FAA may use the study results to make a determination.

4-2. WASTE MANAGEMENT FACILITIES.

a. Notification of new/expanded project proposal. Section 503 of the Wendell H. Ford Aviation Investment and Reform Act for the 21st Century (Public Law 106-181) limits the construction or establishment of new MSWLF within 6 statute miles of certain public-use airports, when both the airport and the landfill meet very specific conditions. See Section 2-2 of this AC and AC 150/5200-34 for a more detailed discussion of these restrictions.

The Environmental Protection Agency (EPA) requires any MSWLF operator proposing a new or expanded waste disposal operation within 5 statute miles of a runway end to notify the appropriate FAA Regional Airports Division Office and the airport operator of the proposal (40 CFR 258, *Criteria for Municipal Solid Waste Landfills*, Section 258.10, *Airport Safety*). The EPA also requires owners or operators of new MSWLF units, or lateral expansions of existing MSWLF units, that are located within 10,000 feet of any airport runway end used by turbojet aircraft, or within 5,000 feet of any airport runway end used only by piston-type aircraft, to demonstrate successfully that such units are not hazards to aircraft. (See 4-2.b below.)

When new or expanded MSWLF are being proposed near airports, MSWLF operators must notify the airport operator and the FAA of the proposal as early as possible pursuant to 40 CFR 258.

b. **Waste handling facilities within separations identified in Sections 1-2 through 1-4.** To claim successfully that a waste-handling facility sited within the separations identified in Sections 1-2 through 1-4 does not attract hazardous wildlife and does not threaten aviation, the developer must establish convincingly that the facility will not handle putrescible material other than that as outlined in 2-2.d. The FAA strongly recommends against any facility other than that as outlined in 2-2.d (enclosed transfer stations). The FAA will use this information to determine if the facility will be a hazard to aviation.

c. **Putrescible-Waste Facilities.** In their effort to satisfy the EPA requirement, some putrescible-waste facility proponents may offer to undertake experimental measures to demonstrate that their proposed facility will not be a hazard to aircraft. To date, no such facility has been able to demonstrate an ability to reduce and sustain hazardous wildlife to levels that existed before the putrescible-waste landfill began operating. For this reason, demonstrations of experimental wildlife control measures may not be conducted within the separation identified in Sections 1-2 through 1-4.

4-3. OTHER LAND-USE PRACTICE CHANGES. As a matter of policy, the FAA encourages operators of public-use airports who become aware of proposed land use practice changes that may attract hazardous wildlife within 5 statute miles of their airports to promptly notify the FAA. The FAA also encourages proponents of such land use changes to notify the FAA as early in the planning process as possible. Advanced notice affords the FAA an opportunity (1) to evaluate the effect of a particular land-use change on aviation safety and (2) to support efforts by the airport sponsor to restrict the use of land next to or near the airport to uses that are compatible with the airport.

The airport operator, project proponent, or land-use operator may use FAA Form 7460-1, *Notice of Proposed Construction or Alteration*, or other suitable documents similar to FAA Form 7460-1 to notify the appropriate FAA Regional Airports Division Office. Project proponents can contact the appropriate FAA Regional Airports Division Office for assistance with the notification process.

It is helpful if the notification includes a 15-minute quadrangle map of the area identifying the location of the proposed activity. The land-use operator or project proponent should also forward specific details of the proposed land-use change or operational change or expansion. In the case of solid waste landfills, the information should include the type of waste to be handled, how the waste will be processed, and final disposal methods.

a. **Airports that have received Federal grant-in-aid assistance.** Airports that have received Federal grant-in-aid assistance are required by their grant assurances to take appropriate actions to restrict the use of land next to or near the airport to uses that are compatible with normal airport operations. The FAA recommends that airport operators to the extent practicable oppose off-airport land-use changes or practices within the separations identified in Sections 1-2 through 1-4 that may attract hazardous wildlife. Failure to do so may lead to noncompliance with applicable grant assurances. The FAA will not approve the placement of airport development projects pertaining to aircraft movement in the vicinity of hazardous wildlife attractants without appropriate mitigating measures. Increasing the intensity of wildlife control efforts is not a substitute for eliminating or reducing a proposed wildlife hazard. Airport operators should identify hazardous wildlife attractants and any associated wildlife hazards during any planning process for new airport development projects.

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APPENDIX 1. DEFINITIONS OF TERMS USED IN THIS ADVISORY CIRCULAR.

1. **GENERAL.** This appendix provides definitions of terms used throughout this AC.

   1. **Air operations area.** Any area of an airport used or intended to be used for landing, takeoff, or surface maneuvering of aircraft. An air operations area includes such paved areas or unpaved areas that are used or intended to be used for the unobstructed movement of aircraft in addition to its associated runway, taxiways, or apron.

   2. **Airport operator.** The operator (private or public) or sponsor of a public-use airport.

   3. **Approach or departure airspace.** The airspace, within 5 statute miles of an airport, through which aircraft move during landing or takeoff.

   4. **Bird balls.** High-density plastic floating balls that can be used to cover ponds and prevent birds from using the sites.

   5. **Certificate holder.** The holder of an Airport Operating Certificate issued under Title 14, Code of Federal Regulations, Part 139.

   6. **Construct a new MSWLF.** To begin to excavate, grade land, or raise structures to prepare a municipal solid waste landfill as permitted by the appropriate regulatory or permitting agency.

   7. **Detention ponds.** Storm water management ponds that hold storm water for short periods of time, a few hours to a few days.

   8. **Establish a new MSWLF.** When the first load of putrescible waste is received on-site for placement in a prepared municipal solid waste landfill.

   9. **Fly ash.** The fine, sand-like residue resulting from the complete incineration of an organic fuel source. Fly ash typically results from the combustion of coal or waste used to operate a power generating plant.

   10. **General aviation aircraft.** Any civil aviation aircraft not operating under 14 CFR Part 119, Certification: Air Carriers and Commercial Operators.

   11. **Hazardous wildlife.** Species of wildlife (birds, mammals, reptiles), including feral animals and domesticated animals not under control, that are associated with aircraft strike problems, are capable of causing structural damage to airport facilities, or act as attractants to other wildlife that pose a strike hazard

   12. **Municipal Solid Waste Landfill (MSWLF).** A publicly or privately owned discrete area of land or an excavation that receives household waste and that is not a land application unit, surface impoundment, injection well, or waste pile, as those terms are defined under 40 CFR § 257.2. An MSWLF may receive

other types wastes, such as commercial solid waste, non-hazardous sludge, small-quantity generator waste, and industrial solid waste, as defined under 40 CFR § 258.2. An MSWLF can consist of either a stand alone unit or several cells that receive household waste.

13. **New MSWLF.** A municipal solid waste landfill that was established or constructed after April 5, 2001.

14. **Piston-powered aircraft.** Fixed-wing aircraft powered by piston engines.

15. **Piston-use airport.** Any airport that does not sell Jet-A fuel for fixed-wing turbine-powered aircraft, and primarily serves fixed-wing, piston-powered aircraft. Incidental use of the airport by turbine-powered, fixed-wing aircraft would not affect this designation. However, such aircraft should not be based at the airport.

16. **Public agency.** A State or political subdivision of a State, a tax-supported organization, or an Indian tribe or pueblo (49 U.S.C. § 47102(19)).

17. **Public airport.** An airport used or intended to be used for public purposes that is under the control of a public agency; and of which the area used or intended to be used for landing, taking off, or surface maneuvering of aircraft is publicly owned (49 U.S.C. § 47102(20)).

18. **Public-use airport.** An airport used or intended to be used for public purposes, and of which the area used or intended to be used for landing, taking off, or surface maneuvering of aircraft may be under the control of a public agency or privately owned and used for public purposes (49 U.S.C. § 47102(21)).

19. **Putrescible waste.** Solid waste that contains organic matter capable of being decomposed by micro-organisms and of such a character and proportion as to be capable of attracting or providing food for birds (40 CFR §257.3-8).

20. **Putrescible-waste disposal operation.** Landfills, garbage dumps, underwater waste discharges, or similar facilities where activities include processing, burying, storing, or otherwise disposing of putrescible material, trash, and refuse.

21. **Retention ponds.** Storm water management ponds that hold water for several months.

22. **Runway protection zone (RPZ).** An area off the runway end to enhance the protection of people and property on the ground (see AC 150/5300-13). The dimensions of this zone vary with the airport design, aircraft, type of operation, and visibility minimum.

23. **Scheduled air carrier operation.** Any common carriage passenger-carrying operation for compensation or hire conducted by an air carrier or commercial

operator for which the air carrier, commercial operator, or their representative offers in advance the departure location, departure time, and arrival location. It does not include any operation that is conducted as a supplemental operation under 14 CFR Part 119 or as a public charter operation under 14 CFR Part 380 (14 CFR § 119.3).

24. **Sewage sludge.** Any solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in a treatment works. Sewage sludge includes, but is not limited to, domestic septage; scum or solids removed in primary, secondary, or advanced wastewater treatment process; and a material derived from sewage sludge. Sewage does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator or grit and screenings generated during preliminary treatment of domestic sewage in a treatment works. (40 CFR 257.2)

25. **Sludge.** Any solid, semi-solid, or liquid waste generated form a municipal, commercial or industrial wastewater treatment plant, water supply treatment plant, or air pollution control facility or any other such waste having similar characteristics and effect. (40 CFR 257.2)

26. **Solid waste.** Any garbage, refuse, sludge, from a waste treatment plant, water supply treatment plant or air pollution control facility and other discarded material, including, solid liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities, but does not include solid or dissolved materials in domestic sewage, or solid or dissolved material in irrigation return flows or industrial discharges which are point sources subject to permits under section 402 of the Federal Water Pollution Control Act, as amended (86 Stat. 880), or source, special nuclear, or by product material as defined by the Atomic Energy Act of 1954, as amended, (68 Stat. 923). (40 CFR 257.2)

27. **Turbine-powered aircraft.** Aircraft powered by turbine engines including turbojets and turboprops but excluding turbo-shaft rotary-wing aircraft.

28. **Turbine-use airport.** Any airport that sells Jet-A fuel for fixed-wing turbine-powered aircraft.

29. **Wastewater treatment facility.** Any devices and/or systems used to store, treat, recycle, or reclaim municipal sewage or liquid industrial wastes, including Publicly Owned Treatment Works (POTW), as defined by Section 212 of the Federal Water Pollution Control Act (P.L. 92-500) as amended by the Clean Water Act of 1977 (P.L. 95-576) and the Water Quality Act of 1987 (P.L. 100-4). This definition includes any pretreatment involving the reduction of the amount of pollutants, the elimination of pollutants, or the alteration of the nature of pollutant properties in wastewater prior to or in lieu of discharging or otherwise introducing such pollutants into a POTW. (See 40 CFR Section 403.3 (q), (r), & (s)).

30. **Wildlife.** Any wild animal, including without limitation any wild mammal, bird, reptile, fish, amphibian, mollusk, crustacean, arthropod, coelenterate, or other invertebrate, including any part, product, egg, or offspring thereof (50 CFR 10.12, *Taking, Possession, Transportation, Sale, Purchase, Barter, Exportation, and Importation of Wildlife and Plants*). As used in this AC, wildlife includes feral animals and domestic animals out of the control of their owners (14 CFR Part 139, Certification of Airports).

31. **Wildlife attractants.** Any human-made structure, land-use practice, or human-made or natural geographic feature that can attract or sustain hazardous wildlife within the landing or departure airspace or the airport's AOA. These attractants can include architectural features, landscaping, waste disposal sites, wastewater treatment facilities, agricultural or aquaculture activities, surface mining, or wetlands.

32. **Wildlife hazard.** A potential for a damaging aircraft collision with wildlife on or near an airport.

33. **Wildlife strike.** A wildlife strike is deemed to have occurred when:

    a. A pilot reports striking 1 or more birds or other wildlife;

    b. Aircraft maintenance personnel identify aircraft damage as having been caused by a wildlife strike;

    c. Personnel on the ground report seeing an aircraft strike 1 or more birds or other wildlife;

    d. Bird or other wildlife remains, whether in whole or in part, are found within 200 feet of a runway centerline, unless another reason for the animal's death is identified;

    e. The animal's presence on the airport had a significant negative effect on a flight (i.e., aborted takeoff, aborted landing, high-speed emergency stop, aircraft left pavement area to avoid collision with animal) (Transport Canada, Airports Group, *Wildlife Control Procedures Manual*, Technical Publication 11500E, 1994).

2. RESERVED.

FAA
Airports

Grant Assurances
Airport Sponsors

A. General.

1. These assurances shall be complied with in the performance of grant agreements for airport development, airport planning, and noise compatibility program grants for airport sponsors.

2. These assurances are required to be submitted as part of the project application by sponsors requesting funds under the provisions of Title 49, U.S.C., subtitle VII, as amended. As used herein, the term "public agency sponsor" means a public agency with control of a public-use airport; the term "private sponsor" means a private owner of a public-use airport; and the term "sponsor" includes both public agency sponsors and private sponsors.

3. Upon acceptance of this grant offer by the sponsor, these assurances are incorporated in and become part of this grant agreement.

B. Duration and Applicability.

1. **Airport development or Noise Compatibility Program Projects Undertaken by a Public Agency Sponsor**. The terms, conditions and assurances of this grant agreement shall remain in full force and effect throughout the useful life of the facilities developed or equipment acquired for an airport development or noise compatibility program project, or throughout the useful life of the project items installed within a facility under a noise compatibility program project, but in any event not to exceed twenty (20) years from the date of acceptance of a grant offer of Federal funds for the project. However, there shall be no limit on the duration of the assurances regarding Exclusive Rights and Airport Revenue so long as the airport is used as an airport. There shall be no limit on the duration of the terms, conditions, and assurances with respect to real property acquired with federal funds. Furthermore, the duration of the Civil Rights assurance shall be specified in the assurances.

2. **Airport Development or Noise Compatibility Projects Undertaken by a Private Sponsor**. The preceding paragraph 1 also applies to a private sponsor except that the useful life of project items installed within a facility or the useful life of the facilities developed or equipment acquired under an airport development or noise compatibility program project shall be no less than ten (10) years from the date of acceptance of Federal aid for the project.

3. **Airport Planning Undertaken by a Sponsor.** Unless otherwise specified in this grant agreement, only Assurances 1, 2, 3, 5, 6, 13, 18, 30, 32, 33, and 34 in section C apply to planning projects. The terms, conditions, and assurances of this grant agreement shall remain in full force and effect during the life of the project.

C. **Sponsor Certification.** The sponsor hereby assures and certifies, with respect to this grant that:

1. **General Federal Requirements.** It will comply with all applicable Federal laws, regulations, executive orders, policies, guidelines, and requirements as they relate to the application, acceptance and use of Federal funds for this project including but not limited to the following:

Federal Legislation

a. Title 49, U.S.C., subtitle VII, as amended.
b. Davis-Bacon Act - 40 U.S.C. 276(a), et seq.[1]
c. Federal Fair Labor Standards Act - 29 U.S.C. 201, et seq.
d. Hatch Act – 5 U.S.C. 1501, et seq.[2]
e. Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 Title 42 U.S.C. 4601, et seq.[1 2]
f. National Historic Preservation Act of 1966 - Section 106 - 16 U.S.C. 470(f).[1]
g. Archeological and Historic Preservation Act of 1974 - 16 U.S.C. 469 through 469c.[1]
h. Native Americans Grave Repatriation Act - 25 U.S.C. Section 3001, et seq.
i. Clean Air Act, P.L. 90-148, as amended.
j. Coastal Zone Management Act, P.L. 93-205, as amended.
k. Flood Disaster Protection Act of 1973 - Section 102(a) - 42 U.S.C. 4012a.[1]
l. Title 49, U.S.C., Section 303, (formerly known as Section 4(f))
m. Rehabilitation Act of 1973 - 29 U.S.C. 794.
n. Civil Rights Act of 1964 - Title VI - 42 U.S.C. 2000d through d-4.
o. Age Discrimination Act of 1975 - 42 U.S.C. 6101, et seq.
p. American Indian Religious Freedom Act, P.L. 95-341, as amended.
q. Architectural Barriers Act of 1968 -42 U.S.C. 4151, et seq.[1]
r. Power plant and Industrial Fuel Use Act of 1978 - Section 403- 2 U.S.C. 8373.[1]
s. Contract Work Hours and Safety Standards Act - 40 U.S.C. 327, et seq.[1]
t. Copeland Anti kickback Act - 18 U.S.C. 874.1
u. National Environmental Policy Act of 1969 - 42 U.S.C. 4321, et seq.[1]
v. Wild and Scenic Rivers Act, P.L. 90-542, as amended.
w. Single Audit Act of 1984 - 31 U.S.C. 7501, et seq.[2]
x. Drug-Free Workplace Act of 1988 - 41 U.S.C. 702 through 706.

Executive Orders

Executive Order 11246 - Equal Employment Opportunity[1]
Executive Order 11990 - Protection of Wetlands
Executive Order 11998 – Flood Plain Management
Executive Order 12372 - Intergovernmental Review of Federal Programs
Executive Order 12699 - Seismic Safety of Federal and Federally Assisted New Building Construction[1]
Executive Order 12898 - Environmental Justice

Federal Regulations

a. 14 CFR Part 13 - Investigative and Enforcement Procedures.
b. 14 CFR Part 16 - Rules of Practice For Federally Assisted Airport Enforcement Proceedings.
c. 14 CFR Part 150 - Airport noise compatibility planning.
d. 29 CFR Part 1 - Procedures for predetermination of wage rates.[1]
e. 29 CFR Part 3 - Contractors and subcontractors on public building or public work financed in whole or part by loans or grants from the United States.[1]
f. 29 CFR Part 5 - Labor standards provisions applicable to contracts covering federally financed and assisted construction (also labor standards provisions applicable to non-construction contracts subject to the Contract Work Hours and Safety Standards Act).[1]
g. 41 CFR Part 60 - Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor (Federal and federally assisted contracting requirements).[1]
h. 49 CFR Part 18 - Uniform administrative requirements for grants and cooperative agreements to state and local governments.[3]
i. 49 CFR Part 20 - New restrictions on lobbying.
j. 49 CFR Part 21 - Nondiscrimination in federally-assisted programs of the Department of Transportation - effectuation of Title VI of the Civil Rights Act of 1964.
k. 49 CFR Part 23 - Participation by Disadvantage Business Enterprise in Airport Concessions.
l. 49 CFR Part 24 - Uniform relocation assistance and real property acquisition for Federal and federally assisted programs.[1 2]
m. 49 CFR Part 26 – Participation By Disadvantaged Business Enterprises in Department of Transportation Programs.
n. 49 CFR Part 27 - Nondiscrimination on the basis of handicap in programs and activities receiving or benefiting from Federal financial assistance.[1]
o. 49 CFR Part 29 – Government wide debarment and suspension (nonprocurement) and government wide requirements for drug-free workplace (grants).
p. 49 CFR Part 30 - Denial of public works contracts to suppliers of goods and services of countries that deny procurement market access to U.S. contractors.

q. 49 CFR Part 41 - Seismic safety of Federal and federally assisted or regulated new building construction.[1]

Office of Management and Budget Circulars

a. A-87 - Cost Principles Applicable to Grants and Contracts with State and Local Governments.
b. A-133 - Audits of States, Local Governments, and Non-Profit Organizations

[1] These laws do not apply to airport planning sponsors.
[2] These laws do not apply to private sponsors.
[3] 49 CFR Part 18 and OMB Circular A-87 contain requirements for State and Local Governments receiving Federal assistance. Any requirement levied upon State and Local Governments by this regulation and circular shall also be applicable to private sponsors receiving Federal assistance under Title 49, United States Code.

Specific assurances required to be included in grant agreements by any of the above laws, regulations or circulars are incorporated by reference in this grant agreement.

2. **Responsibility and Authority of the Sponsor.**

a. **Public Agency Sponsor:** It has legal authority to apply for this grant, and to finance and carry out the proposed project; that a resolution, motion or similar action has been duly adopted or passed as an official act of the applicant's governing body authorizing the filing of the application, including all understandings and assurances contained therein, and directing and authorizing the person identified as the official representative of the applicant to act in connection with the application and to provide such additional information as may be required.

b. **Private Sponsor:** It has legal authority to apply for this grant and to finance and carry out the proposed project and comply with all terms, conditions, and assurances of this grant agreement. It shall designate an official representative and shall in writing direct and authorize that person to file this application, including all understandings and assurances contained therein; to act in connection with this application; and to provide such additional information as may be required.

3. **Sponsor Fund Availability.** It has sufficient funds available for that portion of the project costs which are not to be paid by the United States. It has sufficient funds available to assure operation and maintenance of items funded under this grant agreement which it will own or control.

4. **Good Title.**

a. It, a public agency or the Federal government, holds good title, satisfactory to the Secretary, to the landing area of the airport or site thereof, or will give assurance satisfactory to the Secretary that good title will be acquired.

b. For noise compatibility program projects to be carried out on the property of the sponsor, it holds good title satisfactory to the Secretary to that portion of the property upon which Federal funds will be expended or will give assurance to the Secretary that good title will be obtained.

5. **Preserving Rights and Powers.**

a. It will not take or permit any action which would operate to deprive it of any of the rights and powers necessary to perform any or all of the terms, conditions, and assurances in this grant agreement without the written approval of the Secretary, and will act promptly to acquire, extinguish or modify any outstanding rights or claims of right of others which would interfere with such performance by the sponsor. This shall be done in a manner acceptable to the Secretary.

b. It will not sell, lease, encumber, or otherwise transfer or dispose of any part of its title or other interests in the property shown on Exhibit A to this application or, for a noise compatibility program project, that portion of the property upon which Federal funds have been expended, for the duration of the terms, conditions, and assurances in this grant agreement without approval by the Secretary. If the transferee is found by the Secretary to be eligible under Title 49, United States Code, to assume the obligations of this grant agreement and to have the power, authority, and financial resources to carry out all such obligations, the sponsor shall insert in the contract or document transferring or disposing of the sponsor's interest, and make binding upon the transferee all of the terms, conditions, and assurances contained in this grant agreement.

c. For all noise compatibility program projects which are to be carried out by another unit of local government or are on property owned by a unit of local government other than the sponsor, it will enter into an agreement with that government. Except as otherwise specified by the Secretary, that agreement shall obligate that government to the same terms, conditions, and assurances that would be applicable to it if it applied directly to the FAA for a grant to undertake the noise compatibility program project. That agreement and changes thereto must be satisfactory to the Secretary. It will take steps to enforce this agreement against the local government if there is substantial non-compliance with the terms of the agreement.

d. For noise compatibility program projects to be carried out on privately owned property, it will enter into an agreement with the owner of that property which includes provisions specified by the Secretary. It will take steps to enforce this agreement against the property owner whenever there is substantial non-compliance with the terms of the agreement.

e. If the sponsor is a private sponsor, it will take steps satisfactory to the Secretary to ensure that the airport will continue to function as a public-use airport in accordance with these assurances for the duration of these assurances.

f. If an arrangement is made for management and operation of the airport by any agency or person other than the sponsor or an employee of the sponsor, the sponsor will reserve sufficient rights and authority to insure that the airport will be operated and maintained in accordance Title 49, United States Code, the regulations and the terms, conditions and assurances in this grant agreement and shall insure that such arrangement also requires compliance therewith.

g. Sponsors of commercial service airports will not permit or enter into any arrangement that results in permission for the owner or tenant of a property used as a residence, or zoned for residential use, to taxi an aircraft between that property and any location on airport. Sponsors of general aviation airports entering into any arrangement that results in permission for the owner of residential real property adjacent to or near the airport must comply with the requirements of Sec. 136 of Public Law 112-95 and the sponsor assurances.

6. **Consistency with Local Plans.** The project is reasonably consistent with plans (existing at the time of submission of this application) of public agencies that are authorized by the State in which the project is located to plan for the development of the area surrounding the airport.

7. **Consideration of Local Interest.** It has given fair consideration to the interest of communities in or near where the project may be located.

8. **Consultation with Users.** In making a decision to undertake any airport development project under Title 49, United States Code, it has undertaken reasonable consultations with affected parties using the airport at which project is proposed.

9. **Public Hearings.** In projects involving the location of an airport, an airport runway, or a major runway extension, it has afforded the opportunity for public hearings for the purpose of considering the economic, social, and environmental effects of the airport or runway location and its consistency with goals and objectives of such planning as has been carried out by the community and it shall, when requested by the Secretary, submit a copy of the transcript of such hearings to the Secretary. Further, for such projects, it has on its management board either voting representation from the communities where the project is located or has advised the communities that they have the right to petition the Secretary concerning a proposed project.

10. **Air and Water Quality Standards.** In projects involving airport location, a major runway extension, or runway location it will provide for the Governor of the state in which the project is located to certify in writing to the Secretary that the project will be located, designed, constructed, and operated so as to comply with applicable air and water quality standards. In any case where such standards have not been approved and where applicable air and water quality standards have been promulgated by the Administrator of the Environmental Protection Agency, certification shall be obtained from such Administrator. Notice of certification or refusal to certify shall be provided within sixty days after the project application has been received by the Secretary.

11. **Pavement Preventive Maintenance.** With respect to a project approved after January 1, 1995, for the replacement or reconstruction of pavement at the airport,

it assures or certifies that it has implemented an effective airport pavement maintenance-management program and it assures that it will use such program for the useful life of any pavement constructed, reconstructed or repaired with Federal financial assistance at the airport. It will provide such reports on pavement condition and pavement management programs as the Secretary determines may be useful.

12. **Terminal Development Prerequisites.** For projects which include terminal development at a public use airport, as defined in Title 49, it has, on the date of submittal of the project grant application, all the safety equipment required for certification of such airport under section 44706 of Title 49, United States Code, and all the security equipment required by rule or regulation, and has provided for access to the passenger enplaning and deplaning area of such airport to passengers enplaning and deplaning from aircraft other than air carrier aircraft.

13. **Accounting System, Audit, and Record Keeping Requirements.**

    a. It shall keep all project accounts and records which fully disclose the amount and disposition by the recipient of the proceeds of this grant, the total cost of the project in connection with which this grant is given or used, and the amount or nature of that portion of the cost of the project supplied by other sources, and such other financial records pertinent to the project. The accounts and records shall be kept in accordance with an accounting system that will facilitate an effective audit in accordance with the Single Audit Act of 1984.

    b. It shall make available to the Secretary and the Comptroller General of the United States, or any of their duly authorized representatives, for the purpose of audit and examination, any books, documents, papers, and records of the recipient that are pertinent to this grant. The Secretary may require that an appropriate audit be conducted by a recipient. In any case in which an independent audit is made of the accounts of a sponsor relating to the disposition of the proceeds of a grant or relating to the project in connection with which this grant was given or used, it shall file a certified copy of such audit with the Comptroller General of the United States not later than six (6) months following the close of the fiscal year for which the audit was made.

14. **Minimum Wage Rates.** It shall include, in all contracts in excess of $2,000 for work on any projects funded under this grant agreement which involve labor, provisions establishing minimum rates of wages, to be predetermined by the Secretary of Labor, in accordance with the Davis-Bacon Act, as amended (40 U.S.C. 276a-276a-5), which contractors shall pay to skilled and unskilled labor, and such minimum rates shall be stated in the invitation for bids and shall be included in proposals or bids for the work.

15. **Veteran's Preference.** It shall include in all contracts for work on any project funded under this grant agreement which involve labor, such provisions as are necessary to insure that, in the employment of labor (except in executive, administrative, and supervisory positions), preference shall be given to Vietnam

era veterans, Persian Gulf veterans, Afghanistan-Iraq war veterans, disabled veterans, and small business concerns owned and controlled by disabled veterans as defined in Section 47112 of Title 49, United States Code. However, this preference shall apply only where the individuals are available and qualified to perform the work to which the employment relates.

16. **Conformity to Plans and Specifications.** It will execute the project subject to plans, specifications, and schedules approved by the Secretary. Such plans, specifications, and schedules shall be submitted to the Secretary prior to commencement of site preparation, construction, or other performance under this grant agreement, and, upon approval of the Secretary, shall be incorporated into this grant agreement. Any modification to the approved plans, specifications, and schedules shall also be subject to approval of the Secretary, and incorporated into this grant agreement.

17. **Construction Inspection and Approval.** It will provide and maintain competent technical supervision at the construction site throughout the project to assure that the work conforms to the plans, specifications, and schedules approved by the Secretary for the project. It shall subject the construction work on any project contained in an approved project application to inspection and approval by the Secretary and such work shall be in accordance with regulations and procedures prescribed by the Secretary. Such regulations and procedures shall require such cost and progress reporting by the sponsor or sponsors of such project as the Secretary shall deem necessary.

18. **Planning Projects.** In carrying out planning projects:

    a. It will execute the project in accordance with the approved program narrative contained in the project application or with the modifications similarly approved.
    b. It will furnish the Secretary with such periodic reports as required pertaining to the planning project and planning work activities.
    c. It will include in all published material prepared in connection with the planning project a notice that the material was prepared under a grant provided by the United States.
    d. It will make such material available for examination by the public, and agrees that no material prepared with funds under this project shall be subject to copyright in the United States or any other country.
    e. It will give the Secretary unrestricted authority to publish, disclose, distribute, and otherwise use any of the material prepared in connection with this grant.
    f. It will grant the Secretary the right to disapprove the sponsor's employment of specific consultants and their subcontractors to do all or any part of this project as well as the right to disapprove the proposed scope and cost of professional services.
    g. It will grant the Secretary the right to disapprove the use of the sponsor's employees to do all or any part of the project.
    h. It understands and agrees that the Secretary's approval of this project grant or the Secretary's approval of any planning material developed as part of

this grant does not constitute or imply any assurance or commitment on the part of the Secretary to approve any pending or future application for a Federal airport grant.

19. Operation and Maintenance.

a. The airport and all facilities which are necessary to serve the aeronautical users of the airport, other than facilities owned or controlled by the United States, shall be operated at all times in a safe and serviceable condition and in accordance with the minimum standards as may be required or prescribed by applicable Federal, state and local agencies for maintenance and operation. It will not cause or permit any activity or action thereon which would interfere with its use for airport purposes. It will suitably operate and maintain the airport and all facilities thereon or connected therewith, with due regard to climatic and flood conditions. Any proposal to temporarily close the airport for non-aeronautical purposes must first be approved by the Secretary. In furtherance of this assurance, the sponsor will have in effect arrangements for-

1) Operating the airport's aeronautical facilities whenever required;
2) Promptly marking and lighting hazards resulting from airport conditions, including temporary conditions; and
3) Promptly notifying airmen of any condition affecting aeronautical use of the airport. Nothing contained herein shall be construed to require that the airport be operated for aeronautical use during temporary periods when snow, flood or other climatic conditions interfere with such operation and maintenance. Further, nothing herein shall be construed as requiring the maintenance, repair, restoration, or replacement of any structure or facility which is substantially damaged or destroyed due to an act of God or other condition or circumstance beyond the control of the sponsor.

b. It will suitably operate and maintain noise compatibility program items that it owns or controls upon which Federal funds have been expended.

20. Hazard Removal and Mitigation. It will take appropriate action to assure that such terminal airspace as is required to protect instrument and visual operations to the airport (including established minimum flight altitudes) will be adequately cleared and protected by removing, lowering, relocating, marking, or lighting or otherwise mitigating existing airport hazards and by preventing the establishment or creation of future airport hazards.

21. Compatible Land Use. It will take appropriate action, to the extent reasonable, including the adoption of zoning laws, to restrict the use of land adjacent to or in the immediate vicinity of the airport to activities and purposes compatible with normal airport operations, including landing and takeoff of aircraft. In addition, if the project is for noise compatibility program implementation, it will not cause or permit any change in land use, within its jurisdiction, that will reduce its compatibility, with respect to the airport, of the noise compatibility program measures upon which Federal funds have been expended.

22. Economic Nondiscrimination.

a. It will make the airport available as an airport for public use on reasonable terms and without unjust discrimination to all types, kinds and classes of aeronautical activities, including commercial aeronautical activities offering services to the public at the airport.

b. In any agreement, contract, lease, or other arrangement under which a right or privilege at the airport is granted to any person, firm, or corporation to conduct or to engage in any aeronautical activity for furnishing services to the public at the airport, the sponsor will insert and enforce provisions requiring the contractor to-

   1) furnish said services on a reasonable, and not unjustly discriminatory, basis to all users thereof, and

   2) charge reasonable, and not unjustly discriminatory, prices for each unit or service, provided that the contractor may be allowed to make reasonable and nondiscriminatory discounts, rebates, or other similar types of price reductions to volume purchasers.

c. Each fixed-based operator at the airport shall be subject to the same rates, fees, rentals, and other charges as are uniformly applicable to all other fixed-based operators making the same or similar uses of such airport and utilizing the same or similar facilities.

d. Each air carrier using such airport shall have the right to service itself or to use any fixed-based operator that is authorized or permitted by the airport to serve any air carrier at such airport.

e. Each air carrier using such airport (whether as a tenant, non tenant, or subtenant of another air carrier tenant) shall be subject to such nondiscriminatory and substantially comparable rules, regulations, conditions, rates, fees, rentals, and other charges with respect to facilities directly and substantially related to providing air transportation as are applicable to all such air carriers which make similar use of such airport and utilize similar facilities, subject to reasonable classifications such as tenants or non tenants and signatory carriers and non signatory carriers. Classification or status as tenant or signatory shall not be unreasonably withheld by any airport provided an air carrier assumes obligations substantially similar to those already imposed on air carriers in such classification or status.

f. It will not exercise or grant any right or privilege which operates to prevent any person, firm, or corporation operating aircraft on the airport from performing any services on its own aircraft with its own employees [including, but not limited to maintenance, repair, and fueling] that it may choose to perform.

g. In the event the sponsor itself exercises any of the rights and privileges referred to in this assurance, the services involved will be provided on the same conditions as would apply to the furnishing of such services by commercial aeronautical service providers authorized by the sponsor under these provisions.

h. The sponsor may establish such reasonable, and not unjustly discriminatory, conditions to be met by all users of the airport as may be necessary for the safe and efficient operation of the airport.

i. The sponsor may prohibit or limit any given type, kind or class of aeronautical use of the airport if such action is necessary for the safe operation of the airport or necessary to serve the civil aviation needs of the public.

23. **Exclusive Rights.** It will permit no exclusive right for the use of the airport by any person providing, or intending to provide, aeronautical services to the public. For purposes of this paragraph, the providing of the services at an airport by a single fixed-based operator shall not be construed as an exclusive right if both of the following apply:

a. It would be unreasonably costly, burdensome, or impractical for more than one fixed-based operator to provide such services, and

b. If allowing more than one fixed-based operator to provide such services would require the reduction of space leased pursuant to an existing agreement between such single fixed-based operator and such airport. It further agrees that it will not, either directly or indirectly, grant or permit any person, firm, or corporation, the exclusive right at the airport to conduct any aeronautical activities, including, but not limited to charter flights, pilot training, aircraft rental and sightseeing, aerial photography, crop dusting, aerial advertising and surveying, air carrier operations, aircraft sales and services, sale of aviation petroleum products whether or not conducted in conjunction with other aeronautical activity, repair and maintenance of aircraft, sale of aircraft parts, and any other activities which because of their direct relationship to the operation of aircraft can be regarded as an aeronautical activity, and that it will terminate any exclusive right to conduct an aeronautical activity now existing at such an airport before the grant of any assistance under Title 49, United States Code.

24. **Fee and Rental Structure.** It will maintain a fee and rental structure for the facilities and services at the airport which will make the airport as self-sustaining as possible under the circumstances existing at the particular airport, taking into account such factors as the volume of traffic and economy of collection. No part of the Federal share of an airport development, airport planning or noise compatibility project for which a grant is made under Title 49, United States Code, the Airport and Airway Improvement Act of 1982, the Federal Airport Act or the Airport and Airway Development Act of 1970 shall be included in the rate basis in establishing fees, rates, and charges for users of that airport.

25. **Airport Revenues.**

a. All revenues generated by the airport and any local taxes on aviation fuel established after December 30, 1987, will be expended by it for the capital or operating costs of the airport; the local airport system; or other local facilities which are owned or operated by the owner or operator of the airport and which are directly and substantially related to the actual air transportation of passengers or property; or for noise mitigation purposes on or off the airport. The following exceptions apply to this paragraph:

1) If covenants or assurances in debt obligations issued before September 3, 1982, by the owner or operator of the airport, or provisions enacted before September 3, 1982, in governing statutes controlling the owner or operator's financing, provide for the use of the revenues from any of the airport owner or operator's facilities, including the airport, to support not only the airport but also the airport owner or operator's general debt obligations or other facilities, then this limitation on the use of all revenues generated by the airport (and, in the case of a public airport, local taxes on aviation fuel) shall not apply.

2) If the Secretary approves the sale of a privately owned airport to a public sponsor and provides funding for any portion of the public sponsor's acquisition of land, this limitation on the use of all revenues generated by the sale shall not apply to certain proceeds from the sale. This is conditioned on repayment to the Secretary by the private owner of an amount equal to the remaining unamortized portion (amortized over a 20-year period) of any airport improvement grant made to the private owner for any purpose other than land acquisition on or after October 1, 1996, plus an amount equal to the federal share of the current fair market value of any land acquired with an airport improvement grant made to that airport on or after October 1, 1996.

3) Certain revenue derived from or generated by mineral extraction, production, lease, or other means at a general aviation airport (as defined at Section 47102 of title 49 United States Code), if the FAA determines the airport sponsor meets the requirements set forth in Sec. 813 of Public Law 112-95.

b. As part of the annual audit required under the Single Audit Act of 1984, the sponsor will direct that the audit will review, and the resulting audit report will provide an opinion concerning, the use of airport revenue and taxes in paragraph (a), and indicating whether funds paid or transferred to the owner or operator are paid or transferred in a manner consistent with Title 49, United States Code and any other applicable provision of law, including any regulation promulgated by the Secretary or Administrator.

c. Any civil penalties or other sanctions will be imposed for violation of this assurance in accordance with the provisions of Section 47107 of Title 49, United States Code.

26. Reports and Inspections. It will:

a. submit to the Secretary such annual or special financial and operations reports as the Secretary may reasonably request and make such reports available to the public; make available to the public at reasonable times and places a report of the airport budget in a format prescribed by the Secretary;

b. for airport development projects, make the airport and all airport records and documents affecting the airport, including deeds, leases, operation and use agreements, regulations and other instruments, available for inspection by any duly authorized agent of the Secretary upon reasonable request;

c. for noise compatibility program projects, make records and documents relating to the project and continued compliance with the terms, conditions, and assurances of this grant agreement including deeds, leases, agreements, regulations, and other instruments, available for inspection by any duly authorized agent of the Secretary upon reasonable request; and

d. in a format and time prescribed by the Secretary, provide to the Secretary and make available to the public following each of its fiscal years, an annual report listing in detail:

    1) all amounts paid by the airport to any other unit of government and the purposes for which each such payment was made; and

    2) all services and property provided by the airport to other units of government and the amount of compensation received for provision of each such service and property.

27. **Use by Government Aircraft.** It will make available all of the facilities of the airport developed with Federal financial assistance and all those usable for landing and takeoff of aircraft to the United States for use by Government aircraft in common with other aircraft at all times without charge, except, if the use by Government aircraft is substantial, charge may be made for a reasonable share, proportional to such use, for the cost of operating and maintaining the facilities used. Unless otherwise determined by the Secretary, or otherwise agreed to by the sponsor and the using agency, substantial use of an airport by Government aircraft will be considered to exist when operations of such aircraft are in excess of those which, in the opinion of the Secretary, would unduly interfere with use of the landing areas by other authorized aircraft, or during any calendar month that –

a. Five (5) or more Government aircraft are regularly based at the airport or on land adjacent thereto; or

b. The total number of movements (counting each landing as a movement) of Government aircraft is 300 or more, or the gross accumulative weight of Government aircraft using the airport (the total movement of Government aircraft multiplied by gross weights of such aircraft) is in excess of five million pounds.

28. **Land for Federal Facilities.** It will furnish without cost to the Federal Government for use in connection with any air traffic control or air navigation activities, or weather-reporting and communication activities related to air traffic control, any areas of land or water, or estate therein, or rights in buildings of the sponsor as the Secretary considers necessary or desirable for construction, operation, and maintenance at Federal expense of space or facilities for such

purposes. Such areas or any portion thereof will be made available as provided herein within four months after receipt of a written request from the Secretary.

29. Airport Layout Plan.

a. It will keep up to date at all times an airport layout plan of the airport showing (1) boundaries of the airport and all proposed additions thereto, together with the boundaries of all offsite areas owned or controlled by the sponsor for airport purposes and proposed additions thereto; (2) the location and nature of all existing and proposed airport facilities and structures (such as runways, taxiways, aprons, terminal buildings, hangars and roads), including all proposed extensions and reductions of existing airport facilities; (3) the location of all existing and proposed nonaviation areas and of all existing improvements thereon; and (4) all proposed and existing access points used to taxi aircraft across the airport's property boundary. Such airport layout plans and each amendment, revision, or modification thereof, shall be subject to the approval of the Secretary which approval shall be evidenced by the signature of a duly authorized representative of the Secretary on the face of the airport layout plan. The sponsor will not make or permit any changes or alterations in the airport or any of its facilities which are not in conformity with the airport layout plan as approved by the Secretary and which might, in the opinion of the Secretary, adversely affect the safety, utility or efficiency of the airport.

b. If a change or alteration in the airport or the facilities is made which the Secretary determines adversely affects the safety, utility, or efficiency of any federally owned, leased, or funded property on or off the airport and which is not in conformity with the airport layout plan as approved by the Secretary, the owner or operator will, if requested, by the Secretary (1) eliminate such adverse effect in a manner approved by the Secretary; or (2) bear all costs of relocating such property (or replacement thereof) to a site acceptable to the Secretary and all costs of restoring such property (or replacement thereof) to the level of safety, utility, efficiency, and cost of operation existing before the unapproved change in the airport or its facilities except in the case of a relocation or replacement of an existing airport facility due to a change in the Secretary's design standards beyond the control of the airport sponsor.

30. Civil Rights. It will comply with such rules as are promulgated to assure that no person shall, on the grounds of race, creed, color, national origin, sex, age, or handicap be excluded from participating in any activity conducted with or benefiting from funds received from this grant. This assurance obligates the sponsor for the period during which Federal financial assistance is extended to the program, except where Federal financial assistance is to provide, or is in the form of personal property or real property or interest therein or structures or improvements thereon in which case the assurance obligates the sponsor or any transferee for the longer of the following periods: (a) the period during which the property is used for a purpose for which Federal financial assistance is extended, or for another purpose involving the provision of similar services or benefits, or

(b) the period during which the sponsor retains ownership or possession of the property.

31. **Disposal of Land.**

a. For land purchased under a grant for airport noise compatibility purposes, including land serving as a noise buffer, it will dispose of the land, when the land is no longer needed for such purposes, at fair market value, at the earliest practicable time. That portion of the proceeds of such disposition which is proportionate to the United States' share of acquisition of such land will be, at the discretion of the Secretary, (1) reinvested in another project at the airport, or (2) transferred to another eligible airport as prescribed by the Secretary. The Secretary shall give preference to the following, in descending order, (1) reinvestment in an approved noise compatibility project, (2) reinvestment in an approved project that is eligible for grant funding under Section 47117(e) of title 49 United States Code, (3) reinvestment in an approved airport development project that is eligible for grant funding under Sections 47114, 47115, or 47117 of title 49 United States Code, (4) transferred to an eligible sponsor of another public airport to be reinvested in an approved noise compatibility project at that airport, and (5) paid to the Secretary for deposit in the Airport and Airway Trust Fund. If land acquired under a grant for noise compatibility purposes is leased at fair market value and consistent with noise buffering purposes, the lease will not be considered a disposal of the land. Revenues derived from such a lease may be used for an approved airport development project that would otherwise be eligible for grant funding or any permitted use of airport revenue.

b. For land purchased under a grant for airport development purposes (other than noise compatibility), it will, when the land is no longer needed for airport purposes, dispose of such land at fair market value or make available to the Secretary an amount equal to the United States' proportionate share of the fair market value of the land. That portion of the proceeds of such disposition which is proportionate to the United States' share of the cost of acquisition of such land will, (1) upon application to the Secretary, be reinvested or transferred to another eligible airport as prescribed by the Secretary. The Secretary shall give preference to the following, in descending order: (1) reinvestment in an approved noise compatibility project, (2) reinvestment in an approved project that is eligible for grant funding under Section 47117(e) of title 49 United States Code, (3) reinvestment in an approved airport development project that is eligible for grant funding under Sections 47114, 47115, or 47117 of title 49 United States Code, (4) transferred to an eligible sponsor of another public airport to be reinvested in an approved noise compatibility project at that airport, and (5) paid to the Secretary for deposit in the Airport and Airway Trust Fund.

c. Land shall be considered to be needed for airport purposes under this assurance if (1) it may be needed for aeronautical purposes (including runway protection zones) or serve as noise buffer land, and (2) the revenue from interim uses of such land contributes to the financial self-sufficiency of the airport. Further, land purchased with a grant received by an airport operator or owner before December 31, 1987, will be considered to be needed for airport purposes if the Secretary or Federal agency making such grant before December 31, 1987, was notified by the operator or owner of the uses of such land, did not object to such use, and the land continues to be used for that purpose, such use having commenced no later than December 15, 1989.

d. Disposition of such land under (a) (b) or (c) will be subject to the retention or reservation of any interest or right therein necessary to ensure that such land will only be used for purposes which are compatible with noise levels associated with operation of the airport.

32. **Engineering and Design Services.** It will award each contract, or sub-contract for program management, construction management, planning studies, feasibility studies, architectural services, preliminary engineering, design, engineering, surveying, mapping or related services with respect to the project in the same manner as a contract for architectural and engineering services is negotiated under Title IX of the Federal Property and Administrative Services Act of 1949 or an equivalent qualifications-based requirement **prescribed** for or by the sponsor of the airport.

33. **Foreign Market Restrictions.** It will not allow funds provided under this grant to be used to fund any project which uses any product or service of a foreign country during the period in which such foreign country is listed by the United States Trade Representative as denying fair and equitable market opportunities for products and suppliers of the United States in procurement and construction.

34. **Policies, Standards, and Specifications.** It will carry out the project in accordance with policies, standards, and specifications approved by the Secretary including but not limited to the advisory circulars listed in the Current FAA Advisory Circulars for AIP projects, dated ____________________ (the latest approved version as of this grant offer) and included in this grant, and in accordance with applicable state policies, standards, and specifications approved by the Secretary.

35. **Relocation and Real Property Acquisition.** (1) It will be guided in acquiring real property, to the greatest extent practicable under State law, by the land acquisition policies in Subpart B of 49 CFR Part 24 and will pay or reimburse property owners for necessary expenses as specified in Subpart B. (2) It will provide a relocation assistance program offering the services described in Subpart C and fair and reasonable relocation payments and assistance to displaced persons as required in Subpart D and E of 49 CFR Part 24. (3) It will make available within a reasonable period of time prior to displacement, comparable replacement dwellings to displaced persons in accordance with Subpart E of 49 CFR Part 24.

36. **Access By Intercity Buses**. The airport owner or operator will permit, to the maximum extent practicable, intercity buses or other modes of transportation to

have access to the airport; however, it has no obligation to fund special facilities for intercity buses or for other modes of transportation.

37. **Disadvantaged Business Enterprises.** The recipient shall not discriminate on the basis of race, color, national origin or sex in the award and performance of any DOT-assisted contract or in the administration of its DBE program or the requirements of 49 CFR Part 26. The Recipient shall take all necessary and reasonable steps under 49 CFR Part 26 to ensure non discrimination in the award and administration of DOT-assisted contracts. The recipient's DBE program, as required by 49 CFR Part 26, and as approved by DOT, is incorporated by reference in this agreement. Implementation of this program is a legal obligation and failure to carry out its terms shall be treated as a violation of this agreement. Upon notification to the recipient of its failure to carry out its approved program, the Department may impose sanctions as provided for under Part 26 and may, in appropriate cases, refer the matter for enforcement under 18 U.S.C. 1001 and/or the Program Fraud Civil Remedies Act of 1986 (31 U.S.C. 3801).

38. **Hangar Construction.** If the airport owner or operator and a person who owns an aircraft agree that a hangar is to be constructed at the airport for the aircraft at the aircraft owner's expense, the airport owner or operator will grant to the aircraft owner for the hangar a long term lease that is subject to such terms and conditions on the hangar as the airport owner or operator may impose.

39. **Competitive Access.**

    a. If the airport owner or operator of a medium or large hub airport (as defined in section 47102 of title 49, U.S.C.) has been unable to accommodate one or more requests by an air carrier for access to gates or other facilities at that airport in order to allow the air carrier to provide service to the airport or to expand service at the airport, the airport owner or operator shall transmit a report to the Secretary that-

        1) Describes the requests;
        2) Provides an explanation as to why the requests could not be accommodated; and
        3) Provides a time frame within which, if any, the airport will be able to accommodate the requests.

    b. Such report shall be due on either February 1 or August 1 of each year if the airport has been unable to accommodate the request(s) in the six month period prior to the applicable due date.

Appendix C
California Natural Diversity Database (CNDDB), Rarefind 4 Electronic Database

ESA

CALIFORNIA DEPARTMENT OF FISH and WILDLIFE

CALIFORNIA NATURAL DIVERSITY DATABASE (CNDDB)

- **RareFind 4**
- Data Updates
- About

Metadata: Description of CNDDB fields

Data Portal » Species & Vegetation » California Natural Diversity Database (CNDDB) » RareFind 4

California Natural Diversity Database - RareFind 4 for Commercial Subscribers

Select Criteria | View Element Results | View Occurrence Results | Reports

All reports are based on the query results.

Search Criteria: Quad is (Gregg (3611988) or Lanes Bridge (3611987) or Friant (3611986) or Academy (3611985) or Humphreys Station (3611984) or Herndon (3611978) or Fresno North (3611977) or Fresno South (3611967) or Malaga (3611966) or Sanger (3611965) or Wahtoke (3611964) or Raisin (3611958) or Reedley (3611954) or Trimmer (3611983) or Pine Flat Dam (3611973) or Orange Cove North (3611963) or Orange Cove South (3611953) or Little Table Mtn. (3711917) or Millerton Lake West (3711916) or Millerton Lake East (3711915) or Selma (3611955))

Your search returned 392 occurrences from a total of 75,104 occurrences and 62 elements from a total of 3,839.

- List by Scientific Name— Listing of the selected elements by scientific name.
- List by Common Name— Listing of the selected elements by common name.
- List by Element Code— Listing of the selected elements by element code.
- Full Report with Sources— Listing of detailed element occurrence information including associated sources. WARNING: This report may take a long time to generate or may fail when the selected set of element occurrences is very large.
- Multiple Occurrences per Page— Listing of detailed element occurrence information in a compact format without source information.
- Summary Table Report— Summary of the selected occurrences' ranks, population status and presence grouped by element information.
- Source Report by Element Occurrence Number— Listing of the data sources for the selected element occurrences by occurrence number.
- List of all sources used by Element— A listing of all source documents used to map the occurrences for an element. WARNING: This report is intended for queries of a single element. This report will be very large if used with queries where many elements have been selected.

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Agelaius tricolor tricolored blackbird	ABPBXB0020	None	None	G2G3	S2	SSC
Ambystoma californiense California tiger salamander	AAAAA01180	Threatened	Threatened	G2G3	S2S3	SSC
Antrozous pallidus pallid bat	AMACC10010	None	None	G5	S3	SSC
Aquila chrysaetos golden eagle	ABNKC22010	None	None	G5	S3	FP
Athene cunicularia burrowing owl	ABNSB10010	None	None	G4	S2	SSC
Atriplex minuscula lesser saltscale	PDCHE042M0	None	None	G2	S2	1B.1
Branchinecta lynchi vernal pool fairy shrimp	ICBRA03030	Threatened	None	G3	S2S3	
Branchinecta mesovallensis midvalley fairy shrimp	ICBRA03150	None	None	G2	S2	
Buteo swainsoni Swainson's hawk	ABNKC19070	None	Threatened	G5	S2	
Calicina dimorphica Watts Valley harvestman	ILARAU8050	None	None	G1	S1	
Calicina mesaensis Table Mountain harvestman	ILARAU8070	None	None	G1	S1	
Carpenteria californica tree-anemone	PDHDR04010	None	Threatened	G1?	S1?	1B.2
Castilleja campestris var. succulenta succulent owl's-clover	PDSCR0D3Z1	Threatened	Endangered	G4?T2	S2	1B.2
Caulanthus californicus California jewel-flower	PDBRA31010	Endangered	Endangered	G1	S1	1B.1
Chrysis tularensis Tulare cuckoo wasp	IIHYM72010	None	None	G1G2	S1S2	
Coccyzus americanus occidentalis western yellow-billed cuckoo	ABNRB02022	Candidate	Endangered	G5T3Q	S1	
Desmocerus californicus dimorphus valley elderberry longhorn beetle	IICOL48011	Threatened	None	G3T2	S2	
Dipodomys nitratoides exilis Fresno kangaroo rat	AMAFD03151	Endangered	Endangered	G3T1	S1	
Downingia pusilla dwarf downingia	PDCAM060C0	None	None	G2	S2	2B.2
Efferia antiochi Antioch efferian robberfly	IIDIP07010	None	None	G1G3	S1S3	
Emys marmorata western pond turtle	ARAAD02030	None	None	G3G4	S3	SSC

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Eremophila alpestris actia California horned lark	ABPAT02011	None	None	G5T3Q	S3	WL
Eriastrum hooveri Hoover's eriastrum	PDPLM03070	Delisted	None	G3	S3.2	4.2
Eriogonum nudum var. regirivum Kings River buckwheat	PDPGN0849F	None	None	G5T2	S2	1B.2
Eryngium spinosepalum spiny-sepaled button-celery	PDAPI0Z0Y0	None	None	G2	S2.2	1B.2
Euderma maculatum spotted bat	AMACC07010	None	None	G4	S2S3	SSC
Eumops perotis californicus western mastiff bat	AMACD02011	None	None	G5T4	S3?	SSC
Falco mexicanus prairie falcon	ABNKD06090	None	None	G5	S3	WL
Gratiola heterosepala Boggs Lake hedge-hyssop	PDSCR0R060	None	Endangered	G2	S2	1B.2
Great Valley Mixed Riparian Forest Great Valley Mixed Riparian Forest	CTT61420CA	None	None	G2	S2.2	
Imperata brevifolia California satintail	PMPOA3D020	None	None	G2	S2.1	2B.1
Lagophylla dichotoma forked hare-leaf	PDAST5J020	None	None	G1	S1	1B.1
Lasiurus cinereus hoary bat	AMACC05030	None	None	G5	S4?	
Lepidurus packardi vernal pool tadpole shrimp	ICBRA10010	Endangered	None	G3	S2S3	
Leptosiphon serrulatus Madera leptosiphon	PDPLM09130	None	None	G1?	S1?	1B.2
Linderiella occidentalis California linderiella	ICBRA06010	None	None	G3	S2S3	
Lupinus citrinus var. citrinus orange lupine	PDFAB2B103	None	None	G2T2	S2.2	1B.2
Lytta moesta moestan blister beetle	IICOL4C020	None	None	G2	S2	
Lytta molesta molestan blister beetle	IICOL4C030	None	None	G2	S2	
Metapogon hurdi Hurd's metapogon robberfly	IIDIP08010	None	None	G1G3	S1S3	
Mimulus gracilipes slender-stalked monkeyflower	PDSCR1B1C0	None	None	G2G3	S2S3	1B.2
Mylopharodon conocephalus hardhead	AFCJB25010	None	None	G3	S3	SSC

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Northern Basalt Flow Vernal Pool Northern Basalt Flow Vernal Pool	CTT44131CA	None	None	G3	S2.2	
Northern Claypan Vernal Pool Northern Claypan Vernal Pool	CTT44120CA	None	None	G1	S1.1	
Northern Hardpan Vernal Pool Northern Hardpan Vernal Pool	CTT44110CA	None	None	G3	S3.1	
Oravelia pege Dry Creek cliff strider bug	IIHEM14010	None	None	G1	S1	
Orcuttia inaequalis San Joaquin Valley Orcutt grass	PMPOA4G060	Threatened	Endangered	G1	S1	1B.1
Orcuttia pilosa hairy Orcutt grass	PMPOA4G040	Endangered	Endangered	G1	S1	1B.1
Perognathus inornatus inornatus San Joaquin pocket mouse	AMAFD01061	None	None	G4T2T3	S2S3	
Pseudobahia bahiifolia Hartweg's golden sunburst	PDAST7P010	Endangered	Endangered	G2	S2	1B.1
Pseudobahia peirsonii San Joaquin adobe sunburst	PDAST7P030	Threatened	Endangered	G1	S1	1B.1
Rana boylii foothill yellow-legged frog	AAABH01050	None	None	G3	S2S3	SSC
Sagittaria sanfordii Sanford's arrowhead	PMALI040Q0	None	None	G3	S3	1B.2
Sidalcea keckii Keck's checkerbloom	PDMAL110D0	Endangered	None	G1	S1	1B.1
Spea hammondii western spadefoot	AAABF02020	None	None	G3	S3	SSC
Sycamore Alluvial Woodland Sycamore Alluvial Woodland	CTT62100CA	None	None	G1	S1.1	
Talanites moodyae Moody's gnaphosid spider	ILARA98020	None	None	G1G2	S1S2	
Taxidea taxus American badger	AMAJF04010	None	None	G5	S4	SSC
Thamnophis gigas giant garter snake	ARADB36150	Threatened	Threatened	G2G3	S2S3	
Tropidocarpum capparideum caper-fruited tropidocarpum	PDBRA2R010	None	None	G1	S1	1B.1
Tuctoria greenei Greene's tuctoria	PMPOA6N010	Endangered	Rare	G1	S1	1B.1
Vulpes macrotis mutica San Joaquin kit fox	AMAJA03041	Endangered	Threatened	G4T2T3	S2S3	

Record Count: 62

Appendix D
California Native Plant Society (CNPS) Inventory of Rare Plants

ESA

CNPS Inventory of Rare and Endangered Plants

Status: Plant Press Manager window with 25 items - Thu, Oct. 24, 2013 17:04 ET c

- During each visit, we provide you with an empty "Plant Press" for collecting items of interest.
- Several report formats are available. Use the CSV and XML options to download raw data.

Reformat list as: Standard List - with Plant Press controls

DELETE unchecked items | check all | check none

open	save	scientific	common	family	CNPS
	☑	**Atriplex minuscula**	lesser saltscale	Chenopodiaceae	List 1B.1
	☑	**Carpenteria californica**	tree-anemone	Hydrangeaceae	List 1B.2
	☑	**Castilleja campestris var. succulenta**	succulent owl's-clover	Orobanchaceae	List 1B.2
	☑	**Caulanthus californicus**	California jewel-flower	Brassicaceae	List 1B.1
	☑	**Downingia pusilla**	dwarf downingia	Campanulaceae	List 2B.2
	☑	**Eriogonum nortonii**	Pinnacles buckwheat	Polygonaceae	List 1B.3
	☑	**Eriogonum nudum var. regirivum**	Kings River buckwheat	Polygonaceae	List 1B.2
	☑	**Eryngium spinosepalum**	spiny-sepaled button-celery	Apiaceae	List 1B.2
	☑	**Gratiola heterosepala**	Boggs Lake hedge-hyssop	Plantaginaceae	List 1B.2
	☑	**Imperata brevifolia**	California satintail	Poaceae	List 2B.1
	☑	**Lagophylla dichotoma**	forked hare-leaf	Asteraceae	List 1B.1
	☑	**Leptosiphon serrulatus**	Madera leptosiphon	Polemoniaceae	List 1B.2
	☑	**Lupinus citrinus var. citrinus**	orange lupine	Fabaceae	List 1B.2
	☑	**Mielichhoferia elongata**	elongate copper moss	Mniaceae	List 2B.2
	☑	**Mimulus acutidens**	Kings River monkeyflower	Phrymaceae	List 3
	☑	**Mimulus gracilipes**	slender-stalked monkeyflower	Phrymaceae	List 1B.2
	☑	**Orcuttia inaequalis**	San Joaquin Valley Orcutt grass	Poaceae	List 1B.1
	☑	**Orcuttia pilosa**	hairy Orcutt grass	Poaceae	List 1B.1
	☑	**Pseudobahia bahiifolia**	Hartweg's golden sunburst	Asteraceae	List 1B.1
	☑	**Pseudobahia peirsonii**	San Joaquin adobe sunburst	Asteraceae	List 1B.1
	☑	**Sagittaria sanfordii**	Sanford's arrowhead	Alismataceae	List 1B.2

	☑	**Schizymenium shevockii**	Shevock's copper moss	Bryaceae	List 1B.2
	☑	**Sidalcea keckii**	Keck's checkerbloom	Malvaceae	List 1B.1
	☑	**Tropidocarpum capparideum**	caper-fruited tropidocarpum	Brassicaceae	List 1B.1
	☑	**Tuctoria greenei**	Greene's tuctoria	Poaceae	List 1B.1

DELETE unchecked items | check all | check none

Appendix E
USFWS Federal Endangered and Threatened Species List

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825

October 24, 2013

Document Number: 131024030933

LeChi Huynh
Environmental Science Associates
2600 Capitol Avenue
Suite 200
Sacramento, CA 95816

Subject: Species List for City of Fresno Metro Plan Update Program EIR

Dear: Interested party

We are sending this official species list in response to your October 24, 2013 request for information about endangered and threatened species. The list covers the California counties and/or U.S. Geological Survey 7½ minute quad or quads you requested.

Our database was developed primarily to assist Federal agencies that are consulting with us. Therefore, our lists include all of the sensitive species that have been found in a certain area *and also ones that may be affected by projects in the area*. For example, a fish may be on the list for a quad if it lives somewhere downstream from that quad. Birds are included even if they only migrate through an area. In other words, we include all of the species we want people to consider when they do something that affects the environment.

Please read Important Information About Your Species List (below). It explains how we made the list and describes your responsibilities under the Endangered Species Act.

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed and candidate species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be January 22, 2014.

Please contact us if your project may affect endangered or threatened species or if you have any questions about the attached list or your responsibilities under the Endangered Species Act. A list of Endangered Species Program contacts can be found here.

Endangered Species Division

U.S. Fish & Wildlife Service

Sacramento Fish & Wildlife Office

Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in the Counties and/or U.S.G.S. 7 1/2 Minute Quads you requested

Document Number: 131024030933

Database Last Updated: September 18, 2011

Quad Lists

Listed Species

Invertebrates

Branchinecta conservatio
- Conservancy fairy shrimp (E)

Branchinecta lynchi
- Critical habitat, vernal pool fairy shrimp (X)
- vernal pool fairy shrimp (T)

Desmocerus californicus dimorphus
- valley elderberry longhorn beetle (T)

Fish

Hypomesus transpacificus
- delta smelt (T)

Oncorhynchus mykiss
- Central Valley steelhead (T) (NMFS)

Amphibians

Ambystoma californiense
- California tiger salamander, central population (T)
- Critical habitat, CA tiger salamander, central population (X)

Rana draytonii
- California red-legged frog (T)

Reptiles

Gambelia (=Crotaphytus) sila
- blunt-nosed leopard lizard (E)

Thamnophis gigas
- giant garter snake (T)

Mammals

Dipodomys nitratoides exilis
- Fresno kangaroo rat (E)

Vulpes macrotis mutica
- San Joaquin kit fox (E)

Plants

Castilleja campestris ssp. succulenta
- Critical habitat, succulent (=fleshy) owl's-clover (X)
- succulent (=fleshy) owl's-clover (T)

Caulanthus californicus

California jewelflower (E)

Orcuttia inaequalis

Critical habitat, San Joaquin Valley Orcutt grass (X)

San Joaquin Valley Orcutt grass (T)

Pseudobahia bahiifolia

Hartweg's golden sunburst (E)

Pseudobahia peirsonii

San Joaquin adobe sunburst (T)

Sidalcea keckii

Critical habitat, Keck's checker-mallow (X)

Keck's checker-mallow (=checkerbloom) (E)

Tuctoria greenei

Greene's tuctoria (=Orcutt grass) (E)

Quads Containing Listed, Proposed or Candidate Species:

WAHTOKE (356B)

SANGER (357A)

MALAGA (357B)

FRESNO SOUTH (358A)

PIEDRA (377C)

FRIANT (378B)

CLOVIS (378C)

ROUND MOUNTAIN (378D)

FRESNO NORTH (379D)

County Lists

No county species lists requested.

Key:

(E) *Endangered* - Listed as being in danger of extinction.

(T) *Threatened* - Listed as likely to become endangered within the foreseeable future.

(P) *Proposed* - Officially proposed in the Federal Register for listing as endangered or threatened.

(NMFS) Species under the Jurisdiction of the National Oceanic & Atmospheric Administration Fisheries Service. Consult with them directly about these species.

Critical Habitat - Area essential to the conservation of a species.

(PX) *Proposed Critical Habitat* - The species is already listed. Critical habitat is being proposed for it.

(C) *Candidate* - Candidate to become a proposed species.

(V) Vacated by a court order. Not currently in effect. Being reviewed by the Service.

(X) *Critical Habitat* designated for this species

Important Information About Your Species List

How We Make Species Lists

We store information about endangered and threatened species lists by U.S. Geological Survey 7½ minute quads. The United States is divided into these quads, which are about the size of San Francisco.

The animals on your species list are ones that occur within, **or may be affected by** projects within, the quads covered by the list.

- Fish and other aquatic species appear on your list if they are in the same watershed as your quad or if water use in your quad might affect them.
- Amphibians will be on the list for a quad or county if pesticides applied in that area may be carried to their habitat by air currents.
- Birds are shown regardless of whether they are resident or migratory. Relevant birds on the county list should be considered regardless of whether they appear on a quad list.

Plants

Any plants on your list are ones that have actually been observed in the area covered by the list. Plants may exist in an area without ever having been detected there. You can find out what's in the surrounding quads through the California Native Plant Society's online Inventory of Rare and Endangered Plants.

Surveying

Some of the species on your list may not be affected by your project. A trained biologist and/or botanist, familiar with the habitat requirements of the species on your list, should determine whether they or habitats suitable for them may be affected by your project. We recommend that your surveys include any proposed and candidate species on your list. See our Protocol and Recovery Permits pages.

For plant surveys, we recommend using the Guidelines for Conducting and Reporting Botanical Inventories. The results of your surveys should be published in any environmental documents prepared for your project.

Your Responsibilities Under the Endangered Species Act

All animals identified as listed above are fully protected under the Endangered Species Act of 1973, as amended. Section 9 of the Act and its implementing regulations prohibit the take of a federally listed wildlife species. Take is defined by the Act as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" any such animal.

> Take may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or shelter (50 CFR §17.3).

Take incidental to an otherwise lawful activity may be authorized by one of two procedures:

- If a Federal agency is involved with the permitting, funding, or carrying out of a project that may result in take, then that agency must engage in a formal consultation with the Service.

  During formal consultation, the Federal agency, the applicant and the Service work together to avoid or minimize the impact on listed species and their habitat. Such consultation would result in a biological opinion by the Service addressing the anticipated effect of the project on listed and proposed species. The opinion may authorize a limited level of incidental take.

- If no Federal agency is involved with the project, and federally listed species may be taken as part of the project, then you, the applicant, should apply for an incidental take permit. The Service may issue such a permit if you submit a satisfactory conservation plan for the species that would be affected by your project.

  Should your survey determine that federally listed or proposed species occur in the area and are likely to be affected by the project, we recommend that you work with this office and the California Department of Fish and Game to develop a plan that minimizes the project's direct and indirect impacts to listed species and compensates for project-related loss of habitat. You should include the plan in any environmental documents you file.

Critical Habitat

When a species is listed as endangered or threatened, areas of habitat considered essential to its conservation may be designated as critical habitat. These areas may require special management considerations or protection. They provide needed space for growth and normal behavior; food, water, air, light, other nutritional or physiological requirements; cover or shelter; and sites for breeding, reproduction, rearing of offspring, germination or seed dispersal.

Although critical habitat may be designated on private or State lands, activities on these lands are not restricted unless there is Federal involvement in the activities or direct harm to listed wildlife.

If any species has proposed or designated critical habitat within a quad, there will be a separate line for this on the species list. Boundary descriptions of the critical habitat may be found in the Federal Register. The information is also reprinted in the Code of Federal Regulations (50 CFR 17.95). See our Map Room page.

Candidate Species

We recommend that you address impacts to candidate species. We put plants and animals on our candidate list when we have enough scientific information to eventually propose them for listing as threatened or endangered. By considering these species early in your planning process you may be able to avoid the problems that could develop if one of these candidates was listed before the end of your project.

Species of Concern

The Sacramento Fish & Wildlife Office no longer maintains a list of species of concern. However, various other agencies and organizations maintain lists of at-risk species. These lists provide essential information for land management planning and conservation efforts. More info

Wetlands

If your project will impact wetlands, riparian habitat, or other jurisdictional waters as defined by section 404 of the Clean Water Act and/or section 10 of the Rivers and Harbors Act, you will need to obtain a permit from the U.S. Army Corps of Engineers. Impacts to wetland habitats require site specific mitigation and monitoring. For questions regarding wetlands, please contact Mark Littlefield of this office at (916) 414-6520.

Updates

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed and candidate species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be January 22, 2014.

Appendix F
Air Quality Data

Fresno WRMP - NE SWTF Improvements

Fresno County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Industrial Park	900.00	1000sqft	20.66	900,000.00	0

1.2 Other Project Characteristics

Urbanization Urban **Wind Speed (m/s)** 2.2 **Precipitation Freq (Days)** 45

Climate Zone 3 **Operational Year** 2014

Utility Company Pacific Gas & Electric Company

CO2 Intensity (lb/MWhr) 641.35 **CH4 Intensity (lb/MWhr)** 0.029 **N2O Intensity (lb/MWhr)** 0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Project applicant provided lot acreage of 20 acres.

Construction Phase - Construction schedule of 2018 - 2020, as provided by the project applicant. Limited Grading, and modification to existing facilities.

Grading - 20 acres grading, as provided by the project applicant.

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	20.00	22.00
tblConstructionPhase	NumDays	370.00	587.00
tblConstructionPhase	NumDays	35.00	20.00
tblConstructionPhase	NumDays	20.00	22.00
tblConstructionPhase	NumDays	10.00	24.00

tblGrading	AcresOfGrading	50.00	20.00
tblTripsAndVMT	HaulingTripNumber	0.00	4,063.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2018	0.7113	5.5187	6.7204	0.0132	0.7580	0.2493	1.0073	0.2809	0.2326	0.5135	0.0000	1,091.6317	1,091.6317	0.1104	0.0000	1,093.9496
2019	0.6095	4.2910	6.1330	0.0127	0.5200	0.1941	0.7141	0.1408	0.1820	0.3228	0.0000	1,007.5144	1,007.5144	0.0918	0.0000	1,009.4417
2020	6.5048	1.7671	2.6289	5.6600e-003	0.2252	0.0799	0.3050	0.0609	0.0748	0.1357	0.0000	440.3625	440.3625	0.0450	0.0000	441.3066
Total	**7.8256**	**11.5768**	**15.4823**	**0.0315**	**1.5032**	**0.5233**	**2.0265**	**0.4826**	**0.4895**	**0.9721**	**0.0000**	**2,539.5087**	**2,539.5087**	**0.2471**	**0.0000**	**2,544.6979**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2018	0.7113	5.5187	6.7204	0.0132	0.7580	0.2493	1.0073	0.2809	0.2326	0.5135	0.0000	1,091.6313	1,091.6313	0.1104	0.0000	1,093.9492
2019	0.6095	4.2910	6.1330	0.0127	0.5200	0.1941	0.7141	0.1408	0.1820	0.3228	0.0000	1,007.5141	1,007.5141	0.0918	0.0000	1,009.4414
2020	6.5048	1.7671	2.6289	5.6600e-003	0.2252	0.0799	0.3050	0.0609	0.0748	0.1357	0.0000	440.3623	440.3623	0.0450	0.0000	441.3064

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Total	**7.8256**	**11.5768**	**15.4823**	**0.0315**	**1.5032**	**0.5233**	**2.0265**	**0.4826**	**0.4895**	**0.9721**	**0.0000**	**2,539.5077**	**2,539.5077**	**0.2471**	**0.0000**	**2,544.6969**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	4.1416	8.0000e-005	8.6500e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.0161	0.0161	5.0000e-005	0.0000	0.0171
Energy	0.0666	0.6053	0.5085	3.6300e-003		0.0460	0.0460		0.0460	0.0460	0.0000	3,308.5579	3,308.5579	0.1324	0.0369	3,322.7683
Mobile	5.2522	17.3680	56.1316	0.0796	4.8497	0.2709	5.1206	1.3008	0.2487	1.5495	0.0000	6,752.7204	6,752.7204	0.2848	0.0000	6,758.7007
Waste						0.0000	0.0000		0.0000	0.0000	226.5379	0.0000	226.5379	13.3880	0.0000	507.6861
Water						0.0000	0.0000		0.0000	0.0000	66.0285	327.6141	393.6426	6.7966	0.1632	586.9616
Total	**9.4603**	**17.9734**	**56.6487**	**0.0832**	**4.8497**	**0.3169**	**5.1666**	**1.3008**	**0.2947**	**1.5955**	**292.5664**	**10,388.9085**	**10,681.4749**	**20.6019**	**0.2001**	**11,176.1338**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	4.1416	8.0000e-005	8.6500e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.0161	0.0161	5.0000e-005	0.0000	0.0171

Energy	0.0666	0.6053	0.5085	3.6300e-003		0.0460	0.0460		0.0460	0.0460	0.0000	3,308.5579	3,308.5579	0.1324	0.0369	3,322.7683
Mobile	5.2522	17.3680	56.1316	0.0796	4.8497	0.2709	5.1206	1.3008	0.2487	1.5495	0.0000	6,752.7204	6,752.7204	0.2848	0.0000	6,758.7007
Waste						0.0000	0.0000		0.0000	0.0000	226.5379	0.0000	226.5379	13.3880	0.0000	507.6861
Water						0.0000	0.0000		0.0000	0.0000	66.0285	327.6141	393.6426	6.7953	0.1629	586.8563
Total	**9.4603**	**17.9734**	**56.6487**	**0.0832**	**4.8497**	**0.3169**	**5.1666**	**1.3008**	**0.2947**	**1.5955**	**292.5664**	**10,388.9085**	**10,681.4749**	**20.6006**	**0.1998**	**11,176.0285**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	1/1/2018	2/1/2018	5	24	
2	Grading	Grading	2/2/2018	3/1/2018	5	20	
3	Building Construction	Building Construction	3/2/2018	6/1/2020	5	587	
4	Paving	Paving	6/2/2020	7/1/2020	5	22	
5	Architectural Coating	Architectural Coating	7/2/2020	7/31/2020	5	22	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 20

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 1,350,000; Non-Residential Outdoor: 450,000 (Architectural

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	255	0.40

Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	162	0.38
Grading	Graders	1	8.00	174	0.41
Grading	Rubber Tired Dozers	1	8.00	255	0.40
Grading	Scrapers	2	8.00	361	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	226	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	125	0.42
Paving	Paving Equipment	2	8.00	130	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	4,063.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	378.00	148.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	76.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2168	0.0000	0.2168	0.1192	0.0000	0.1192	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0515	0.5473	0.4348	4.7000e-004		0.0284	0.0284		0.0261	0.0261	0.0000	42.8892	42.8892	0.0134	0.0000	43.1696
Total	**0.0515**	**0.5473**	**0.4348**	**4.7000e-004**	**0.2168**	**0.0284**	**0.2452**	**0.1192**	**0.0261**	**0.1453**	**0.0000**	**42.8892**	**42.8892**	**0.0134**	**0.0000**	**43.1696**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.2000e-004	8.2000e-004	7.9100e-003	2.0000e-005	1.7300e-003	1.0000e-005	1.7400e-003	4.6000e-004	1.0000e-005	4.7000e-004	0.0000	1.3903	1.3903	7.0000e-005	0.0000	1.3917
Total	**6.2000e-004**	**8.2000e-004**	**7.9100e-003**	**2.0000e-005**	**1.7300e-003**	**1.0000e-005**	**1.7400e-003**	**4.6000e-004**	**1.0000e-005**	**4.7000e-004**	**0.0000**	**1.3903**	**1.3903**	**7.0000e-005**	**0.0000**	**1.3917**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Fugitive Dust					0.2168	0.0000	0.2168	0.1192	0.0000	0.1192	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0515	0.5473	0.4348	4.7000e-004		0.0284	0.0284		0.0261	0.0261	0.0000	42.8892	42.8892	0.0134	0.0000	43.1696
Total	**0.0515**	**0.5473**	**0.4348**	**4.7000e-004**	**0.2168**	**0.0284**	**0.2452**	**0.1192**	**0.0261**	**0.1453**	**0.0000**	**42.8892**	**42.8892**	**0.0134**	**0.0000**	**43.1696**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.2000e-004	8.2000e-004	7.9100e-003	2.0000e-005	1.7300e-003	1.0000e-005	1.7400e-003	4.6000e-004	1.0000e-005	4.7000e-004	0.0000	1.3903	1.3903	7.0000e-005	0.0000	1.3917
Total	**6.2000e-004**	**8.2000e-004**	**7.9100e-003**	**2.0000e-005**	**1.7300e-003**	**1.0000e-005**	**1.7400e-003**	**4.6000e-004**	**1.0000e-005**	**4.7000e-004**	**0.0000**	**1.3903**	**1.3903**	**7.0000e-005**	**0.0000**	**1.3917**

3.3 Grading - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0708	0.0000	0.0708	0.0343	0.0000	0.0343	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0529	0.5953	0.4231	6.2000e-004		0.0279	0.0279		0.0257	0.0257	0.0000	56.3616	56.3616	0.0176	0.0000	56.7301
Total	**0.0529**	**0.5953**	**0.4231**	**6.2000e-004**	**0.0708**	**0.0279**	**0.0987**	**0.0343**	**0.0257**	**0.0599**	**0.0000**	**56.3616**	**56.3616**	**0.0176**	**0.0000**	**56.7301**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0380	0.4238	0.4434	1.5100e-003	0.0348	7.1000e-003	0.0419	9.5600e-003	6.5300e-003	0.0161	0.0000	133.9978	133.9978	9.8000e-004	0.0000	134.0184
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.7000e-004	7.6000e-004	7.3200e-003	2.0000e-005	1.6000e-003	1.0000e-005	1.6100e-003	4.2000e-004	1.0000e-005	4.4000e-004	0.0000	1.2873	1.2873	6.0000e-005	0.0000	1.2886
Total	**0.0385**	**0.4245**	**0.4507**	**1.5300e-003**	**0.0364**	**7.1100e-003**	**0.0435**	**9.9800e-003**	**6.5400e-003**	**0.0165**	**0.0000**	**135.2851**	**135.2851**	**1.0400e-003**	**0.0000**	**135.3070**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0708	0.0000	0.0708	0.0343	0.0000	0.0343	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0529	0.5953	0.4231	6.2000e-004		0.0279	0.0279		0.0257	0.0257	0.0000	56.3615	56.3615	0.0176	0.0000	56.7300
Total	**0.0529**	**0.5953**	**0.4231**	**6.2000e-004**	**0.0708**	**0.0279**	**0.0987**	**0.0343**	**0.0257**	**0.0599**	**0.0000**	**56.3615**	**56.3615**	**0.0176**	**0.0000**	**56.7300**

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Hauling	0.0380	0.4238	0.4434	1.5100e-003	0.0348	7.1000e-003	0.0419	9.5600e-003	6.5300e-003	0.0161	0.0000	133.9978	133.9978	9.8000e-004	0.0000	134.0184
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.7000e-004	7.6000e-004	7.3200e-003	2.0000e-005	1.6000e-003	1.0000e-005	1.6100e-003	4.2000e-004	1.0000e-005	4.4000e-004	0.0000	1.2873	1.2873	6.0000e-005	0.0000	1.2886
Total	**0.0385**	**0.4245**	**0.4507**	**1.5300e-003**	**0.0364**	**7.1100e-003**	**0.0435**	**9.9800e-003**	**6.5400e-003**	**0.0165**	**0.0000**	**135.2851**	**135.2851**	**1.0400e-003**	**0.0000**	**135.3070**

3.4 Building Construction - 2018

Unmitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Off-Road	0.2896	2.5238	1.9023	2.9100e-003		0.1621	0.1621		0.1524	0.1524	0.0000	256.8951	256.8951	0.0629	0.0000	258.2153
Total	**0.2896**	**2.5238**	**1.9023**	**2.9100e-003**		**0.1621**	**0.1621**		**0.1524**	**0.1524**	**0.0000**	**256.8951**	**256.8951**	**0.0629**	**0.0000**	**258.2153**

Unmitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Vendor	0.1608	1.2717	2.0001	3.8000e-003	0.1044	0.0215	0.1260	0.0299	0.0198	0.0497	0.0000	334.8250	334.8250	2.7300e-003	0.0000	334.8824
Worker	0.1174	0.1552	1.5015	3.8300e-003	0.3279	2.2500e-003	0.3301	0.0872	2.0800e-003	0.0892	0.0000	263.9853	263.9853	0.0128	0.0000	264.2534
Total	**0.2782**	**1.4269**	**3.5016**	**7.6300e-003**	**0.4323**	**0.0238**	**0.4561**	**0.1171**	**0.0219**	**0.1389**	**0.0000**	**598.8103**	**598.8103**	**0.0155**	**0.0000**	**599.1358**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2896	2.5238	1.9023	2.9100e-003		0.1621	0.1621		0.1524	0.1524	0.0000	256.8948	256.8948	0.0629	0.0000	258.2150
Total	**0.2896**	**2.5238**	**1.9023**	**2.9100e-003**		**0.1621**	**0.1621**		**0.1524**	**0.1524**	**0.0000**	**256.8948**	**256.8948**	**0.0629**	**0.0000**	**258.2150**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1608	1.2717	2.0001	3.8000e-003	0.1044	0.0215	0.1260	0.0299	0.0198	0.0497	0.0000	334.8250	334.8250	2.7300e-003	0.0000	334.8824
Worker	0.1174	0.1552	1.5015	3.8300e-003	0.3279	2.2500e-003	0.3301	0.0872	2.0800e-003	0.0892	0.0000	263.9853	263.9853	0.0128	0.0000	264.2534
Total	**0.2782**	**1.4269**	**3.5016**	**7.6300e-003**	**0.4323**	**0.0238**	**0.4561**	**0.1171**	**0.0219**	**0.1389**	**0.0000**	**598.8103**	**598.8103**	**0.0155**	**0.0000**	**599.1358**

3.4 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.3069	2.7359	2.2342	3.5000e-003		0.1677	0.1677		0.1577	0.1577	0.0000	305.5302	305.5302	0.0743	0.0000	307.0913
Total	**0.3069**	**2.7359**	**2.2342**	**3.5000e-003**		**0.1677**	**0.1677**		**0.1577**	**0.1577**	**0.0000**	**305.5302**	**305.5302**	**0.0743**	**0.0000**	**307.0913**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1748	1.3855	2.2647	4.5600e-003	0.1256	0.0238	0.1494	0.0360	0.0219	0.0579	0.0000	395.7233	395.7233	3.1700e-003	0.0000	395.7899
Worker	0.1278	0.1696	1.6341	4.6100e-003	0.3944	2.6500e-003	0.3970	0.1048	2.4600e-003	0.1073	0.0000	306.2609	306.2609	0.0143	0.0000	306.5605
Total	**0.3026**	**1.5551**	**3.8988**	**9.1700e-003**	**0.5200**	**0.0264**	**0.5464**	**0.1408**	**0.0243**	**0.1651**	**0.0000**	**701.9842**	**701.9842**	**0.0174**	**0.0000**	**702.3504**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.3069	2.7359	2.2342	3.5000e-003		0.1677	0.1677		0.1577	0.1577	0.0000	305.5299	305.5299	0.0743	0.0000	307.0909
Total	**0.3069**	**2.7359**	**2.2342**	**3.5000e-003**		**0.1677**	**0.1677**		**0.1577**	**0.1577**	**0.0000**	**305.5299**	**305.5299**	**0.0743**	**0.0000**	**307.0909**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1748	1.3855	2.2647	4.5600e-003	0.1256	0.0238	0.1494	0.0360	0.0219	0.0579	0.0000	395.7233	395.7233	3.1700e-003	0.0000	395.7899
Worker	0.1278	0.1696	1.6341	4.6100e-003	0.3944	2.6500e-003	0.3970	0.1048	2.4600e-003	0.1073	0.0000	306.2609	306.2609	0.0143	0.0000	306.5605
Total	**0.3026**	**1.5551**	**3.8988**	**9.1700e-003**	**0.5200**	**0.0264**	**0.5464**	**0.1408**	**0.0243**	**0.1651**	**0.0000**	**701.9842**	**701.9842**	**0.0174**	**0.0000**	**702.3504**

3.4 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1151	1.0401	0.9161	1.4600e-003		0.0607	0.0607		0.0570	0.0570	0.0000	125.7042	125.7042	0.0306	0.0000	126.3473

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Total	**0.1151**	**1.0401**	**0.9161**	**1.4600e-003**		**0.0607**	**0.0607**		**0.0570**	**0.0570**	**0.0000**	**125.7042**	**125.7042**	**0.0306**	**0.0000**	**126.3473**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0635	0.4886	0.8765	1.9000e-003	0.0525	8.7100e-003	0.0612	0.0150	8.0100e-003	0.0230	0.0000	161.4493	161.4493	1.2600e-003	0.0000	161.4757
Worker	0.0494	0.0651	0.6278	1.9200e-003	0.1647	1.1000e-003	0.1658	0.0438	1.0200e-003	0.0448	0.0000	122.8681	122.8681	5.6100e-003	0.0000	122.9858
Total	**0.1128**	**0.5537**	**1.5043**	**3.8200e-003**	**0.2172**	**9.8100e-003**	**0.2270**	**0.0588**	**9.0300e-003**	**0.0678**	**0.0000**	**284.3173**	**284.3173**	**6.8700e-003**	**0.0000**	**284.4616**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1151	1.0401	0.9161	1.4600e-003		0.0607	0.0607		0.0570	0.0570	0.0000	125.7040	125.7040	0.0306	0.0000	126.3472
Total	**0.1151**	**1.0401**	**0.9161**	**1.4600e-003**		**0.0607**	**0.0607**		**0.0570**	**0.0570**	**0.0000**	**125.7040**	**125.7040**	**0.0306**	**0.0000**	**126.3472**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0635	0.4886	0.8765	1.9000e-003	0.0525	8.7100e-003	0.0612	0.0150	8.0100e-003	0.0230	0.0000	161.4493	161.4493	1.2600e-003	0.0000	161.4757
Worker	0.0494	0.0651	0.6278	1.9200e-003	0.1647	1.1000e-003	0.1658	0.0438	1.0200e-003	0.0448	0.0000	122.8681	122.8681	5.6100e-003	0.0000	122.9858
Total	**0.1128**	**0.5537**	**1.5043**	**3.8200e-003**	**0.2172**	**9.8100e-003**	**0.2270**	**0.0588**	**9.0300e-003**	**0.0678**	**0.0000**	**284.3173**	**284.3173**	**6.8700e-003**	**0.0000**	**284.4616**

3.5 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0146	0.1516	0.1579	2.5000e-004		8.1300e-003	8.1300e-003		7.4800e-003	7.4800e-003	0.0000	21.5623	21.5623	6.9700e-003	0.0000	21.7087
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0146**	**0.1516**	**0.1579**	**2.5000e-004**		**8.1300e-003**	**8.1300e-003**		**7.4800e-003**	**7.4800e-003**	**0.0000**	**21.5623**	**21.5623**	**6.9700e-003**	**0.0000**	**21.7087**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0000e-004	5.2000e-004	5.0300e-003	2.0000e-005	1.3200e-003	1.0000e-005	1.3300e-003	3.5000e-004	1.0000e-005	3.6000e-004	0.0000	0.9841	0.9841	4.0000e-005	0.0000	0.9850
Total	**4.0000e-004**	**5.2000e-004**	**5.0300e-003**	**2.0000e-005**	**1.3200e-003**	**1.0000e-005**	**1.3300e-003**	**3.5000e-004**	**1.0000e-005**	**3.6000e-004**	**0.0000**	**0.9841**	**0.9841**	**4.0000e-005**	**0.0000**	**0.9850**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0146	0.1516	0.1579	2.5000e-004		8.1300e-003	8.1300e-003		7.4800e-003	7.4800e-003	0.0000	21.5622	21.5622	6.9700e-003	0.0000	21.7087
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0146**	**0.1516**	**0.1579**	**2.5000e-004**		**8.1300e-003**	**8.1300e-003**		**7.4800e-003**	**7.4800e-003**	**0.0000**	**21.5622**	**21.5622**	**6.9700e-003**	**0.0000**	**21.7087**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Worker	4.0000e-004	5.2000e-004	5.0300e-003	2.0000e-005	1.3200e-003	1.0000e-005	1.3300e-003	3.5000e-004	1.0000e-005	3.6000e-004	0.0000	0.9841	0.9841	4.0000e-005	0.0000	0.9850
Total	**4.0000e-004**	**5.2000e-004**	**5.0300e-003**	**2.0000e-005**	**1.3200e-003**	**1.0000e-005**	**1.3300e-003**	**3.5000e-004**	**1.0000e-005**	**3.6000e-004**	**0.0000**	**0.9841**	**0.9841**	**4.0000e-005**	**0.0000**	**0.9850**

3.6 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	6.2573					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.6600e-003	0.0185	0.0202	3.0000e-005		1.2200e-003	1.2200e-003		1.2200e-003	1.2200e-003	0.0000	2.8086	2.8086	2.2000e-004	0.0000	2.8132
Total	**6.2599**	**0.0185**	**0.0202**	**3.0000e-005**		**1.2200e-003**	**1.2200e-003**		**1.2200e-003**	**1.2200e-003**	**0.0000**	**2.8086**	**2.8086**	**2.2000e-004**	**0.0000**	**2.8132**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0000e-003	2.6400e-003	0.0255	8.0000e-005	6.6800e-003	4.0000e-005	6.7300e-003	1.7800e-003	4.0000e-005	1.8200e-003	0.0000	4.9861	4.9861	2.3000e-004	0.0000	4.9908
Total	**2.0000e-003**	**2.6400e-003**	**0.0255**	**8.0000e-005**	**6.6800e-003**	**4.0000e-005**	**6.7300e-003**	**1.7800e-003**	**4.0000e-005**	**1.8200e-003**	**0.0000**	**4.9861**	**4.9861**	**2.3000e-004**	**0.0000**	**4.9908**

Mitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Archit. Coating	6.2573					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.6600e-003	0.0185	0.0202	3.0000e-005		1.2200e-003	1.2200e-003		1.2200e-003	1.2200e-003	0.0000	2.8086	2.8086	2.2000e-004	0.0000	2.8131
Total	**6.2599**	**0.0185**	**0.0202**	**3.0000e-005**		**1.2200e-003**	**1.2200e-003**		**1.2200e-003**	**1.2200e-003**	**0.0000**	**2.8086**	**2.8086**	**2.2000e-004**	**0.0000**	**2.8131**

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0000e-003	2.6400e-003	0.0255	8.0000e-005	6.6800e-003	4.0000e-005	6.7300e-003	1.7800e-003	4.0000e-005	1.8200e-003	0.0000	4.9861	4.9861	2.3000e-004	0.0000	4.9908
Total	**2.0000e-003**	**2.6400e-003**	**0.0255**	**8.0000e-005**	**6.6800e-003**	**4.0000e-005**	**6.7300e-003**	**1.7800e-003**	**4.0000e-005**	**1.8200e-003**	**0.0000**	**4.9861**	**4.9861**	**2.3000e-004**	**0.0000**	**4.9908**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Mitigated	5.2522	17.3680	56.1316	0.0796	4.8497	0.2709	5.1206	1.3008	0.2487	1.5495	0.0000	6,752.7204	6,752.7204	0.2848	0.0000	6,758.7007
Unmitigated	5.2522	17.3680	56.1316	0.0796	4.8497	0.2709	5.1206	1.3008	0.2487	1.5495	0.0000	6,752.7204	6,752.7204	0.2848	0.0000	6,758.7007

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Industrial Park	6,264.00	2,241.00	657.00	12,816,246	12,816,246
Total	6,264.00	2,241.00	657.00	12,816,246	12,816,246

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Industrial Park	9.50	7.30	7.30	59.00	28.00	13.00	79	19	2

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.442140	0.064191	0.163446	0.173530	0.044009	0.007253	0.017375	0.074976	0.002071	0.001797	0.006530	0.000807	0.001875

5.0 Energy Detail

4.4 Fleet Mix

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	2,649.6216	2,649.6216	0.1198	0.0248	2,659.8219
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	2,649.6216	2,649.6216	0.1198	0.0248	2,659.8219
NaturalGas Mitigated	0.0666	0.6053	0.5085	3.6300e-003		0.0460	0.0460		0.0460	0.0460	0.0000	658.9363	658.9363	0.0126	0.0121	662.9465
NaturalGas Unmitigated	0.0666	0.6053	0.5085	3.6300e-003		0.0460	0.0460		0.0460	0.0460	0.0000	658.9363	658.9363	0.0126	0.0121	662.9465

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Industrial Park	1.2348e+007	0.0666	0.6053	0.5085	3.6300e-003		0.0460	0.0460		0.0460	0.0460	0.0000	658.9363	658.9363	0.0126	0.0121	662.9465
Total		**0.0666**	**0.6053**	**0.5085**	**3.6300e-003**		**0.0460**	**0.0460**		**0.0460**	**0.0460**	**0.0000**	**658.9363**	**658.9363**	**0.0126**	**0.0121**	**662.9465**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Land Use	kBTU/yr	tons/yr										MT/yr					
Industrial Park	1.2348e+007	0.0666	0.6053	0.5085	3.6300e-003		0.0460	0.0460		0.0460	0.0460	0.0000	658.9363	658.9363	0.0126	0.0121	662.9465
Total		**0.0666**	**0.6053**	**0.5085**	**3.6300e-003**		**0.0460**	**0.0460**		**0.0460**	**0.0460**	**0.0000**	**658.9363**	**658.9363**	**0.0126**	**0.0121**	**662.9465**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Industrial Park	9.108e+006	2,649.6216	0.1198	0.0248	2,659.8219
Total		**2,649.6216**	**0.1198**	**0.0248**	**2,659.8219**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Industrial Park	9.108e+006	2,649.6216	0.1198	0.0248	2,659.8219
Total		**2,649.6216**	**0.1198**	**0.0248**	**2,659.8219**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	4.1416	8.0000e-005	8.6500e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.0161	0.0161	5.0000e-005	0.0000	0.0171
Unmitigated	4.1416	8.0000e-005	8.6500e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.0161	0.0161	5.0000e-005	0.0000	0.0171

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.6257					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	3.5150					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	8.7000e-004	8.0000e-005	8.6500e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.0161	0.0161	5.0000e-005	0.0000	0.0171
Total	**4.1416**	**8.0000e-005**	**8.6500e-003**	**0.0000**		**3.0000e-005**	**3.0000e-005**		**3.0000e-005**	**3.0000e-005**	**0.0000**	**0.0161**	**0.0161**	**5.0000e-005**	**0.0000**	**0.0171**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.6257					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	3.5150					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	8.7000e-004	8.0000e-005	8.6500e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.0161	0.0161	5.0000e-005	0.0000	0.0171
Total	**4.1416**	**8.0000e-005**	**8.6500e-003**	**0.0000**		**3.0000e-005**	**3.0000e-005**		**3.0000e-005**	**3.0000e-005**	**0.0000**	**0.0161**	**0.0161**	**5.0000e-005**	**0.0000**	**0.0171**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	393.6426	6.7953	0.1629	586.8563
Unmitigated	393.6426	6.7966	0.1632	586.9616

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e

Land Use	Mgal	MT/yr			
Industrial Park	208.125 / 0	393.6426	6.7966	0.1632	586.9616
Total		**393.6426**	**6.7966**	**0.1632**	**586.9616**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Industrial Park	208.125 / 0	393.6426	6.7953	0.1629	586.8563
Total		**393.6426**	**6.7953**	**0.1629**	**586.8563**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	226.5379	13.3880	0.0000	507.6861

Unmitigated	226.5379	13.3880	0.0000	507.6861

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Industrial Park	1116	226.5379	13.3880	0.0000	507.6861
Total		**226.5379**	**13.3880**	**0.0000**	**507.6861**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Industrial Park	1116	226.5379	13.3880	0.0000	507.6861
Total		**226.5379**	**13.3880**	**0.0000**	**507.6861**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Vegetation

Fresno WRMP - SE SWTF - Conveyance Option 1

Fresno County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Industrial Park	2,530.00	1000sqft	58.08	2,530,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	45
Climate Zone	3			**Operational Year**	2019
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Project applicant provided lot acreage of 58 acres.

Construction Phase - Construction schedule of 2015 - 2018, as provided by the project applicant. Phase ranges split up based on default % breakdown.

Grading -

Table Name	Column Name	Default Value	New Value
tblGrading	MaterialExported	0.00	265,000.00
tblProjectCharacteristics	OperationalYear	2014	2019

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2014	1.4903	15.4459	13.3069	0.0229	1.3822	0.5502	1.9324	0.5430	0.5083	1.0513	0.0000	2,113.3892	2,113.3892	0.1912	0.0000	2,117.4045
2015	1.8566	10.8974	18.4108	0.0294	1.4612	0.3973	1.8585	0.3956	0.3710	0.7666	0.0000	2,500.7566	2,500.7566	0.1485	0.0000	2,503.8752
2016	1.6573	9.7957	16.8163	0.0293	1.4612	0.3594	1.8205	0.3956	0.3355	0.7311	0.0000	2,447.5882	2,447.5882	0.1404	0.0000	2,450.5361
2017	1.4789	8.7748	15.4306	0.0292	1.4557	0.3183	1.7740	0.3941	0.2973	0.6914	0.0000	2,377.3147	2,377.3147	0.1328	0.0000	2,380.1026
2018	1.2875	7.8495	14.1122	0.0293	1.4613	0.2752	1.7365	0.3956	0.2571	0.6528	0.0000	2,331.1196	2,331.1196	0.1280	0.0000	2,333.8078
2019	17.7906	1.3654	2.2039	4.6600e-003	0.2139	0.0597	0.2737	0.0576	0.0557	0.1133	0.0000	364.5752	364.5752	0.0394	0.0000	365.4015
Total	**25.5612**	**54.1286**	**80.2807**	**0.1447**	**7.4353**	**1.9602**	**9.3956**	**2.1815**	**1.8249**	**4.0064**	**0.0000**	**12,134.7435**	**12,134.7435**	**0.7802**	**0.0000**	**12,151.1276**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2014	1.4903	15.4459	13.3069	0.0229	1.3822	0.5502	1.9324	0.5430	0.5083	1.0513	0.0000	2,113.3885	2,113.3885	0.1912	0.0000	2,117.4038
2015	1.8566	10.8974	18.4108	0.0294	1.4612	0.3973	1.8585	0.3956	0.3710	0.7666	0.0000	2,500.7562	2,500.7562	0.1485	0.0000	2,503.8748
2016	1.6573	9.7957	16.8163	0.0293	1.4612	0.3594	1.8205	0.3956	0.3355	0.7311	0.0000	2,447.5878	2,447.5878	0.1404	0.0000	2,450.5357
2017	1.4789	8.7748	15.4306	0.0292	1.4557	0.3183	1.7740	0.3941	0.2973	0.6914	0.0000	2,377.3143	2,377.3143	0.1328	0.0000	2,380.1022

2018	1.2875	7.8494	14.1122	0.0293	1.4613	0.2752	1.7365	0.3956	0.2571	0.6528	0.0000	2,331.1192	2,331.1192	0.1280	0.0000	2,333.8074
2019	17.7906	1.3654	2.2039	4.6600e-003	0.2139	0.0597	0.2737	0.0576	0.0557	0.1133	0.0000	364.5751	364.5751	0.0394	0.0000	365.4014
Total	**25.5612**	**54.1286**	**80.2806**	**0.1447**	**7.4353**	**1.9602**	**9.3956**	**2.1815**	**1.8249**	**4.0064**	**0.0000**	**12,134.7412**	**12,134.7412**	**0.7802**	**0.0000**	**12,151.1253**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	11.6421	2.2000e-004	0.0235	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005	0.0000	0.0452	0.0452	1.2000e-004	0.0000	0.0478
Energy	0.1872	1.7016	1.4293	0.0102		0.1293	0.1293		0.1293	0.1293	0.0000	9,300.7240	9,300.7240	0.3723	0.1036	9,340.6710
Mobile	9.1968	29.4989	103.3432	0.2271	13.6518	0.4398	14.0916	3.6634	0.4049	4.0683	0.0000	16,982.6605	16,982.6605	0.5284	0.0000	16,993.7577
Waste						0.0000	0.0000		0.0000	0.0000	636.8233	0.0000	636.8233	37.6352	0.0000	1,427.1619
Water						0.0000	0.0000		0.0000	0.0000	185.6133	920.9597	1,106.5731	19.1059	0.4588	1,650.0143
Total	**21.0261**	**31.2007**	**104.7960**	**0.2373**	**13.6518**	**0.5692**	**14.2210**	**3.6634**	**0.5343**	**4.1977**	**822.4366**	**27,204.3894**	**28,026.8260**	**57.6420**	**0.5624**	**29,411.6527**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Area	11.6421	2.2000e-004	0.0235	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005	0.0000	0.0452	0.0452	1.2000e-004	0.0000	0.0478
Energy	0.1872	1.7016	1.4293	0.0102		0.1293	0.1293		0.1293	0.1293	0.0000	9,300.7240	9,300.7240	0.3723	0.1036	9,340.6710
Mobile	9.1968	29.4989	103.3432	0.2271	13.6518	0.4398	14.0916	3.6634	0.4049	4.0683	0.0000	16,982.6605	16,982.6605	0.5284	0.0000	16,993.7577
Waste						0.0000	0.0000		0.0000	0.0000	636.8233	0.0000	636.8233	37.6352	0.0000	1,427.1619
Water						0.0000	0.0000		0.0000	0.0000	185.6133	920.9597	1,106.5731	19.1024	0.4580	1,649.7181
Total	**21.0261**	**31.2007**	**104.7960**	**0.2373**	**13.6518**	**0.5692**	**14.2210**	**3.6634**	**0.5343**	**4.1977**	**822.4366**	**27,204.3894**	**28,026.8260**	**57.6385**	**0.5617**	**29,411.3566**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.01**	**0.13**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2014	4/8/2014	5	70	
2	Site Preparation	Site Preparation	4/9/2014	6/3/2014	5	40	
3	Grading	Grading	6/4/2014	11/4/2014	5	110	
4	Building Construction	Building Construction	11/5/2014	2/5/2019	5	1110	
5	Paving	Paving	2/6/2019	5/21/2019	5	75	
6	Architectural Coating	Architectural Coating	5/22/2019	9/3/2019	5	75	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 275

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 3,795,000; Non-Residential Outdoor: 1,265,000 (Architectural

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	162	0.38
Demolition	Rubber Tired Dozers	2	8.00	255	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	255	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	162	0.38
Grading	Graders	1	8.00	174	0.41
Grading	Rubber Tired Dozers	1	8.00	255	0.40
Grading	Scrapers	2	8.00	361	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	226	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	125	0.42
Paving	Paving Equipment	2	8.00	130	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	33,125.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

Building Construction	9	1,063.00	415.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	213.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2014

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1609	1.7340	1.2701	1.4000e-003		0.0885	0.0885		0.0826	0.0826	0.0000	132.2158	132.2158	0.0357	0.0000	132.9661
Total	**0.1609**	**1.7340**	**1.2701**	**1.4000e-003**		**0.0885**	**0.0885**		**0.0826**	**0.0826**	**0.0000**	**132.2158**	**132.2158**	**0.0357**	**0.0000**	**132.9661**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.4900e-003	3.2000e-003	0.0316	5.0000e-005	4.2000e-003	4.0000e-005	4.2300e-003	1.1200e-003	3.0000e-005	1.1500e-003	0.0000	3.9127	3.9127	2.4000e-004	0.0000	3.9178

Total	2.4900e-003	3.2000e-003	0.0316	5.0000e-005	4.2000e-003	4.0000e-005	4.2300e-003	1.1200e-003	3.0000e-005	1.1500e-003	0.0000	3.9127	3.9127	2.4000e-004	0.0000	3.9178

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1609	1.7340	1.2701	1.4000e-003		0.0885	0.0885		0.0826	0.0826	0.0000	132.2157	132.2157	0.0357	0.0000	132.9660
Total	**0.1609**	**1.7340**	**1.2701**	**1.4000e-003**		**0.0885**	**0.0885**		**0.0826**	**0.0826**	**0.0000**	**132.2157**	**132.2157**	**0.0357**	**0.0000**	**132.9660**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.4900e-003	3.2000e-003	0.0316	5.0000e-005	4.2000e-003	4.0000e-005	4.2300e-003	1.1200e-003	3.0000e-005	1.1500e-003	0.0000	3.9127	3.9127	2.4000e-004	0.0000	3.9178
Total	**2.4900e-003**	**3.2000e-003**	**0.0316**	**5.0000e-005**	**4.2000e-003**	**4.0000e-005**	**4.2300e-003**	**1.1200e-003**	**3.0000e-005**	**1.1500e-003**	**0.0000**	**3.9127**	**3.9127**	**2.4000e-004**	**0.0000**	**3.9178**

3.3 Site Preparation - 2014

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.3613	0.0000	0.3613	0.1986	0.0000	0.1986	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1058	1.1524	0.8592	7.8000e-004		0.0628	0.0628		0.0577	0.0577	0.0000	75.4032	75.4032	0.0223	0.0000	75.8712
Total	**0.1058**	**1.1524**	**0.8592**	**7.8000e-004**	**0.3613**	**0.0628**	**0.4241**	**0.1986**	**0.0577**	**0.2563**	**0.0000**	**75.4032**	**75.4032**	**0.0223**	**0.0000**	**75.8712**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.7100e-003	2.1900e-003	0.0217	3.0000e-005	2.8800e-003	2.0000e-005	2.9000e-003	7.6000e-004	2.0000e-005	7.9000e-004	0.0000	2.6830	2.6830	1.7000e-004	0.0000	2.6865
Total	**1.7100e-003**	**2.1900e-003**	**0.0217**	**3.0000e-005**	**2.8800e-003**	**2.0000e-005**	**2.9000e-003**	**7.6000e-004**	**2.0000e-005**	**7.9000e-004**	**0.0000**	**2.6830**	**2.6830**	**1.7000e-004**	**0.0000**	**2.6865**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Fugitive Dust					0.3613	0.0000	0.3613	0.1986	0.0000	0.1986	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1058	1.1524	0.8592	7.8000e-004		0.0628	0.0628		0.0577	0.0577	0.0000	75.4031	75.4031	0.0223	0.0000	75.8711
Total	**0.1058**	**1.1524**	**0.8592**	**7.8000e-004**	**0.3613**	**0.0628**	**0.4241**	**0.1986**	**0.0577**	**0.2563**	**0.0000**	**75.4031**	**75.4031**	**0.0223**	**0.0000**	**75.8711**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.7100e-003	2.1900e-003	0.0217	3.0000e-005	2.8800e-003	2.0000e-005	2.9000e-003	7.6000e-004	2.0000e-005	7.9000e-004	0.0000	2.6830	2.6830	1.7000e-004	0.0000	2.6865
Total	**1.7100e-003**	**2.1900e-003**	**0.0217**	**3.0000e-005**	**2.8800e-003**	**2.0000e-005**	**2.9000e-003**	**7.6000e-004**	**2.0000e-005**	**7.9000e-004**	**0.0000**	**2.6830**	**2.6830**	**1.7000e-004**	**0.0000**	**2.6865**

3.4 Grading - 2014

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4920	0.0000	0.4920	0.2001	0.0000	0.2001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.3766	4.4397	2.8371	3.4000e-003		0.2134	0.2134		0.1963	0.1963	0.0000	327.0545	327.0545	0.0967	0.0000	329.0841
Total	**0.3766**	**4.4397**	**2.8371**	**3.4000e-003**	**0.4920**	**0.2134**	**0.7054**	**0.2001**	**0.1963**	**0.3964**	**0.0000**	**327.0545**	**327.0545**	**0.0967**	**0.0000**	**329.0841**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.5029	6.1880	4.9859	0.0125	0.2834	0.1147	0.3981	0.0779	0.1055	0.1834	0.0000	1,162.6827	1,162.6827	0.0107	0.0000	1,162.9081
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.2300e-003	6.6900e-003	0.0663	1.0000e-004	8.7900e-003	7.0000e-005	8.8700e-003	2.3400e-003	7.0000e-005	2.4000e-003	0.0000	8.1980	8.1980	5.1000e-004	0.0000	8.2087
Total	**0.5082**	**6.1947**	**5.0522**	**0.0126**	**0.2922**	**0.1148**	**0.4070**	**0.0803**	**0.1056**	**0.1858**	**0.0000**	**1,170.8808**	**1,170.8808**	**0.0112**	**0.0000**	**1,171.1167**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4920	0.0000	0.4920	0.2001	0.0000	0.2001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.3766	4.4397	2.8371	3.4000e-003		0.2134	0.2134		0.1963	0.1963	0.0000	327.0541	327.0541	0.0967	0.0000	329.0837
Total	**0.3766**	**4.4397**	**2.8371**	**3.4000e-003**	**0.4920**	**0.2134**	**0.7054**	**0.2001**	**0.1963**	**0.3964**	**0.0000**	**327.0541**	**327.0541**	**0.0967**	**0.0000**	**329.0837**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.5029	6.1880	4.9859	0.0125	0.2834	0.1147	0.3981	0.0779	0.1055	0.1834	0.0000	1,162.6827	1,162.6827	0.0107	0.0000	1,162.9081
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.2300e-003	6.6900e-003	0.0663	1.0000e-004	8.7900e-003	7.0000e-005	8.8700e-003	2.3400e-003	7.0000e-005	2.4000e-003	0.0000	8.1980	8.1980	5.1000e-004	0.0000	8.2087
Total	**0.5082**	**6.1947**	**5.0522**	**0.0126**	**0.2922**	**0.1148**	**0.4070**	**0.0803**	**0.1056**	**0.1858**	**0.0000**	**1,170.8808**	**1,170.8808**	**0.0112**	**0.0000**	**1,171.1167**

3.5 Building Construction - 2014

<u>Unmitigated Construction On-Site</u>

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0793	0.6407	0.3881	5.5000e-004		0.0457	0.0457		0.0430	0.0430	0.0000	50.3837	50.3837	0.0128	0.0000	50.6527
Total	**0.0793**	**0.6407**	**0.3881**	**5.5000e-004**		**0.0457**	**0.0457**		**0.0430**	**0.0430**	**0.0000**	**50.3837**	**50.3837**	**0.0128**	**0.0000**	**50.6527**

<u>Unmitigated Construction Off-Site</u>

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Vendor	0.1518	1.1464	1.5337	2.0400e-003	0.0553	0.0237	0.0790	0.0158	0.0218	0.0376	0.0000	188.4486	188.4486	2.0800e-003	0.0000	188.4923
Worker	0.1035	0.1326	1.3133	2.0300e-003	0.1742	1.4700e-003	0.1757	0.0463	1.3300e-003	0.0476	0.0000	162.4069	162.4069	0.0100	0.0000	162.6171
Total	**0.2553**	**1.2790**	**2.8470**	**4.0700e-003**	**0.2295**	**0.0252**	**0.2547**	**0.0622**	**0.0231**	**0.0852**	**0.0000**	**350.8555**	**350.8555**	**0.0121**	**0.0000**	**351.1094**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0793	0.6407	0.3881	5.5000e-004		0.0457	0.0457		0.0430	0.0430	0.0000	50.3837	50.3837	0.0128	0.0000	50.6527
Total	**0.0793**	**0.6407**	**0.3881**	**5.5000e-004**		**0.0457**	**0.0457**		**0.0430**	**0.0430**	**0.0000**	**50.3837**	**50.3837**	**0.0128**	**0.0000**	**50.6527**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1518	1.1464	1.5337	2.0400e-003	0.0553	0.0237	0.0790	0.0158	0.0218	0.0376	0.0000	188.4486	188.4486	2.0800e-003	0.0000	188.4923
Worker	0.1035	0.1326	1.3133	2.0300e-003	0.1742	1.4700e-003	0.1757	0.0463	1.3300e-003	0.0476	0.0000	162.4069	162.4069	0.0100	0.0000	162.6171
Total	**0.2553**	**1.2790**	**2.8470**	**4.0700e-003**	**0.2295**	**0.0252**	**0.2547**	**0.0622**	**0.0231**	**0.0852**	**0.0000**	**350.8555**	**350.8555**	**0.0121**	**0.0000**	**351.1094**

3.5 Building Construction - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.4775	3.9189	2.4462	3.5000e-003		0.2762	0.2762		0.2598	0.2598	0.0000	318.4126	318.4126	0.0799	0.0000	320.0903
Total	**0.4775**	**3.9189**	**2.4462**	**3.5000e-003**		**0.2762**	**0.2762**		**0.2598**	**0.2598**	**0.0000**	**318.4126**	**318.4126**	**0.0799**	**0.0000**	**320.0903**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.7973	6.2331	8.6041	0.0129	0.3521	0.1125	0.4646	0.1008	0.1034	0.2042	0.0000	1,183.4803	1,183.4803	0.0113	0.0000	1,183.7176
Worker	0.5817	0.7455	7.3605	0.0130	1.1090	8.6400e-003	1.1177	0.2948	7.8800e-003	0.3027	0.0000	998.8637	998.8637	0.0573	0.0000	1,000.0673
Total	**1.3790**	**6.9785**	**15.9646**	**0.0259**	**1.4612**	**0.1211**	**1.5823**	**0.3956**	**0.1112**	**0.5068**	**0.0000**	**2,182.3440**	**2,182.3440**	**0.0686**	**0.0000**	**2,183.7849**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.4775	3.9189	2.4462	3.5000e-003		0.2762	0.2762		0.2598	0.2598	0.0000	318.4122	318.4122	0.0799	0.0000	320.0899
Total	**0.4775**	**3.9189**	**2.4462**	**3.5000e-003**		**0.2762**	**0.2762**		**0.2598**	**0.2598**	**0.0000**	**318.4122**	**318.4122**	**0.0799**	**0.0000**	**320.0899**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.7973	6.2331	8.6041	0.0129	0.3521	0.1125	0.4646	0.1008	0.1034	0.2042	0.0000	1,183.4803	1,183.4803	0.0113	0.0000	1,183.7176
Worker	0.5817	0.7455	7.3605	0.0130	1.1090	8.6400e-003	1.1177	0.2948	7.8800e-003	0.3027	0.0000	998.8637	998.8637	0.0573	0.0000	1,000.0673
Total	**1.3790**	**6.9785**	**15.9646**	**0.0259**	**1.4612**	**0.1211**	**1.5823**	**0.3956**	**0.1112**	**0.5068**	**0.0000**	**2,182.3440**	**2,182.3440**	**0.0686**	**0.0000**	**2,183.7849**

3.5 Building Construction - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.4445	3.7201	2.4151	3.5000e-003		0.2567	0.2567		0.2412	0.2412	0.0000	316.0104	316.0104	0.0784	0.0000	317.6563

Total	**0.4445**	**3.7201**	**2.4151**	**3.5000e-003**		**0.2567**	**0.2567**		**0.2412**	**0.2412**	**0.0000**	**316.0104**	**316.0104**	**0.0784**	**0.0000**	**317.6563**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.6994	5.4149	7.9066	0.0129	0.3522	0.0945	0.4466	0.1008	0.0868	0.1877	0.0000	1,169.2510	1,169.2510	0.0102	0.0000	1,169.4658
Worker	0.5134	0.6607	6.4946	0.0129	1.1090	8.1500e-003	1.1172	0.2948	7.4600e-003	0.3022	0.0000	962.3268	962.3268	0.0518	0.0000	963.4139
Total	**1.2128**	**6.0756**	**14.4012**	**0.0258**	**1.4612**	**0.1026**	**1.5638**	**0.3956**	**0.0943**	**0.4899**	**0.0000**	**2,131.5778**	**2,131.5778**	**0.0620**	**0.0000**	**2,132.8798**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.4445	3.7201	2.4151	3.5000e-003		0.2567	0.2567		0.2412	0.2412	0.0000	316.0101	316.0101	0.0784	0.0000	317.6560
Total	**0.4445**	**3.7201**	**2.4151**	**3.5000e-003**		**0.2567**	**0.2567**		**0.2412**	**0.2412**	**0.0000**	**316.0101**	**316.0101**	**0.0784**	**0.0000**	**317.6560**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.6994	5.4149	7.9066	0.0129	0.3522	0.0945	0.4466	0.1008	0.0868	0.1877	0.0000	1,169.2510	1,169.2510	0.0102	0.0000	1,169.4658
Worker	0.5134	0.6607	6.4946	0.0129	1.1090	8.1500e-003	1.1172	0.2948	7.4600e-003	0.3022	0.0000	962.3268	962.3268	0.0518	0.0000	963.4139
Total	**1.2128**	**6.0756**	**14.4012**	**0.0258**	**1.4612**	**0.1026**	**1.5638**	**0.3956**	**0.0943**	**0.4899**	**0.0000**	**2,131.5778**	**2,131.5778**	**0.0620**	**0.0000**	**2,132.8798**

3.5 Building Construction - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.4033	3.4327	2.3568	3.4900e-003		0.2316	0.2316		0.2175	0.2175	0.0000	311.3228	311.3228	0.0766	0.0000	312.9319
Total	**0.4033**	**3.4327**	**2.3568**	**3.4900e-003**		**0.2316**	**0.2316**		**0.2175**	**0.2175**	**0.0000**	**311.3228**	**311.3228**	**0.0766**	**0.0000**	**312.9319**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.6285	4.7589	7.3922	0.0128	0.3509	0.0790	0.4299	0.1005	0.0726	0.1731	0.0000	1,145.1427	1,145.1427	9.4500e-003	0.0000	1,145.3410
Worker	0.4471	0.5831	5.6816	0.0129	1.1048	7.7500e-003	1.1125	0.2936	7.1300e-003	0.3008	0.0000	920.8491	920.8491	0.0467	0.0000	921.8296
Total	**1.0756**	**5.3420**	**13.0738**	**0.0257**	**1.4557**	**0.0868**	**1.5425**	**0.3941**	**0.0798**	**0.4739**	**0.0000**	**2,065.9918**	**2,065.9918**	**0.0561**	**0.0000**	**2,067.1707**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.4033	3.4327	2.3568	3.4900e-003		0.2316	0.2316		0.2175	0.2175	0.0000	311.3225	311.3225	0.0766	0.0000	312.9315
Total	**0.4033**	**3.4327**	**2.3568**	**3.4900e-003**		**0.2316**	**0.2316**		**0.2175**	**0.2175**	**0.0000**	**311.3225**	**311.3225**	**0.0766**	**0.0000**	**312.9315**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.6285	4.7589	7.3922	0.0128	0.3509	0.0790	0.4299	0.1005	0.0726	0.1731	0.0000	1,145.1427	1,145.1427	9.4500e-003	0.0000	1,145.3410

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Worker	0.4471	0.5831	5.6816	0.0129	1.1048	7.7500e-003	1.1125	0.2936	7.1300e-003	0.3008	0.0000	920.8491	920.8491	0.0467	0.0000	921.8296
Total	**1.0756**	**5.3420**	**13.0738**	**0.0257**	**1.4557**	**0.0868**	**1.5425**	**0.3941**	**0.0798**	**0.4739**	**0.0000**	**2,065.9918**	**2,065.9918**	**0.0561**	**0.0000**	**2,067.1707**

3.5 Building Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.3483	3.0355	2.2880	3.5000e-003		0.1950	0.1950		0.1833	0.1833	0.0000	308.9844	308.9844	0.0756	0.0000	310.5723
Total	**0.3483**	**3.0355**	**2.2880**	**3.5000e-003**		**0.1950**	**0.1950**		**0.1833**	**0.1833**	**0.0000**	**308.9844**	**308.9844**	**0.0756**	**0.0000**	**310.5723**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.5423	4.2890	6.7455	0.0128	0.3522	0.0726	0.4249	0.1009	0.0668	0.1677	0.0000	1,129.2369	1,129.2369	9.2200e-003	0.0000	1,129.4305
Worker	0.3970	0.5249	5.0786	0.0130	1.1090	7.5900e-003	1.1166	0.2948	7.0200e-003	0.3018	0.0000	892.8982	892.8982	0.0432	0.0000	893.8050
Total	**0.9392**	**4.8139**	**11.8241**	**0.0258**	**1.4613**	**0.0802**	**1.5415**	**0.3956**	**0.0738**	**0.4694**	**0.0000**	**2,022.1352**	**2,022.1352**	**0.0524**	**0.0000**	**2,023.2355**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.3483	3.0355	2.2880	3.5000e-003		0.1950	0.1950		0.1833	0.1833	0.0000	308.9841	308.9841	0.0756	0.0000	310.5720
Total	**0.3483**	**3.0355**	**2.2880**	**3.5000e-003**		**0.1950**	**0.1950**		**0.1833**	**0.1833**	**0.0000**	**308.9841**	**308.9841**	**0.0756**	**0.0000**	**310.5720**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.5423	4.2890	6.7455	0.0128	0.3522	0.0726	0.4249	0.1009	0.0668	0.1677	0.0000	1,129.2369	1,129.2369	9.2200e-003	0.0000	1,129.4305
Worker	0.3970	0.5249	5.0786	0.0130	1.1090	7.5900e-003	1.1166	0.2948	7.0200e-003	0.3018	0.0000	892.8982	892.8982	0.0432	0.0000	893.8050
Total	**0.9392**	**4.8139**	**11.8241**	**0.0258**	**1.4613**	**0.0802**	**1.5415**	**0.3956**	**0.0738**	**0.4694**	**0.0000**	**2,022.1352**	**2,022.1352**	**0.0524**	**0.0000**	**2,023.2355**

3.5 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Off-Road	0.0306	0.2726	0.2226	3.5000e-004		0.0167	0.0167		0.0157	0.0157	0.0000	30.4360	30.4360	7.4100e-003	0.0000	30.5915
Total	**0.0306**	**0.2726**	**0.2226**	**3.5000e-004**		**0.0167**	**0.0167**		**0.0157**	**0.0157**	**0.0000**	**30.4360**	**30.4360**	**7.4100e-003**	**0.0000**	**30.5915**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0488	0.3870	0.6326	1.2800e-003	0.0351	6.6500e-003	0.0417	0.0101	6.1100e-003	0.0162	0.0000	110.5378	110.5378	8.9000e-004	0.0000	110.5564
Worker	0.0358	0.0475	0.4578	1.2900e-003	0.1105	7.4000e-004	0.1112	0.0294	6.9000e-004	0.0301	0.0000	85.7958	85.7958	4.0000e-003	0.0000	85.8797
Total	**0.0846**	**0.4345**	**1.0904**	**2.5700e-003**	**0.1456**	**7.3900e-003**	**0.1530**	**0.0394**	**6.8000e-003**	**0.0462**	**0.0000**	**196.3336**	**196.3336**	**4.8900e-003**	**0.0000**	**196.4361**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0306	0.2726	0.2226	3.5000e-004		0.0167	0.0167		0.0157	0.0157	0.0000	30.4359	30.4359	7.4100e-003	0.0000	30.5914
Total	**0.0306**	**0.2726**	**0.2226**	**3.5000e-004**		**0.0167**	**0.0167**		**0.0157**	**0.0157**	**0.0000**	**30.4359**	**30.4359**	**7.4100e-003**	**0.0000**	**30.5914**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0488	0.3870	0.6326	1.2800e-003	0.0351	6.6500e-003	0.0417	0.0101	6.1100e-003	0.0162	0.0000	110.5378	110.5378	8.9000e-004	0.0000	110.5564
Worker	0.0358	0.0475	0.4578	1.2900e-003	0.1105	7.4000e-004	0.1112	0.0294	6.9000e-004	0.0301	0.0000	85.7958	85.7958	4.0000e-003	0.0000	85.8797
Total	**0.0846**	**0.4345**	**1.0904**	**2.5700e-003**	**0.1456**	**7.3900e-003**	**0.1530**	**0.0394**	**6.8000e-003**	**0.0462**	**0.0000**	**196.3336**	**196.3336**	**4.8900e-003**	**0.0000**	**196.4361**

3.6 Paving - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0535	0.5601	0.5387	8.4000e-004		0.0304	0.0304		0.0279	0.0279	0.0000	75.1480	75.1480	0.0238	0.0000	75.6473
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0535**	**0.5601**	**0.5387**	**8.4000e-004**		**0.0304**	**0.0304**		**0.0279**	**0.0279**	**0.0000**	**75.1480**	**75.1480**	**0.0238**	**0.0000**	**75.6473**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4600e-003	1.9300e-003	0.0186	5.0000e-005	4.5000e-003	3.0000e-005	4.5300e-003	1.2000e-003	3.0000e-005	1.2200e-003	0.0000	3.4923	3.4923	1.6000e-004	0.0000	3.4957
Total	**1.4600e-003**	**1.9300e-003**	**0.0186**	**5.0000e-005**	**4.5000e-003**	**3.0000e-005**	**4.5300e-003**	**1.2000e-003**	**3.0000e-005**	**1.2200e-003**	**0.0000**	**3.4923**	**3.4923**	**1.6000e-004**	**0.0000**	**3.4957**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0535	0.5601	0.5387	8.4000e-004		0.0304	0.0304		0.0279	0.0279	0.0000	75.1479	75.1479	0.0238	0.0000	75.6472
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0535**	**0.5601**	**0.5387**	**8.4000e-004**		**0.0304**	**0.0304**		**0.0279**	**0.0279**	**0.0000**	**75.1479**	**75.1479**	**0.0238**	**0.0000**	**75.6472**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4600e-003	1.9300e-003	0.0186	5.0000e-005	4.5000e-003	3.0000e-005	4.5300e-003	1.2000e-003	3.0000e-005	1.2200e-003	0.0000	3.4923	3.4923	1.6000e-004	0.0000	3.4957
Total	**1.4600e-003**	**1.9300e-003**	**0.0186**	**5.0000e-005**	**4.5000e-003**	**3.0000e-005**	**4.5300e-003**	**1.2000e-003**	**3.0000e-005**	**1.2200e-003**	**0.0000**	**3.4923**	**3.4923**	**1.6000e-004**	**0.0000**	**3.4957**

3.7 Architectural Coating - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	17.5898					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.9900e-003	0.0688	0.0691	1.1000e-004		4.8300e-003	4.8300e-003		4.8300e-003	4.8300e-003	0.0000	9.5747	9.5747	8.1000e-004	0.0000	9.5917
Total	**17.5998**	**0.0688**	**0.0691**	**1.1000e-004**		**4.8300e-003**	**4.8300e-003**		**4.8300e-003**	**4.8300e-003**	**0.0000**	**9.5747**	**9.5747**	**8.1000e-004**	**0.0000**	**9.5917**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0207	0.0275	0.2646	7.5000e-004	0.0639	4.3000e-004	0.0643	0.0170	4.0000e-004	0.0174	0.0000	49.5907	49.5907	2.3100e-003	0.0000	49.6392

Total	**0.0207**	**0.0275**	**0.2646**	**7.5000e-004**	**0.0639**	**4.3000e-004**	**0.0643**	**0.0170**	**4.0000e-004**	**0.0174**	**0.0000**	**49.5907**	**49.5907**	**2.3100e-003**	**0.0000**	**49.6392**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	17.5898					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.9900e-003	0.0688	0.0691	1.1000e-004		4.8300e-003	4.8300e-003		4.8300e-003	4.8300e-003	0.0000	9.5747	9.5747	8.1000e-004	0.0000	9.5917
Total	**17.5998**	**0.0688**	**0.0691**	**1.1000e-004**		**4.8300e-003**	**4.8300e-003**		**4.8300e-003**	**4.8300e-003**	**0.0000**	**9.5747**	**9.5747**	**8.1000e-004**	**0.0000**	**9.5917**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0207	0.0275	0.2646	7.5000e-004	0.0639	4.3000e-004	0.0643	0.0170	4.0000e-004	0.0174	0.0000	49.5907	49.5907	2.3100e-003	0.0000	49.6392
Total	**0.0207**	**0.0275**	**0.2646**	**7.5000e-004**	**0.0639**	**4.3000e-004**	**0.0643**	**0.0170**	**4.0000e-004**	**0.0174**	**0.0000**	**49.5907**	**49.5907**	**2.3100e-003**	**0.0000**	**49.6392**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	9.1968	29.4989	103.3432	0.2271	13.6518	0.4398	14.0916	3.6634	0.4049	4.0683	0.0000	16,982.6605	16,982.6605	0.5284	0.0000	16,993.7577
Unmitigated	9.1968	29.4989	103.3432	0.2271	13.6518	0.4398	14.0916	3.6634	0.4049	4.0683	0.0000	16,982.6605	16,982.6605	0.5284	0.0000	16,993.7577

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Industrial Park	17,608.80	6,299.70	1846.90	36,027,891	36,027,891
Total	17,608.80	6,299.70	1,846.90	36,027,891	36,027,891

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Industrial Park	9.50	7.30	7.30	59.00	28.00	13.00	79	19	2

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.438302	0.063917	0.163234	0.169914	0.042886	0.007084	0.019490	0.082149	0.002063	0.001756	0.006579	0.000764	0.001861

5.0 Energy Detail

4.4 Fleet Mix

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	7,448.3808	7,448.3808	0.3368	0.0697	7,477.0548
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	7,448.3808	7,448.3808	0.3368	0.0697	7,477.0548
NaturalGas Mitigated	0.1872	1.7016	1.4293	0.0102		0.1293	0.1293		0.1293	0.1293	0.0000	1,852.3432	1,852.3432	0.0355	0.0340	1,863.6162
NaturalGas Unmitigated	0.1872	1.7016	1.4293	0.0102		0.1293	0.1293		0.1293	0.1293	0.0000	1,852.3432	1,852.3432	0.0355	0.0340	1,863.6162

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Industrial Park	3.47116e+007	0.1872	1.7016	1.4293	0.0102		0.1293	0.1293		0.1293	0.1293	0.0000	1,852.3432	1,852.3432	0.0355	0.0340	1,863.6162
Total		**0.1872**	**1.7016**	**1.4293**	**0.0102**		**0.1293**	**0.1293**		**0.1293**	**0.1293**	**0.0000**	**1,852.3432**	**1,852.3432**	**0.0355**	**0.0340**	**1,863.6162**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Land Use	kBTU/yr	tons/yr										MT/yr					
Industrial Park	3.47116e+007	0.1872	1.7016	1.4293	0.0102		0.1293	0.1293		0.1293	0.1293	0.0000	1,852.3432	1,852.3432	0.0355	0.0340	1,863.6162
Total		**0.1872**	**1.7016**	**1.4293**	**0.0102**		**0.1293**	**0.1293**		**0.1293**	**0.1293**	**0.0000**	**1,852.3432**	**1,852.3432**	**0.0355**	**0.0340**	**1,863.6162**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Industrial Park	2.56036e+007	7,448.3808	0.3368	0.0697	7,477.0548
Total		**7,448.3808**	**0.3368**	**0.0697**	**7,477.0548**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Industrial Park	2.56036e+007	7,448.3808	0.3368	0.0697	7,477.0548
Total		**7,448.3808**	**0.3368**	**0.0697**	**7,477.0548**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	11.6421	2.2000e-004	0.0235	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005	0.0000	0.0452	0.0452	1.2000e-004	0.0000	0.0478
Unmitigated	11.6421	2.2000e-004	0.0235	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005	0.0000	0.0452	0.0452	1.2000e-004	0.0000	0.0478

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	1.7590					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	9.8809					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.2200e-003	2.2000e-004	0.0235	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005	0.0000	0.0452	0.0452	1.2000e-004	0.0000	0.0478
Total	**11.6421**	**2.2000e-004**	**0.0235**	**0.0000**		**8.0000e-005**	**8.0000e-005**		**8.0000e-005**	**8.0000e-005**	**0.0000**	**0.0452**	**0.0452**	**1.2000e-004**	**0.0000**	**0.0478**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	1.7590					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	9.8809					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.2200e-003	2.2000e-004	0.0235	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005	0.0000	0.0452	0.0452	1.2000e-004	0.0000	0.0478
Total	**11.6421**	**2.2000e-004**	**0.0235**	**0.0000**		**8.0000e-005**	**8.0000e-005**		**8.0000e-005**	**8.0000e-005**	**0.0000**	**0.0452**	**0.0452**	**1.2000e-004**	**0.0000**	**0.0478**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	1,106.5731	19.1024	0.4580	1,649.7181
Unmitigated	1,106.5731	19.1059	0.4588	1,650.0143

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e

Land Use	Mgal	MT/yr			
Industrial Park	585.063 / 0	1,106.5731	19.1059	0.4588	1,650.0143
Total		**1,106.5731**	**19.1059**	**0.4588**	**1,650.0143**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Industrial Park	585.063 / 0	1,106.5731	19.1024	0.4580	1,649.7181
Total		**1,106.5731**	**19.1024**	**0.4580**	**1,649.7181**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	636.8233	37.6352	0.0000	1,427.1619

Unmitigated	636.8233	37.6352	0.0000	1,427.1619

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Industrial Park	3137.2	636.8233	37.6352	0.0000	1,427.1619
Total		**636.8233**	**37.6352**	**0.0000**	**1,427.1619**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Industrial Park	3137.2	636.8233	37.6352	0.0000	1,427.1619
Total		**636.8233**	**37.6352**	**0.0000**	**1,427.1619**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Vegetation

Fresno WRMP - SE SWTF - Conveyance Option 2

Fresno County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Industrial Park	2,530.00	1000sqft	58.08	2,530,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	45
Climate Zone	3			**Operational Year**	2019
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Project applicant provided lot acreage of 58 acres.

Construction Phase - Construction schedule of 2015 - 2018, as provided by the project applicant. Phase ranges split up based on default % breakdown.

Grading -

Table Name	Column Name	Default Value	New Value
tblGrading	MaterialExported	0.00	32,500.00
tblProjectCharacteristics	OperationalYear	2014	2019

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2014	1.0491	10.0169	8.9326	0.0119	1.1204	0.4496	1.5699	0.4726	0.4158	0.8884	0.0000	1,093.3172	1,093.3172	0.1818	0.0000	1,097.1348
2015	1.8566	10.8974	18.4108	0.0294	1.4612	0.3973	1.8585	0.3956	0.3710	0.7666	0.0000	2,500.7566	2,500.7566	0.1485	0.0000	2,503.8752
2016	1.6573	9.7957	16.8163	0.0293	1.4612	0.3594	1.8205	0.3956	0.3355	0.7311	0.0000	2,447.5882	2,447.5882	0.1404	0.0000	2,450.5361
2017	1.4789	8.7748	15.4306	0.0292	1.4557	0.3183	1.7740	0.3941	0.2973	0.6914	0.0000	2,377.3147	2,377.3147	0.1328	0.0000	2,380.1026
2018	1.2875	7.8495	14.1122	0.0293	1.4613	0.2752	1.7365	0.3956	0.2571	0.6528	0.0000	2,331.1196	2,331.1196	0.1280	0.0000	2,333.8078
2019	17.7906	1.3654	2.2039	4.6600e-003	0.2139	0.0597	0.2737	0.0576	0.0557	0.1133	0.0000	364.5752	364.5752	0.0394	0.0000	365.4015
Total	**25.1200**	**48.6996**	**75.9063**	**0.1337**	**7.1736**	**1.8596**	**9.0331**	**2.1111**	**1.7323**	**3.8434**	**0.0000**	**11,114.6715**	**11,114.6715**	**0.7708**	**0.0000**	**11,130.8579**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2014	1.0491	10.0169	8.9326	0.0119	1.1204	0.4496	1.5699	0.4726	0.4157	0.8884	0.0000	1,093.3165	1,093.3165	0.1818	0.0000	1,097.1341
2015	1.8566	10.8974	18.4108	0.0294	1.4612	0.3973	1.8585	0.3956	0.3710	0.7666	0.0000	2,500.7562	2,500.7562	0.1485	0.0000	2,503.8748
2016	1.6573	9.7957	16.8163	0.0293	1.4612	0.3594	1.8205	0.3956	0.3355	0.7311	0.0000	2,447.5878	2,447.5878	0.1404	0.0000	2,450.5357
2017	1.4789	8.7748	15.4306	0.0292	1.4557	0.3183	1.7740	0.3941	0.2973	0.6914	0.0000	2,377.3143	2,377.3143	0.1328	0.0000	2,380.1022

2018	1.2875	7.8494	14.1122	0.0293	1.4613	0.2752	1.7365	0.3956	0.2571	0.6528	0.0000	2,331.1192	2,331.1192	0.1280	0.0000	2,333.8074
2019	17.7906	1.3654	2.2039	4.6600e-003	0.2139	0.0597	0.2737	0.0576	0.0557	0.1133	0.0000	364.5751	364.5751	0.0394	0.0000	365.4014
Total	**25.1200**	**48.6995**	**75.9063**	**0.1337**	**7.1736**	**1.8596**	**9.0331**	**2.1111**	**1.7323**	**3.8434**	**0.0000**	**11,114.6691**	**11,114.6691**	**0.7708**	**0.0000**	**11,130.8556**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	11.6421	2.2000e-004	0.0235	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005	0.0000	0.0452	0.0452	1.2000e-004	0.0000	0.0478
Energy	0.1872	1.7016	1.4293	0.0102		0.1293	0.1293		0.1293	0.1293	0.0000	9,300.7240	9,300.7240	0.3723	0.1036	9,340.6710
Mobile	9.1968	29.4989	103.3432	0.2271	13.6518	0.4398	14.0916	3.6634	0.4049	4.0683	0.0000	16,982.6605	16,982.6605	0.5284	0.0000	16,993.7577
Waste						0.0000	0.0000		0.0000	0.0000	636.8233	0.0000	636.8233	37.6352	0.0000	1,427.1619
Water						0.0000	0.0000		0.0000	0.0000	185.6133	920.9597	1,106.5731	19.1059	0.4588	1,650.0143
Total	**21.0261**	**31.2007**	**104.7960**	**0.2373**	**13.6518**	**0.5692**	**14.2210**	**3.6634**	**0.5343**	**4.1977**	**822.4366**	**27,204.3894**	**28,026.8260**	**57.6420**	**0.5624**	**29,411.6527**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Area	11.6421	2.2000e-004	0.0235	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005	0.0000	0.0452	0.0452	1.2000e-004	0.0000	0.0478
Energy	0.1872	1.7016	1.4293	0.0102		0.1293	0.1293		0.1293	0.1293	0.0000	9,300.7240	9,300.7240	0.3723	0.1036	9,340.6710
Mobile	9.1968	29.4989	103.3432	0.2271	13.6518	0.4398	14.0916	3.6634	0.4049	4.0683	0.0000	16,982.6605	16,982.6605	0.5284	0.0000	16,993.7577
Waste						0.0000	0.0000		0.0000	0.0000	636.8233	0.0000	636.8233	37.6352	0.0000	1,427.1619
Water						0.0000	0.0000		0.0000	0.0000	185.6133	920.9597	1,106.5731	19.1024	0.4580	1,649.7181
Total	**21.0261**	**31.2007**	**104.7960**	**0.2373**	**13.6518**	**0.5692**	**14.2210**	**3.6634**	**0.5343**	**4.1977**	**822.4366**	**27,204.3894**	**28,026.8260**	**57.6385**	**0.5617**	**29,411.3566**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2014	4/8/2014	5	70	
2	Site Preparation	Site Preparation	4/9/2014	6/3/2014	5	40	
3	Grading	Grading	6/4/2014	11/4/2014	5	110	
4	Building Construction	Building Construction	11/5/2014	2/5/2019	5	1110	
5	Paving	Paving	2/6/2019	5/21/2019	5	75	
6	Architectural Coating	Architectural Coating	5/22/2019	9/3/2019	5	75	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 275

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 3,795,000; Non-Residential Outdoor: 1,265,000 (Architectural

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	162	0.38
Demolition	Rubber Tired Dozers	2	8.00	255	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	255	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	162	0.38
Grading	Graders	1	8.00	174	0.41
Grading	Rubber Tired Dozers	1	8.00	255	0.40
Grading	Scrapers	2	8.00	361	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	226	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	125	0.42
Paving	Paving Equipment	2	8.00	130	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	4,063.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

Building Construction		9	1,063.00	415.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving		6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating		1	213.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2014

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1609	1.7340	1.2701	1.4000e-003		0.0885	0.0885		0.0826	0.0826	0.0000	132.2158	132.2158	0.0357	0.0000	132.9661
Total	**0.1609**	**1.7340**	**1.2701**	**1.4000e-003**		**0.0885**	**0.0885**		**0.0826**	**0.0826**	**0.0000**	**132.2158**	**132.2158**	**0.0357**	**0.0000**	**132.9661**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.4900e-003	3.2000e-003	0.0316	5.0000e-005	4.2000e-003	4.0000e-005	4.2300e-003	1.1200e-003	3.0000e-005	1.1500e-003	0.0000	3.9127	3.9127	2.4000e-004	0.0000	3.9178

Total	2.4900e-003	3.2000e-003	0.0316	5.0000e-005	4.2000e-003	4.0000e-005	4.2300e-003	1.1200e-003	3.0000e-005	1.1500e-003	0.0000	3.9127	3.9127	2.4000e-004	0.0000	3.9178

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1609	1.7340	1.2701	1.4000e-003		0.0885	0.0885		0.0826	0.0826	0.0000	132.2157	132.2157	0.0357	0.0000	132.9660
Total	**0.1609**	**1.7340**	**1.2701**	**1.4000e-003**		**0.0885**	**0.0885**		**0.0826**	**0.0826**	**0.0000**	**132.2157**	**132.2157**	**0.0357**	**0.0000**	**132.9660**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.4900e-003	3.2000e-003	0.0316	5.0000e-005	4.2000e-003	4.0000e-005	4.2300e-003	1.1200e-003	3.0000e-005	1.1500e-003	0.0000	3.9127	3.9127	2.4000e-004	0.0000	3.9178
Total	**2.4900e-003**	**3.2000e-003**	**0.0316**	**5.0000e-005**	**4.2000e-003**	**4.0000e-005**	**4.2300e-003**	**1.1200e-003**	**3.0000e-005**	**1.1500e-003**	**0.0000**	**3.9127**	**3.9127**	**2.4000e-004**	**0.0000**	**3.9178**

3.3 Site Preparation - 2014

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.3613	0.0000	0.3613	0.1986	0.0000	0.1986	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1058	1.1524	0.8592	7.8000e-004		0.0628	0.0628		0.0577	0.0577	0.0000	75.4032	75.4032	0.0223	0.0000	75.8712
Total	**0.1058**	**1.1524**	**0.8592**	**7.8000e-004**	**0.3613**	**0.0628**	**0.4241**	**0.1986**	**0.0577**	**0.2563**	**0.0000**	**75.4032**	**75.4032**	**0.0223**	**0.0000**	**75.8712**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.7100e-003	2.1900e-003	0.0217	3.0000e-005	2.8800e-003	2.0000e-005	2.9000e-003	7.6000e-004	2.0000e-005	7.9000e-004	0.0000	2.6830	2.6830	1.7000e-004	0.0000	2.6865
Total	**1.7100e-003**	**2.1900e-003**	**0.0217**	**3.0000e-005**	**2.8800e-003**	**2.0000e-005**	**2.9000e-003**	**7.6000e-004**	**2.0000e-005**	**7.9000e-004**	**0.0000**	**2.6830**	**2.6830**	**1.7000e-004**	**0.0000**	**2.6865**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Fugitive Dust					0.3613	0.0000	0.3613	0.1986	0.0000	0.1986	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1058	1.1524	0.8592	7.8000e-004		0.0628	0.0628		0.0577	0.0577	0.0000	75.4031	75.4031	0.0223	0.0000	75.8711
Total	**0.1058**	**1.1524**	**0.8592**	**7.8000e-004**	**0.3613**	**0.0628**	**0.4241**	**0.1986**	**0.0577**	**0.2563**	**0.0000**	**75.4031**	**75.4031**	**0.0223**	**0.0000**	**75.8711**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.7100e-003	2.1900e-003	0.0217	3.0000e-005	2.8800e-003	2.0000e-005	2.9000e-003	7.6000e-004	2.0000e-005	7.9000e-004	0.0000	2.6830	2.6830	1.7000e-004	0.0000	2.6865
Total	**1.7100e-003**	**2.1900e-003**	**0.0217**	**3.0000e-005**	**2.8800e-003**	**2.0000e-005**	**2.9000e-003**	**7.6000e-004**	**2.0000e-005**	**7.9000e-004**	**0.0000**	**2.6830**	**2.6830**	**1.7000e-004**	**0.0000**	**2.6865**

3.4 Grading - 2014

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4789	0.0000	0.4789	0.1981	0.0000	0.1981	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.3766	4.4397	2.8371	3.4000e-003		0.2134	0.2134		0.1963	0.1963	0.0000	327.0545	327.0545	0.0967	0.0000	329.0841
Total	**0.3766**	**4.4397**	**2.8371**	**3.4000e-003**	**0.4789**	**0.2134**	**0.6922**	**0.1981**	**0.1963**	**0.3944**	**0.0000**	**327.0545**	**327.0545**	**0.0967**	**0.0000**	**329.0841**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0617	0.7590	0.6116	1.5300e-003	0.0348	0.0141	0.0488	9.5600e-003	0.0129	0.0225	0.0000	142.6107	142.6107	1.3200e-003	0.0000	142.6384
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.2300e-003	6.6900e-003	0.0663	1.0000e-004	8.7900e-003	7.0000e-005	8.8700e-003	2.3400e-003	7.0000e-005	2.4000e-003	0.0000	8.1980	8.1980	5.1000e-004	0.0000	8.2087
Total	**0.0669**	**0.7657**	**0.6778**	**1.6300e-003**	**0.0436**	**0.0141**	**0.0577**	**0.0119**	**0.0130**	**0.0249**	**0.0000**	**150.8088**	**150.8088**	**1.8300e-003**	**0.0000**	**150.8470**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4789	0.0000	0.4789	0.1981	0.0000	0.1981	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.3766	4.4397	2.8371	3.4000e-003		0.2134	0.2134		0.1963	0.1963	0.0000	327.0541	327.0541	0.0967	0.0000	329.0837
Total	**0.3766**	**4.4397**	**2.8371**	**3.4000e-003**	**0.4789**	**0.2134**	**0.6922**	**0.1981**	**0.1963**	**0.3944**	**0.0000**	**327.0541**	**327.0541**	**0.0967**	**0.0000**	**329.0837**

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Hauling	0.0617	0.7590	0.6116	1.5300e-003	0.0348	0.0141	0.0488	9.5600e-003	0.0129	0.0225	0.0000	142.6107	142.6107	1.3200e-003	0.0000	142.6384
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.2300e-003	6.6900e-003	0.0663	1.0000e-004	8.7900e-003	7.0000e-005	8.8700e-003	2.3400e-003	7.0000e-005	2.4000e-003	0.0000	8.1980	8.1980	5.1000e-004	0.0000	8.2087
Total	**0.0669**	**0.7657**	**0.6778**	**1.6300e-003**	**0.0436**	**0.0141**	**0.0577**	**0.0119**	**0.0130**	**0.0249**	**0.0000**	**150.8088**	**150.8088**	**1.8300e-003**	**0.0000**	**150.8470**

3.5 Building Construction - 2014

Unmitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Off-Road	0.0793	0.6407	0.3881	5.5000e-004		0.0457	0.0457		0.0430	0.0430	0.0000	50.3837	50.3837	0.0128	0.0000	50.6527
Total	**0.0793**	**0.6407**	**0.3881**	**5.5000e-004**		**0.0457**	**0.0457**		**0.0430**	**0.0430**	**0.0000**	**50.3837**	**50.3837**	**0.0128**	**0.0000**	**50.6527**

Unmitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Vendor	0.1518	1.1464	1.5337	2.0400e-003	0.0553	0.0237	0.0790	0.0158	0.0218	0.0376	0.0000	188.4486	188.4486	2.0800e-003	0.0000	188.4923
Worker	0.1035	0.1326	1.3133	2.0300e-003	0.1742	1.4700e-003	0.1757	0.0463	1.3300e-003	0.0476	0.0000	162.4069	162.4069	0.0100	0.0000	162.6171
Total	**0.2553**	**1.2790**	**2.8470**	**4.0700e-003**	**0.2295**	**0.0252**	**0.2547**	**0.0622**	**0.0231**	**0.0852**	**0.0000**	**350.8555**	**350.8555**	**0.0121**	**0.0000**	**351.1094**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0793	0.6407	0.3881	5.5000e-004		0.0457	0.0457		0.0430	0.0430	0.0000	50.3837	50.3837	0.0128	0.0000	50.6527
Total	**0.0793**	**0.6407**	**0.3881**	**5.5000e-004**		**0.0457**	**0.0457**		**0.0430**	**0.0430**	**0.0000**	**50.3837**	**50.3837**	**0.0128**	**0.0000**	**50.6527**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1518	1.1464	1.5337	2.0400e-003	0.0553	0.0237	0.0790	0.0158	0.0218	0.0376	0.0000	188.4486	188.4486	2.0800e-003	0.0000	188.4923
Worker	0.1035	0.1326	1.3133	2.0300e-003	0.1742	1.4700e-003	0.1757	0.0463	1.3300e-003	0.0476	0.0000	162.4069	162.4069	0.0100	0.0000	162.6171
Total	**0.2553**	**1.2790**	**2.8470**	**4.0700e-003**	**0.2295**	**0.0252**	**0.2547**	**0.0622**	**0.0231**	**0.0852**	**0.0000**	**350.8555**	**350.8555**	**0.0121**	**0.0000**	**351.1094**

3.5 Building Construction - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.4775	3.9189	2.4462	3.5000e-003		0.2762	0.2762		0.2598	0.2598	0.0000	318.4126	318.4126	0.0799	0.0000	320.0903
Total	**0.4775**	**3.9189**	**2.4462**	**3.5000e-003**		**0.2762**	**0.2762**		**0.2598**	**0.2598**	**0.0000**	**318.4126**	**318.4126**	**0.0799**	**0.0000**	**320.0903**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.7973	6.2331	8.6041	0.0129	0.3521	0.1125	0.4646	0.1008	0.1034	0.2042	0.0000	1,183.4803	1,183.4803	0.0113	0.0000	1,183.7176
Worker	0.5817	0.7455	7.3605	0.0130	1.1090	8.6400e-003	1.1177	0.2948	7.8800e-003	0.3027	0.0000	998.8637	998.8637	0.0573	0.0000	1,000.0673
Total	**1.3790**	**6.9785**	**15.9646**	**0.0259**	**1.4612**	**0.1211**	**1.5823**	**0.3956**	**0.1112**	**0.5068**	**0.0000**	**2,182.3440**	**2,182.3440**	**0.0686**	**0.0000**	**2,183.7849**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.4775	3.9189	2.4462	3.5000e-003		0.2762	0.2762		0.2598	0.2598	0.0000	318.4122	318.4122	0.0799	0.0000	320.0899
Total	**0.4775**	**3.9189**	**2.4462**	**3.5000e-003**		**0.2762**	**0.2762**		**0.2598**	**0.2598**	**0.0000**	**318.4122**	**318.4122**	**0.0799**	**0.0000**	**320.0899**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.7973	6.2331	8.6041	0.0129	0.3521	0.1125	0.4646	0.1008	0.1034	0.2042	0.0000	1,183.4803	1,183.4803	0.0113	0.0000	1,183.7176
Worker	0.5817	0.7455	7.3605	0.0130	1.1090	8.6400e-003	1.1177	0.2948	7.8800e-003	0.3027	0.0000	998.8637	998.8637	0.0573	0.0000	1,000.0673
Total	**1.3790**	**6.9785**	**15.9646**	**0.0259**	**1.4612**	**0.1211**	**1.5823**	**0.3956**	**0.1112**	**0.5068**	**0.0000**	**2,182.3440**	**2,182.3440**	**0.0686**	**0.0000**	**2,183.7849**

3.5 Building Construction - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.4445	3.7201	2.4151	3.5000e-003		0.2567	0.2567		0.2412	0.2412	0.0000	316.0104	316.0104	0.0784	0.0000	317.6563

Total	**0.4445**	**3.7201**	**2.4151**	**3.5000e-003**		**0.2567**	**0.2567**		**0.2412**	**0.2412**	**0.0000**	**316.0104**	**316.0104**	**0.0784**	**0.0000**	**317.6563**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.6994	5.4149	7.9066	0.0129	0.3522	0.0945	0.4466	0.1008	0.0868	0.1877	0.0000	1,169.2510	1,169.2510	0.0102	0.0000	1,169.4658
Worker	0.5134	0.6607	6.4946	0.0129	1.1090	8.1500e-003	1.1172	0.2948	7.4600e-003	0.3022	0.0000	962.3268	962.3268	0.0518	0.0000	963.4139
Total	**1.2128**	**6.0756**	**14.4012**	**0.0258**	**1.4612**	**0.1026**	**1.5638**	**0.3956**	**0.0943**	**0.4899**	**0.0000**	**2,131.5778**	**2,131.5778**	**0.0620**	**0.0000**	**2,132.8798**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.4445	3.7201	2.4151	3.5000e-003		0.2567	0.2567		0.2412	0.2412	0.0000	316.0101	316.0101	0.0784	0.0000	317.6560
Total	**0.4445**	**3.7201**	**2.4151**	**3.5000e-003**		**0.2567**	**0.2567**		**0.2412**	**0.2412**	**0.0000**	**316.0101**	**316.0101**	**0.0784**	**0.0000**	**317.6560**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.6994	5.4149	7.9066	0.0129	0.3522	0.0945	0.4466	0.1008	0.0868	0.1877	0.0000	1,169.2510	1,169.2510	0.0102	0.0000	1,169.4658
Worker	0.5134	0.6607	6.4946	0.0129	1.1090	8.1500e-003	1.1172	0.2948	7.4600e-003	0.3022	0.0000	962.3268	962.3268	0.0518	0.0000	963.4139
Total	**1.2128**	**6.0756**	**14.4012**	**0.0258**	**1.4612**	**0.1026**	**1.5638**	**0.3956**	**0.0943**	**0.4899**	**0.0000**	**2,131.5778**	**2,131.5778**	**0.0620**	**0.0000**	**2,132.8798**

3.5 Building Construction - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.4033	3.4327	2.3568	3.4900e-003		0.2316	0.2316		0.2175	0.2175	0.0000	311.3228	311.3228	0.0766	0.0000	312.9319
Total	**0.4033**	**3.4327**	**2.3568**	**3.4900e-003**		**0.2316**	**0.2316**		**0.2175**	**0.2175**	**0.0000**	**311.3228**	**311.3228**	**0.0766**	**0.0000**	**312.9319**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.6285	4.7589	7.3922	0.0128	0.3509	0.0790	0.4299	0.1005	0.0726	0.1731	0.0000	1,145.1427	1,145.1427	9.4500e-003	0.0000	1,145.3410
Worker	0.4471	0.5831	5.6816	0.0129	1.1048	7.7500e-003	1.1125	0.2936	7.1300e-003	0.3008	0.0000	920.8491	920.8491	0.0467	0.0000	921.8296
Total	**1.0756**	**5.3420**	**13.0738**	**0.0257**	**1.4557**	**0.0868**	**1.5425**	**0.3941**	**0.0798**	**0.4739**	**0.0000**	**2,065.9918**	**2,065.9918**	**0.0561**	**0.0000**	**2,067.1707**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.4033	3.4327	2.3568	3.4900e-003		0.2316	0.2316		0.2175	0.2175	0.0000	311.3225	311.3225	0.0766	0.0000	312.9315
Total	**0.4033**	**3.4327**	**2.3568**	**3.4900e-003**		**0.2316**	**0.2316**		**0.2175**	**0.2175**	**0.0000**	**311.3225**	**311.3225**	**0.0766**	**0.0000**	**312.9315**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.6285	4.7589	7.3922	0.0128	0.3509	0.0790	0.4299	0.1005	0.0726	0.1731	0.0000	1,145.1427	1,145.1427	9.4500e-003	0.0000	1,145.3410

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Worker	0.4471	0.5831	5.6816	0.0129	1.1048	7.7500e-003	1.1125	0.2936	7.1300e-003	0.3008	0.0000	920.8491	920.8491	0.0467	0.0000	921.8296
Total	**1.0756**	**5.3420**	**13.0738**	**0.0257**	**1.4557**	**0.0868**	**1.5425**	**0.3941**	**0.0798**	**0.4739**	**0.0000**	**2,065.9918**	**2,065.9918**	**0.0561**	**0.0000**	**2,067.1707**

3.5 Building Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.3483	3.0355	2.2880	3.5000e-003		0.1950	0.1950		0.1833	0.1833	0.0000	308.9844	308.9844	0.0756	0.0000	310.5723
Total	**0.3483**	**3.0355**	**2.2880**	**3.5000e-003**		**0.1950**	**0.1950**		**0.1833**	**0.1833**	**0.0000**	**308.9844**	**308.9844**	**0.0756**	**0.0000**	**310.5723**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.5423	4.2890	6.7455	0.0128	0.3522	0.0726	0.4249	0.1009	0.0668	0.1677	0.0000	1,129.2369	1,129.2369	9.2200e-003	0.0000	1,129.4305
Worker	0.3970	0.5249	5.0786	0.0130	1.1090	7.5900e-003	1.1166	0.2948	7.0200e-003	0.3018	0.0000	892.8982	892.8982	0.0432	0.0000	893.8050
Total	**0.9392**	**4.8139**	**11.8241**	**0.0258**	**1.4613**	**0.0802**	**1.5415**	**0.3956**	**0.0738**	**0.4694**	**0.0000**	**2,022.1352**	**2,022.1352**	**0.0524**	**0.0000**	**2,023.2355**

Mitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Off-Road	0.3483	3.0355	2.2880	3.5000e-003		0.1950	0.1950		0.1833	0.1833	0.0000	308.9841	308.9841	0.0756	0.0000	310.5720
Total	**0.3483**	**3.0355**	**2.2880**	**3.5000e-003**		**0.1950**	**0.1950**		**0.1833**	**0.1833**	**0.0000**	**308.9841**	**308.9841**	**0.0756**	**0.0000**	**310.5720**

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.5423	4.2890	6.7455	0.0128	0.3522	0.0726	0.4249	0.1009	0.0668	0.1677	0.0000	1,129.2369	1,129.2369	9.2200e-003	0.0000	1,129.4305
Worker	0.3970	0.5249	5.0786	0.0130	1.1090	7.5900e-003	1.1166	0.2948	7.0200e-003	0.3018	0.0000	892.8982	892.8982	0.0432	0.0000	893.8050
Total	**0.9392**	**4.8139**	**11.8241**	**0.0258**	**1.4613**	**0.0802**	**1.5415**	**0.3956**	**0.0738**	**0.4694**	**0.0000**	**2,022.1352**	**2,022.1352**	**0.0524**	**0.0000**	**2,023.2355**

3.5 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Off-Road	0.0306	0.2726	0.2226	3.5000e-004		0.0167	0.0167		0.0157	0.0157	0.0000	30.4360	30.4360	7.4100e-003	0.0000	30.5915
Total	**0.0306**	**0.2726**	**0.2226**	**3.5000e-004**		**0.0167**	**0.0167**		**0.0157**	**0.0157**	**0.0000**	**30.4360**	**30.4360**	**7.4100e-003**	**0.0000**	**30.5915**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0488	0.3870	0.6326	1.2800e-003	0.0351	6.6500e-003	0.0417	0.0101	6.1100e-003	0.0162	0.0000	110.5378	110.5378	8.9000e-004	0.0000	110.5564
Worker	0.0358	0.0475	0.4578	1.2900e-003	0.1105	7.4000e-004	0.1112	0.0294	6.9000e-004	0.0301	0.0000	85.7958	85.7958	4.0000e-003	0.0000	85.8797
Total	**0.0846**	**0.4345**	**1.0904**	**2.5700e-003**	**0.1456**	**7.3900e-003**	**0.1530**	**0.0394**	**6.8000e-003**	**0.0462**	**0.0000**	**196.3336**	**196.3336**	**4.8900e-003**	**0.0000**	**196.4361**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0306	0.2726	0.2226	3.5000e-004		0.0167	0.0167		0.0157	0.0157	0.0000	30.4359	30.4359	7.4100e-003	0.0000	30.5914
Total	**0.0306**	**0.2726**	**0.2226**	**3.5000e-004**		**0.0167**	**0.0167**		**0.0157**	**0.0157**	**0.0000**	**30.4359**	**30.4359**	**7.4100e-003**	**0.0000**	**30.5914**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0488	0.3870	0.6326	1.2800e-003	0.0351	6.6500e-003	0.0417	0.0101	6.1100e-003	0.0162	0.0000	110.5378	110.5378	8.9000e-004	0.0000	110.5564
Worker	0.0358	0.0475	0.4578	1.2900e-003	0.1105	7.4000e-004	0.1112	0.0294	6.9000e-004	0.0301	0.0000	85.7958	85.7958	4.0000e-003	0.0000	85.8797
Total	**0.0846**	**0.4345**	**1.0904**	**2.5700e-003**	**0.1456**	**7.3900e-003**	**0.1530**	**0.0394**	**6.8000e-003**	**0.0462**	**0.0000**	**196.3336**	**196.3336**	**4.8900e-003**	**0.0000**	**196.4361**

3.6 Paving - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0535	0.5601	0.5387	8.4000e-004		0.0304	0.0304		0.0279	0.0279	0.0000	75.1480	75.1480	0.0238	0.0000	75.6473
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0535**	**0.5601**	**0.5387**	**8.4000e-004**		**0.0304**	**0.0304**		**0.0279**	**0.0279**	**0.0000**	**75.1480**	**75.1480**	**0.0238**	**0.0000**	**75.6473**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4600e-003	1.9300e-003	0.0186	5.0000e-005	4.5000e-003	3.0000e-005	4.5300e-003	1.2000e-003	3.0000e-005	1.2200e-003	0.0000	3.4923	3.4923	1.6000e-004	0.0000	3.4957
Total	**1.4600e-003**	**1.9300e-003**	**0.0186**	**5.0000e-005**	**4.5000e-003**	**3.0000e-005**	**4.5300e-003**	**1.2000e-003**	**3.0000e-005**	**1.2200e-003**	**0.0000**	**3.4923**	**3.4923**	**1.6000e-004**	**0.0000**	**3.4957**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0535	0.5601	0.5387	8.4000e-004		0.0304	0.0304		0.0279	0.0279	0.0000	75.1479	75.1479	0.0238	0.0000	75.6472
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0535**	**0.5601**	**0.5387**	**8.4000e-004**		**0.0304**	**0.0304**		**0.0279**	**0.0279**	**0.0000**	**75.1479**	**75.1479**	**0.0238**	**0.0000**	**75.6472**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4600e-003	1.9300e-003	0.0186	5.0000e-005	4.5000e-003	3.0000e-005	4.5300e-003	1.2000e-003	3.0000e-005	1.2200e-003	0.0000	3.4923	3.4923	1.6000e-004	0.0000	3.4957
Total	**1.4600e-003**	**1.9300e-003**	**0.0186**	**5.0000e-005**	**4.5000e-003**	**3.0000e-005**	**4.5300e-003**	**1.2000e-003**	**3.0000e-005**	**1.2200e-003**	**0.0000**	**3.4923**	**3.4923**	**1.6000e-004**	**0.0000**	**3.4957**

3.7 Architectural Coating - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	17.5898					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.9900e-003	0.0688	0.0691	1.1000e-004		4.8300e-003	4.8300e-003		4.8300e-003	4.8300e-003	0.0000	9.5747	9.5747	8.1000e-004	0.0000	9.5917
Total	**17.5998**	**0.0688**	**0.0691**	**1.1000e-004**		**4.8300e-003**	**4.8300e-003**		**4.8300e-003**	**4.8300e-003**	**0.0000**	**9.5747**	**9.5747**	**8.1000e-004**	**0.0000**	**9.5917**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0207	0.0275	0.2646	7.5000e-004	0.0639	4.3000e-004	0.0643	0.0170	4.0000e-004	0.0174	0.0000	49.5907	49.5907	2.3100e-003	0.0000	49.6392

Total	**0.0207**	**0.0275**	**0.2646**	**7.5000e-004**	**0.0639**	**4.3000e-004**	**0.0643**	**0.0170**	**4.0000e-004**	**0.0174**	**0.0000**	**49.5907**	**49.5907**	**2.3100e-003**	**0.0000**	**49.6392**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	17.5898					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.9900e-003	0.0688	0.0691	1.1000e-004		4.8300e-003	4.8300e-003		4.8300e-003	4.8300e-003	0.0000	9.5747	9.5747	8.1000e-004	0.0000	9.5917
Total	**17.5998**	**0.0688**	**0.0691**	**1.1000e-004**		**4.8300e-003**	**4.8300e-003**		**4.8300e-003**	**4.8300e-003**	**0.0000**	**9.5747**	**9.5747**	**8.1000e-004**	**0.0000**	**9.5917**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0207	0.0275	0.2646	7.5000e-004	0.0639	4.3000e-004	0.0643	0.0170	4.0000e-004	0.0174	0.0000	49.5907	49.5907	2.3100e-003	0.0000	49.6392
Total	**0.0207**	**0.0275**	**0.2646**	**7.5000e-004**	**0.0639**	**4.3000e-004**	**0.0643**	**0.0170**	**4.0000e-004**	**0.0174**	**0.0000**	**49.5907**	**49.5907**	**2.3100e-003**	**0.0000**	**49.6392**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	9.1968	29.4989	103.3432	0.2271	13.6518	0.4398	14.0916	3.6634	0.4049	4.0683	0.0000	16,982.6605	16,982.6605	0.5284	0.0000	16,993.7577
Unmitigated	9.1968	29.4989	103.3432	0.2271	13.6518	0.4398	14.0916	3.6634	0.4049	4.0683	0.0000	16,982.6605	16,982.6605	0.5284	0.0000	16,993.7577

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Industrial Park	17,608.80	6,299.70	1846.90	36,027,891	36,027,891
Total	17,608.80	6,299.70	1,846.90	36,027,891	36,027,891

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Industrial Park	9.50	7.30	7.30	59.00	28.00	13.00	79	19	2

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.438302	0.063917	0.163234	0.169914	0.042886	0.007084	0.019490	0.082149	0.002063	0.001756	0.006579	0.000764	0.001861

5.0 Energy Detail

4.4 Fleet Mix

Historical Energy Use: N

5.1 Mitigation Measures Energy

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	7,448.3808	7,448.3808	0.3368	0.0697	7,477.0548
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	7,448.3808	7,448.3808	0.3368	0.0697	7,477.0548
NaturalGas Mitigated	0.1872	1.7016	1.4293	0.0102		0.1293	0.1293		0.1293	0.1293	0.0000	1,852.3432	1,852.3432	0.0355	0.0340	1,863.6162
NaturalGas Unmitigated	0.1872	1.7016	1.4293	0.0102		0.1293	0.1293		0.1293	0.1293	0.0000	1,852.3432	1,852.3432	0.0355	0.0340	1,863.6162

5.2 Energy by Land Use - NaturalGas

Unmitigated

Land Use	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	kBTU/yr	tons/yr										MT/yr					
Industrial Park	3.47116e+007	0.1872	1.7016	1.4293	0.0102		0.1293	0.1293		0.1293	0.1293	0.0000	1,852.3432	1,852.3432	0.0355	0.0340	1,863.6162
Total		**0.1872**	**1.7016**	**1.4293**	**0.0102**		**0.1293**	**0.1293**		**0.1293**	**0.1293**	**0.0000**	**1,852.3432**	**1,852.3432**	**0.0355**	**0.0340**	**1,863.6162**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Land Use	kBTU/yr	tons/yr										MT/yr					
Industrial Park	3.47116e+007	0.1872	1.7016	1.4293	0.0102		0.1293	0.1293		0.1293	0.1293	0.0000	1,852.3432	1,852.3432	0.0355	0.0340	1,863.6162
Total		**0.1872**	**1.7016**	**1.4293**	**0.0102**		**0.1293**	**0.1293**		**0.1293**	**0.1293**	**0.0000**	**1,852.3432**	**1,852.3432**	**0.0355**	**0.0340**	**1,863.6162**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Industrial Park	2.56036e+007	7,448.3808	0.3368	0.0697	7,477.0548
Total		**7,448.3808**	**0.3368**	**0.0697**	**7,477.0548**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Industrial Park	2.56036e+007	7,448.3808	0.3368	0.0697	7,477.0548
Total		**7,448.3808**	**0.3368**	**0.0697**	**7,477.0548**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	11.6421	2.2000e-004	0.0235	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005	0.0000	0.0452	0.0452	1.2000e-004	0.0000	0.0478
Unmitigated	11.6421	2.2000e-004	0.0235	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005	0.0000	0.0452	0.0452	1.2000e-004	0.0000	0.0478

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	1.7590					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	9.8809					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.2200e-003	2.2000e-004	0.0235	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005	0.0000	0.0452	0.0452	1.2000e-004	0.0000	0.0478
Total	**11.6421**	**2.2000e-004**	**0.0235**	**0.0000**		**8.0000e-005**	**8.0000e-005**		**8.0000e-005**	**8.0000e-005**	**0.0000**	**0.0452**	**0.0452**	**1.2000e-004**	**0.0000**	**0.0478**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	1.7590					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	9.8809					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.2200e-003	2.2000e-004	0.0235	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005	0.0000	0.0452	0.0452	1.2000e-004	0.0000	0.0478
Total	**11.6421**	**2.2000e-004**	**0.0235**	**0.0000**		**8.0000e-005**	**8.0000e-005**		**8.0000e-005**	**8.0000e-005**	**0.0000**	**0.0452**	**0.0452**	**1.2000e-004**	**0.0000**	**0.0478**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	1,106.5731	19.1024	0.4580	1,649.7181
Unmitigated	1,106.5731	19.1059	0.4588	1,650.0143

7.2 Water by Land Use

<u>Unmitigated</u>

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e

Land Use	Mgal	MT/yr			
Industrial Park	585.063 / 0	1,106.5731	19.1059	0.4588	1,650.0143
Total		**1,106.5731**	**19.1059**	**0.4588**	**1,650.0143**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Industrial Park	585.063 / 0	1,106.5731	19.1024	0.4580	1,649.7181
Total		**1,106.5731**	**19.1024**	**0.4580**	**1,649.7181**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	636.8233	37.6352	0.0000	1,427.1619

Unmitigated	636.8233	37.6352	0.0000	1,427.161 9

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Industrial Park	3137.2	636.8233	37.6352	0.0000	1,427.161 9
Total		**636.8233**	**37.6352**	**0.0000**	**1,427.161 9**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Industrial Park	3137.2	636.8233	37.6352	0.0000	1,427.161 9
Total		**636.8233**	**37.6352**	**0.0000**	**1,427.161 9**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Vegetation

Fresno WRMP - Regional Transmission Facilities

Fresno County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
	772.00		0.00	772,000.00	0

1.2 Other Project Characteristics

Urbanization Urban **Wind Speed (m/s)** 2.2 **Precipitation Freq (Days)** 45

Climate Zone 3 **Operational Year** 2030

Utility Company Pacific Gas & Electric Company

CO2 Intensity (lb/MWhr) 641.35 **CH4 Intensity (lb/MWhr)** 0.029 **N2O Intensity (lb/MWhr)** 0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Project applicant provided figure of 772,000 of pipeline. Assume pipeline is on average on foot wide.

Construction Phase - Construction schedule of 2018 - 2020, as provided by the project applicant. Limited Grading, and modification to existing facilities.

Grading - 1,360,000 CY of export, and 136,000 CY of import provided by the project applicant.

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	0.00	2,088.00
tblConstructionPhase	NumDays	0.00	782.00
tblConstructionPhase	NumDays	0.00	523.00
tblConstructionPhase	PhaseEndDate	12/31/2026	1/2/2018
tblConstructionPhase	PhaseEndDate	1/1/2019	12/31/2018

tblConstructionPhase	PhaseStartDate	1/1/2019	1/1/2018
tblConstructionPhase	PhaseStartDate	1/2/2016	1/1/2016
tblGrading	AcresOfGrading	261.50	0.00
tblGrading	MaterialExported	0.00	1,360,000.00
tblGrading	MaterialImported	0.00	136,000.00
tblProjectCharacteristics	OperationalYear	2014	2030

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2014	0.1903	1.8938	1.0042	1.2800e-003	5.2200e-003	0.1165	0.1217	1.3900e-003	0.1071	0.1085	0.0000	122.6819	122.6819	0.0351	0.0000	123.4194
2015	0.1883	1.8697	1.0011	1.2800e-003	5.2200e-003	0.1148	0.1201	1.3900e-003	0.1057	0.1070	0.0000	121.2573	121.2573	0.0351	0.0000	121.9938
2016	0.8785	9.7968	8.9039	0.0251	1.7216	0.2341	1.9557	0.5201	0.2190	0.7391	0.0000	2,283.6329	2,283.6329	0.0449	0.0000	2,284.5755
2017	0.8102	8.6259	8.5000	0.0249	1.7210	0.2054	1.9264	0.5199	0.1921	0.7120	0.0000	2,235.8069	2,235.8069	0.0431	0.0000	2,236.7110
2018	0.7275	7.7531	7.9836	0.0250	1.7250	0.1902	1.9152	0.5210	0.1778	0.6988	0.0000	2,211.5211	2,211.5211	0.0428	0.0000	2,212.4194
Total	**2.7947**	**29.9393**	**27.3929**	**0.0775**	**5.1779**	**0.8610**	**6.0389**	**1.5638**	**0.8016**	**2.3654**	**0.0000**	**6,974.9001**	**6,974.9001**	**0.2009**	**0.0000**	**6,979.1189**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Year	tons/yr										MT/yr					
2014	0.1903	1.8938	1.0042	1.2800e-003	5.2200e-003	0.1165	0.1217	1.3900e-003	0.1071	0.1085	0.0000	122.6818	122.6818	0.0351	0.0000	123.4192
2015	0.1883	1.8697	1.0011	1.2800e-003	5.2200e-003	0.1148	0.1201	1.3900e-003	0.1057	0.1070	0.0000	121.2572	121.2572	0.0351	0.0000	121.9936
2016	0.8785	9.7967	8.9039	0.0251	1.7216	0.2341	1.9557	0.5201	0.2190	0.7391	0.0000	2,283.6327	2,283.6327	0.0449	0.0000	2,284.5753
2017	0.8102	8.6259	8.5000	0.0249	1.7210	0.2054	1.9264	0.5199	0.1921	0.7120	0.0000	2,235.8067	2,235.8067	0.0431	0.0000	2,236.7108
2018	0.7275	7.7531	7.9836	0.0250	1.7250	0.1902	1.9152	0.5210	0.1778	0.6988	0.0000	2,211.5210	2,211.5210	0.0428	0.0000	2,212.4192
Total	**2.7947**	**29.9393**	**27.3928**	**0.0775**	**5.1779**	**0.8610**	**6.0389**	**1.5638**	**0.8016**	**2.3654**	**0.0000**	**6,974.8994**	**6,974.8994**	**0.2009**	**0.0000**	**6,979.1181**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	3.5524	6.0000e-005	7.0600e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.0138	0.0138	4.0000e-005	0.0000	0.0145
Total	**3.5524**	**6.0000e-005**	**7.0600e-003**	**0.0000**		**3.0000e-005**	**3.0000e-005**		**3.0000e-005**	**3.0000e-005**	**0.0000**	**0.0138**	**0.0138**	**4.0000e-005**	**0.0000**	**0.0145**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	3.5524	6.0000e-005	7.0600e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.0138	0.0138	4.0000e-005	0.0000	0.0145
Total	**3.5524**	**6.0000e-005**	**7.0600e-003**	**0.0000**		**3.0000e-005**	**3.0000e-005**		**3.0000e-005**	**3.0000e-005**	**0.0000**	**0.0138**	**0.0138**	**4.0000e-005**	**0.0000**	**0.0145**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	1/1/2014	1/1/2016	5	523	
2	Grading	Grading	1/1/2016	12/31/2018	5	782	
3	Building Construction	Building Construction	1/1/2018	1/2/2018	5	2088	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Concrete/Industrial Saws	1	8.00	81	0.73
Site Preparation	Graders	1	8.00	174	0.41

Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Rubber Tired Dozers	1	1.00	255	0.40
Grading	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Building Construction	Cranes	1	4.00	226	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Building Construction	Tractors/Loaders/Backhoes	2	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	2	5.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	0.00	187,000.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	5	324.00	127.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2014

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1872	1.8899	0.9649	1.2200e-003		0.1164	0.1164		0.1071	0.1071	0.0000	117.8190	117.8190	0.0348	0.0000	118.5502
Total	**0.1872**	**1.8899**	**0.9649**	**1.2200e-003**	**0.0000**	**0.1164**	**0.1164**	**0.0000**	**0.1071**	**0.1071**	**0.0000**	**117.8190**	**117.8190**	**0.0348**	**0.0000**	**118.5502**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.1000e-003	3.9700e-003	0.0393	6.0000e-005	5.2200e-003	4.0000e-005	5.2600e-003	1.3900e-003	4.0000e-005	1.4300e-003	0.0000	4.8629	4.8629	3.0000e-004	0.0000	4.8692
Total	**3.1000e-003**	**3.9700e-003**	**0.0393**	**6.0000e-005**	**5.2200e-003**	**4.0000e-005**	**5.2600e-003**	**1.3900e-003**	**4.0000e-005**	**1.4300e-003**	**0.0000**	**4.8629**	**4.8629**	**3.0000e-004**	**0.0000**	**4.8692**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1872	1.8899	0.9649	1.2200e-003		0.1164	0.1164		0.1071	0.1071	0.0000	117.8189	117.8189	0.0348	0.0000	118.5500
Total	**0.1872**	**1.8899**	**0.9649**	**1.2200e-003**	**0.0000**	**0.1164**	**0.1164**	**0.0000**	**0.1071**	**0.1071**	**0.0000**	**117.8189**	**117.8189**	**0.0348**	**0.0000**	**118.5500**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.1000e-003	3.9700e-003	0.0393	6.0000e-005	5.2200e-003	4.0000e-005	5.2600e-003	1.3900e-003	4.0000e-005	1.4300e-003	0.0000	4.8629	4.8629	3.0000e-004	0.0000	4.8692
Total	**3.1000e-003**	**3.9700e-003**	**0.0393**	**6.0000e-005**	**5.2200e-003**	**4.0000e-005**	**5.2600e-003**	**1.3900e-003**	**4.0000e-005**	**1.4300e-003**	**0.0000**	**4.8629**	**4.8629**	**3.0000e-004**	**0.0000**	**4.8692**

3.2 Site Preparation - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1856	1.8661	0.9665	1.2200e-003		0.1148	0.1148		0.1056	0.1056	0.0000	116.5590	116.5590	0.0348	0.0000	117.2898
Total	**0.1856**	**1.8661**	**0.9665**	**1.2200e-003**	**0.0000**	**0.1148**	**0.1148**	**0.0000**	**0.1056**	**0.1056**	**0.0000**	**116.5590**	**116.5590**	**0.0348**	**0.0000**	**117.2898**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.7400e-003	3.5100e-003	0.0346	6.0000e-005	5.2200e-003	4.0000e-005	5.2600e-003	1.3900e-003	4.0000e-005	1.4200e-003	0.0000	4.6983	4.6983	2.7000e-004	0.0000	4.7040

Total	2.7400e-003	3.5100e-003	0.0346	6.0000e-005	5.2200e-003	4.0000e-005	5.2600e-003	1.3900e-003	4.0000e-005	1.4200e-003	0.0000	4.6983	4.6983	2.7000e-004	0.0000	4.7040

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1856	1.8661	0.9665	1.2200e-003		0.1148	0.1148		0.1056	0.1056	0.0000	116.5589	116.5589	0.0348	0.0000	117.2896
Total	**0.1856**	**1.8661**	**0.9665**	**1.2200e-003**	**0.0000**	**0.1148**	**0.1148**	**0.0000**	**0.1056**	**0.1056**	**0.0000**	**116.5589**	**116.5589**	**0.0348**	**0.0000**	**117.2896**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.7400e-003	3.5100e-003	0.0346	6.0000e-005	5.2200e-003	4.0000e-005	5.2600e-003	1.3900e-003	4.0000e-005	1.4200e-003	0.0000	4.6983	4.6983	2.7000e-004	0.0000	4.7040
Total	**2.7400e-003**	**3.5100e-003**	**0.0346**	**6.0000e-005**	**5.2200e-003**	**4.0000e-005**	**5.2600e-003**	**1.3900e-003**	**4.0000e-005**	**1.4200e-003**	**0.0000**	**4.6983**	**4.6983**	**2.7000e-004**	**0.0000**	**4.7040**

3.2 Site Preparation - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.8000e-004	6.8200e-003	3.6700e-003	0.0000		4.2000e-004	4.2000e-004		3.8000e-004	3.8000e-004	0.0000	0.4414	0.4414	1.3000e-004	0.0000	0.4442
Total	**6.8000e-004**	**6.8200e-003**	**3.6700e-003**	**0.0000**	**0.0000**	**4.2000e-004**	**4.2000e-004**	**0.0000**	**3.8000e-004**	**3.8000e-004**	**0.0000**	**0.4414**	**0.4414**	**1.3000e-004**	**0.0000**	**0.4442**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-005	1.0000e-005	1.2000e-004	0.0000	2.0000e-005	0.0000	2.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0173	0.0173	0.0000	0.0000	0.0174
Total	**1.0000e-005**	**1.0000e-005**	**1.2000e-004**	**0.0000**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0173**	**0.0173**	**0.0000**	**0.0000**	**0.0174**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.8000e-004	6.8200e-003	3.6700e-003	0.0000		4.2000e-004	4.2000e-004		3.8000e-004	3.8000e-004	0.0000	0.4414	0.4414	1.3000e-004	0.0000	0.4442
Total	**6.8000e-004**	**6.8200e-003**	**3.6700e-003**	**0.0000**	**0.0000**	**4.2000e-004**	**4.2000e-004**	**0.0000**	**3.8000e-004**	**3.8000e-004**	**0.0000**	**0.4414**	**0.4414**	**1.3000e-004**	**0.0000**	**0.4442**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-005	1.0000e-005	1.2000e-004	0.0000	2.0000e-005	0.0000	2.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0173	0.0173	0.0000	0.0000	0.0174
Total	**1.0000e-005**	**1.0000e-005**	**1.2000e-004**	**0.0000**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0173**	**0.0173**	**0.0000**	**0.0000**	**0.0174**

3.3 Grading - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.3789	0.0000	0.3789	0.1746	0.0000	0.1746	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1713	1.4666	1.1360	1.5700e-003		0.1049	0.1049		0.1001	0.1001	0.0000	141.3087	141.3087	0.0283	0.0000	141.9020
Total	**0.1713**	**1.4666**	**1.1360**	**1.5700e-003**	**0.3789**	**0.1049**	**0.4838**	**0.1746**	**0.1001**	**0.2747**	**0.0000**	**141.3087**	**141.3087**	**0.0283**	**0.0000**	**141.9020**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.7017	8.3171	7.7031	0.0234	1.3322	0.1287	1.4609	0.3427	0.1184	0.4611	0.0000	2,132.8125	2,132.8125	0.0160	0.0000	2,133.1488
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.8300e-003	6.2200e-003	0.0611	1.2000e-004	0.0104	8.0000e-005	0.0105	2.7700e-003	7.0000e-005	2.8400e-003	0.0000	9.0529	9.0529	4.9000e-004	0.0000	9.0632
Total	**0.7066**	**8.3233**	**7.7642**	**0.0235**	**1.3426**	**0.1288**	**1.4714**	**0.3455**	**0.1184**	**0.4639**	**0.0000**	**2,141.8654**	**2,141.8654**	**0.0165**	**0.0000**	**2,142.2120**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.3789	0.0000	0.3789	0.1746	0.0000	0.1746	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1713	1.4666	1.1360	1.5700e-003		0.1049	0.1049		0.1001	0.1001	0.0000	141.3085	141.3085	0.0283	0.0000	141.9018
Total	**0.1713**	**1.4666**	**1.1360**	**1.5700e-003**	**0.3789**	**0.1049**	**0.4838**	**0.1746**	**0.1001**	**0.2747**	**0.0000**	**141.3085**	**141.3085**	**0.0283**	**0.0000**	**141.9018**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.7017	8.3171	7.7031	0.0234	1.3322	0.1287	1.4609	0.3427	0.1184	0.4611	0.0000	2,132.8125	2,132.8125	0.0160	0.0000	2,133.1488
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.8300e-003	6.2200e-003	0.0611	1.2000e-004	0.0104	8.0000e-005	0.0105	2.7700e-003	7.0000e-005	2.8400e-003	0.0000	9.0529	9.0529	4.9000e-004	0.0000	9.0632
Total	**0.7066**	**8.3233**	**7.7642**	**0.0235**	**1.3426**	**0.1288**	**1.4714**	**0.3455**	**0.1184**	**0.4639**	**0.0000**	**2,141.8654**	**2,141.8654**	**0.0165**	**0.0000**	**2,142.2120**

3.3 Grading - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.3789	0.0000	0.3789	0.1746	0.0000	0.1746	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1566	1.3619	1.1157	1.5600e-003		0.0945	0.0945		0.0901	0.0901	0.0000	139.6118	139.6118	0.0275	0.0000	140.1896
Total	**0.1566**	**1.3619**	**1.1157**	**1.5600e-003**	**0.3789**	**0.0945**	**0.4734**	**0.1746**	**0.0901**	**0.2647**	**0.0000**	**139.6118**	**139.6118**	**0.0275**	**0.0000**	**140.1896**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.6493	7.2585	7.3308	0.0232	1.3317	0.1108	1.4425	0.3426	0.1019	0.4445	0.0000	2,087.5323	2,087.5323	0.0151	0.0000	2,087.8495

Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.2100e-003	5.4900e-003	0.0535	1.2000e-004	0.0104	7.0000e-005	0.0105	2.7600e-003	7.0000e-005	2.8300e-003	0.0000	8.6627	8.6627	4.4000e-004	0.0000	8.6720
Total	**0.6535**	**7.2640**	**7.3843**	**0.0233**	**1.3421**	**0.1109**	**1.4530**	**0.3453**	**0.1020**	**0.4473**	**0.0000**	**2,096.1950**	**2,096.1950**	**0.0155**	**0.0000**	**2,096.5214**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.3789	0.0000	0.3789	0.1746	0.0000	0.1746	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1566	1.3619	1.1157	1.5600e-003		0.0945	0.0945		0.0901	0.0901	0.0000	139.6117	139.6117	0.0275	0.0000	140.1894
Total	**0.1566**	**1.3619**	**1.1157**	**1.5600e-003**	**0.3789**	**0.0945**	**0.4734**	**0.1746**	**0.0901**	**0.2647**	**0.0000**	**139.6117**	**139.6117**	**0.0275**	**0.0000**	**140.1894**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.6493	7.2585	7.3308	0.0232	1.3317	0.1108	1.4425	0.3426	0.1019	0.4445	0.0000	2,087.5323	2,087.5323	0.0151	0.0000	2,087.8495
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.2100e-003	5.4900e-003	0.0535	1.2000e-004	0.0104	7.0000e-005	0.0105	2.7600e-003	7.0000e-005	2.8300e-003	0.0000	8.6627	8.6627	4.4000e-004	0.0000	8.6720
Total	**0.6535**	**7.2640**	**7.3843**	**0.0233**	**1.3421**	**0.1109**	**1.4530**	**0.3453**	**0.1020**	**0.4473**	**0.0000**	**2,096.1950**	**2,096.1950**	**0.0155**	**0.0000**	**2,096.5214**

3.3 Grading - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.3789	0.0000	0.3789	0.1746	0.0000	0.1746	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1374	1.2165	1.0896	1.5700e-003		0.0801	0.0801		0.0765	0.0765	0.0000	138.9701	138.9701	0.0269	0.0000	139.5340
Total	**0.1374**	**1.2165**	**1.0896**	**1.5700e-003**	**0.3789**	**0.0801**	**0.4590**	**0.1746**	**0.0765**	**0.2511**	**0.0000**	**138.9701**	**138.9701**	**0.0269**	**0.0000**	**139.5340**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.5831	6.5095	6.8108	0.0232	1.3322	0.1091	1.4413	0.3427	0.1004	0.4431	0.0000	2,058.3833	2,058.3833	0.0151	0.0000	2,058.6998
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.7300e-003	4.9400e-003	0.0478	1.2000e-004	0.0104	7.0000e-005	0.0105	2.7700e-003	7.0000e-005	2.8400e-003	0.0000	8.3998	8.3998	4.1000e-004	0.0000	8.4083
Total	**0.5868**	**6.5144**	**6.8586**	**0.0234**	**1.3426**	**0.1092**	**1.4518**	**0.3455**	**0.1005**	**0.4460**	**0.0000**	**2,066.7831**	**2,066.7831**	**0.0155**	**0.0000**	**2,067.1081**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.3789	0.0000	0.3789	0.1746	0.0000	0.1746	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1374	1.2165	1.0896	1.5700e-003		0.0801	0.0801		0.0765	0.0765	0.0000	138.9699	138.9699	0.0269	0.0000	139.5338
Total	**0.1374**	**1.2165**	**1.0896**	**1.5700e-003**	**0.3789**	**0.0801**	**0.4590**	**0.1746**	**0.0765**	**0.2511**	**0.0000**	**138.9699**	**138.9699**	**0.0269**	**0.0000**	**139.5338**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.5831	6.5095	6.8108	0.0232	1.3322	0.1091	1.4413	0.3427	0.1004	0.4431	0.0000	2,058.3833	2,058.3833	0.0151	0.0000	2,058.6998
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.7300e-003	4.9400e-003	0.0478	1.2000e-004	0.0104	7.0000e-005	0.0105	2.7700e-003	7.0000e-005	2.8400e-003	0.0000	8.3998	8.3998	4.1000e-004	0.0000	8.4083
Total	**0.5868**	**6.5144**	**6.8586**	**0.0234**	**1.3426**	**0.1092**	**1.4518**	**0.3455**	**0.1005**	**0.4460**	**0.0000**	**2,066.7831**	**2,066.7831**	**0.0155**	**0.0000**	**2,067.1081**

3.4 Building Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.0800e-003	0.0110	7.7200e-003	1.0000e-005		7.1000e-004	7.1000e-004		6.5000e-004	6.5000e-004	0.0000	1.0344	1.0344	3.2000e-004	0.0000	1.0412

Total	**1.0800e-003**	**0.0110**	**7.7200e-003**	**1.0000e-005**		**7.1000e-004**	**7.1000e-004**		**6.5000e-004**	**6.5000e-004**	**0.0000**	**1.0344**	**1.0344**	**3.2000e-004**	**0.0000**	**1.0412**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.2700e-003	0.0101	0.0158	3.0000e-005	8.3000e-004	1.7000e-004	1.0000e-003	2.4000e-004	1.6000e-004	3.9000e-004	0.0000	2.6481	2.6481	2.0000e-005	0.0000	2.6485
Worker	9.3000e-004	1.2300e-003	0.0119	3.0000e-005	2.5900e-003	2.0000e-005	2.6100e-003	6.9000e-004	2.0000e-005	7.0000e-004	0.0000	2.0855	2.0855	1.0000e-004	0.0000	2.0876
Total	**2.2000e-003**	**0.0113**	**0.0277**	**6.0000e-005**	**3.4200e-003**	**1.9000e-004**	**3.6100e-003**	**9.3000e-004**	**1.8000e-004**	**1.0900e-003**	**0.0000**	**4.7335**	**4.7335**	**1.2000e-004**	**0.0000**	**4.7361**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.0800e-003	0.0110	7.7200e-003	1.0000e-005		7.1000e-004	7.1000e-004		6.5000e-004	6.5000e-004	0.0000	1.0344	1.0344	3.2000e-004	0.0000	1.0412
Total	**1.0800e-003**	**0.0110**	**7.7200e-003**	**1.0000e-005**		**7.1000e-004**	**7.1000e-004**		**6.5000e-004**	**6.5000e-004**	**0.0000**	**1.0344**	**1.0344**	**3.2000e-004**	**0.0000**	**1.0412**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.2700e-003	0.0101	0.0158	3.0000e-005	8.3000e-004	1.7000e-004	1.0000e-003	2.4000e-004	1.6000e-004	3.9000e-004	0.0000	2.6481	2.6481	2.0000e-005	0.0000	2.6485
Worker	9.3000e-004	1.2300e-003	0.0119	3.0000e-005	2.5900e-003	2.0000e-005	2.6100e-003	6.9000e-004	2.0000e-005	7.0000e-004	0.0000	2.0855	2.0855	1.0000e-004	0.0000	2.0876
Total	**2.2000e-003**	**0.0113**	**0.0277**	**6.0000e-005**	**3.4200e-003**	**1.9000e-004**	**3.6100e-003**	**9.3000e-004**	**1.8000e-004**	**1.0900e-003**	**0.0000**	**4.7335**	**4.7335**	**1.2000e-004**	**0.0000**	**4.7361**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Total					

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.441286	0.064999	0.162854	0.166959	0.043279	0.007061	0.019581	0.080766	0.002046	0.001783	0.006858	0.000660	0.001869

5.0 Energy Detail

4.4 Fleet Mix

Historical Energy Use: N

5.1 Mitigation Measures Energy

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	3.5524	6.0000e-005	7.0600e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.0138	0.0138	4.0000e-005	0.0000	0.0145
Unmitigated	3.5524	6.0000e-005	7.0600e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.0138	0.0138	4.0000e-005	0.0000	0.0145

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.5367					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	3.0151					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Landscaping	6.5000e-004	6.0000e-005	7.0600e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.0138	0.0138	4.0000e-005	0.0000	0.0145
Total	**3.5524**	**6.0000e-005**	**7.0600e-003**	**0.0000**		**3.0000e-005**	**3.0000e-005**		**3.0000e-005**	**3.0000e-005**	**0.0000**	**0.0138**	**0.0138**	**4.0000e-005**	**0.0000**	**0.0145**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Consumer Products	3.0151					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	6.5000e-004	6.0000e-005	7.0600e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.0138	0.0138	4.0000e-005	0.0000	0.0145
Architectural Coating	0.5367					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**3.5524**	**6.0000e-005**	**7.0600e-003**	**0.0000**		**3.0000e-005**	**3.0000e-005**		**3.0000e-005**	**3.0000e-005**	**0.0000**	**0.0138**	**0.0138**	**4.0000e-005**	**0.0000**	**0.0145**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Vegetation

Appendix G
Traffic Impact Study

Traffic Impact Study

Proposed City of Fresno Southeast Surface Water Treatment Facility

Northwest of the Intersection of Armstrong and Olive Avenues

Fresno, California

Prepared For:

West Yost Associates
7041 Koll Center Parkway, Suite 110
Pleasanton, California 94566

Date:

January 2014

Job No.:

11-058.01

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Elizabeth Drayer, P.E. January 2014
West Yost Associates
7041 Koll Center Parkway, Suite 110
Pleasanton, California 94566

Subject: Traffic Impact Study
Proposed City of Fresno Southeast Surface Water Treatment Facility
Northwest of the Intersection of Armstrong and Olive Avenues
Fresno, California

Dear Ms. Drayer:

We are pleased to submit this Traffic Impact Study report for the proposed City of Fresno Southeast Surface Water Treatment Facility. This report was prepared in accordance with the requirements of the City of Fresno and identifies deficiencies in the existing and/or planned transportation system as well as Project impacts. Recommendations are provided to mitigate Project impacts.

Thank you for the opportunity to perform this traffic impact study and to provide you with this report. Please feel free to contact our office if you have any questions or comments regarding this report, or if we can be of further assistance.

Sincerely,

PETERS ENGINEERING GROUP

John Rowland, PE, TE

REGISTERED PROFESSIONAL ENGINEER
JOHN ROWLAND
NO. 2484
EXP. 6-30-14
TRAFFIC
STATE OF CALIFORNIA

EXECUTIVE SUMMARY

This traffic impact study (TIS) has been prepared to study the potential traffic impacts related to the proposed City of Fresno Southeast Surface Water Treatment Facility in Fresno, California, hereinafter referred to as the "Project."

The TIS was prepared to investigate potential traffic impacts resulting from the Project in both the near-term and long-term cumulative (year 2035) conditions. The analysis focuses on the anticipated effect of vehicle traffic on study area intersections and roadway segments. Additional discussions are included related to transit facilities, bicycle facilities, pedestrian facilities, and regional transportation concepts.

The Project will be located on approximately 58 acres bounded by Olive Avenue on the south, Armstrong Avenue on the east, Floradora Avenue on the north, and existing parcels to the west. The facility is proposed to ultimately include a new water treatment plant and operations center capable of treating 80 million gallons per day (mgd), new City of Fresno Water Division corporation yard, and Water Division administrative offices at the site. The project may also include an education center and demonstration garden. Site access will be provided via driveways connecting to Floradora and Olive Avenues.

The project is envisioned to be developed in three phases as follows:

- Phase 1: 40 mgd SWTF and operations building
- Phase 2: 40 mgd expansion of existing SWTF (resulting total of 80 mgd)
- Phase 3: Water Division corporation yard and administrative offices

The TIS evaluates the following scenarios:

Baseline Conditions

- Existing Conditions;

No-Project Conditions (for informational purposes only)

- Long-Term (Year 2035) No-Project Conditions;
- Long-Term (Year 2035) No-Project Conditions (with McKinley Avenue realignment).

Project Conditions

- Existing Plus Phases 1 and 2 Project Conditions;
- Existing Plus Phases 1 through 3 Project Conditions;
- Near-Term With Phases 1 and 2 Project Conditions (includes approved and pending projects);
- Near-Term With Phases 1 through 3 Project Conditions (includes approved and pending projects);
- Year 2035 With Phases 1 through 3 Project Conditions;
- Year 2035 With Phases 1 through 3 Project Conditions (with McKinley realignment).

The study intersections and road segments were determined based on the anticipated volume and distribution of Project traffic. A scoping letter dated March 29, 2012 was provided to local agencies and the scope of the study was finalized based on the responses received.

The TIS includes analysis of the following intersections:

1. Fowler and Floradora Avenues
2. Armstrong and Floradora Avenues
3. Fowler and Olive Avenues
4. Armstrong and Olive Avenues
5. Floradora Avenue and Site Access
6. Olive Avenue and Site Access

The TIS includes analysis of the following road segments:

1. Fowler Avenue between Floradora and Olive Avenues
2. Armstrong Avenue between Floradora and Olive Avenues
3. Floradora Avenue between Fowler and Armstrong Avenues
4. Olive Avenue between Fowler and Armstrong Avenues

The California Public Utilities Commission (CPUC) requested that the existing at-grade railroad crossing on Olive Avenue immediately east of Clovis Avenue be considered in the analyses.

Generally-accepted traffic engineering principles and methods were employed to estimate the amount of traffic expected to be generated by the Project and to analyze the traffic conditions expected to occur in the future. The traffic impact study concludes that substandard conditions are expected to occur at several of the study intersections and road segments without the Project as development progresses in the Fresno area. The Project is expected to cause or contribute to significant impacts at the roadway segments and intersections studied.

The Project will be required to mitigate the significant impacts as described herein and summarized in the table below. The Project is required to construct the mitigations that are identified based on the existing-plus-Project scenarios. The Project is required to contribute its fair share of mitigations identified in the cumulative (near-term and year 2035) scenarios with payment of the applicable City of Fresno TSMI and FMSI fees. The cost of facilities constructed by the Project that are within the TSMI and FMSI programs shall be credited against the required fee.

Existing-Plus-Project Phases 1 and 2

The Existing Plus Project Phases 1 and 2 analyses indicate that Phases 1 and 2 of the Project will not create significant impacts.

Existing-Plus-Project Phases 1 Through 3

The following impact and associated mitigation are based on Existing Plus Project Phases 1 Through 3 conditions. The mitigation shall be constructed by the Project prior to the opening of Phase 3. The cost of the mitigation shall be credited against the TSMI and FMSI fees and the Project will be eligible for reimbursement of costs in excess of the Project’s required fees.

Impact E-1

At the intersection of Fowler and Olive Avenues, after construction of Phases 1 and 2 of the Project, Phase 3 of the Project will cause the a.m. peak hour LOS to drop from LOS E to LOS F and will exacerbate a substandard LOS F by more than 5.0 seconds during the p.m. peak hour.

Mitigation E-1

Phase 3 of the Project shall construct this mitigation. The intersection of Fowler and Olive Avenues shall be signalized in accordance with City of Fresno standards including protected left-turn phasing and the following minimum lane configurations:

Eastbound:	one left-turn lane and a shared through/right-turn lane
Westbound:	two left-turn lanes and a shared through/right-turn lane
Northbound:	one left-turn lane and a shared through/right-turn lane
Southbound:	one left-turn lane and a shared through/right-turn lane

With implementation of this mitigation the intersection will operate at LOS C and 95th-percentile queues in the left-turn and right-turn lanes will be 219 feet or less. Therefore, standard City of Fresno turn lanes are recommended.

This mitigation is potentially constrained by existing businesses and residences.

Near-Term With-Project Phases 1 and 2

The following cumulative impacts and the associated mitigations are based on Near-Term With-Project Phases 1 and 2 conditions. The Project shall mitigate its share of the cumulative impacts with payment of the City of Fresno TSMI and FMSI fees.

Impact NT2-1

Phases 1 and 2 of the Project contribute to a significant cumulative impact in the near-term condition based on intersection LOS criteria at the intersection of Fowler and Olive Avenues. The cumulative projects will cause the a.m. peak hour LOS to drop from LOS E to LOS F and will exacerbate a substandard LOS F by more than 5.0 seconds during the p.m. peak hour.

Mitigation NT2-1

The intersection of Fowler and Olive Avenues shall be signalized in accordance with City of Fresno standards including protected left-turn phasing and the following minimum lane configurations:

Eastbound:	one left-turn lane and a shared through/right-turn lane
Westbound:	two left-turn lanes and a shared through/right-turn lane
Northbound:	one left-turn lane and a shared through/right-turn lane
Southbound:	one left-turn lane and a shared through/right-turn lane

With implementation of this mitigation the intersection will operate at LOS C and 95th-percentile queues in the left-turn and right-turn lanes will be 189 feet or less. Therefore, standard City of Fresno turn lanes are recommended.

This mitigation is potentially constrained by existing businesses and residences.

Phases 1 and 2 of the Project shall pay the applicable TSMI and FMSI fees to mitigate the Project's fair share of this cumulative impact.

Impact NT2-2

Phases 1 and 2 of the Project contribute to a significant cumulative impact in the near-term condition based on road segment LOS criteria on Fowler Avenue between Olive and Floradora Avenues. The cumulative projects will cause the p.m. peak hour LOS to drop from LOS C to LOS E.

Mitigation NT2-2

Fowler Avenue between Olive and Floradora Avenues shall be widened to four lanes with a median per City of Fresno standards. In order to effectively utilize the additional lanes, the widening project shall extend south of Olive Avenue to match the existing four-lane section of Fowler Avenue. With implementation of this mitigation Fowler Avenue will operate at LOS B during the peak hours.

This mitigation is potentially constrained by existing businesses and residences.

Phases 1 and 2 of the Project shall pay the applicable FMSI fee to mitigate the Project's fair share of this cumulative impact.

Near-Term With-Project Phases 1 Through 3

The following cumulative impacts and the associated mitigations are based on Near-Term With-Project Phases 1 through 3 conditions. The Project shall mitigate its share of the cumulative impacts with payment of the City of Fresno TSMI and FMSI fees.

Impact NT3-1

Phases 1 through 3 of the Project contribute to a significant cumulative impact in the near-term condition based on intersection LOS criteria at the intersection of Fowler and Floradora Avenues. The cumulative projects will cause a substandard p.m. peak hour LOS E.

Mitigation NT3-1

The intersection of Fowler and Floradora (future McKinley) Avenues shall be widened in accordance with City of Fresno standards with two-way stop-control and the following minimum lane configurations:

Eastbound:	does not exist
Westbound:	one shared left-turn/right-turn lane
Northbound:	two through lanes with a shared right turn
Southbound:	one left-turn lane and two through lanes

With implementation of this mitigation the intersection will operate at LOS B during the a.m. peak hour and LOS C during the p.m. peak hour. This mitigation is potentially constrained by existing businesses and residences.

Phases 1 through 3 of the Project shall pay the applicable TSMI and FMSI fees to mitigate the Project's fair share of this cumulative impact.

Impact NT3-2

Phases 1 through 3 of the Project contribute to a significant cumulative impact in the near-term condition based on intersection LOS criteria at the intersection of Fowler and Olive Avenues. The cumulative projects will cause the a.m. peak hour LOS to drop from LOS E to LOS F and will exacerbate a substandard LOS F by more than 5.0 seconds during the p.m. peak hour.

Mitigation NT3-2

The intersection of Fowler and Olive Avenues shall be signalized in accordance with City of Fresno standards including protected left-turn phasing and the following minimum lane configurations:

Eastbound:	one left-turn lane and a shared through/right-turn lane
Westbound:	two left-turn lanes and a shared through/right-turn lane
Northbound:	one left-turn lane and two through lanes with a shared right turn
Southbound:	one left-turn lane and two through lanes with a shared right turn

With implementation of this mitigation the intersection will operate at LOS C and 95^{th}-percentile queues in the left-turn and right-turn lanes will be 196 feet or less. Therefore, standard City of Fresno turn lanes are recommended. This mitigation is potentially constrained by existing businesses and residences.

Phases 1 through 3 of the Project shall pay the applicable TSMI and FMSI fees to mitigate the Project's fair share of this cumulative impact. The construction of facilities as required in Mitigation E-1 that also satisfy the requirements of Mitigation NT3-2 shall be credited against the fees paid by Phase 3 of the Project.

Impact NT3-3

Phases 1 through 3 of the Project contribute to a significant cumulative impact in the near-term condition based on intersection LOS criteria at the intersection of Armstrong and Olive Avenues. The cumulative projects will cause a substandard a.m. peak hour LOS E.

Mitigation NT3-3

The intersection of Armstrong and Olive Avenues shall be signalized in accordance with City of Fresno standards including protected left-turn phasing and the following minimum lane configurations:

Eastbound:	one left-turn lane and a shared through/right-turn lane
Westbound:	one left-turn lane and a shared through/right-turn lane
Northbound:	one left-turn lane and a shared through/right-turn lane
Southbound:	one left-turn lane and a shared through/right-turn lane

With implementation of this mitigation the intersection will operate at LOS C during the a.m. peak hour and LOS B during the p.m. peak hour; 95^{th}-percentile queues in the left-turn and right-turn lanes will be 95 feet or less. Therefore, standard City of Fresno turn lanes are recommended.

Phases 1 through 3 of the Project shall pay the applicable TSMI and FMSI fees to mitigate the Project's fair share of this cumulative impact.

Impact NT3-4

Phases 1 through 3 of the Project contribute to a significant cumulative impact in the near-term condition based on road segment LOS criteria on Fowler Avenue between Olive and Floradora Avenues. The cumulative projects will cause the p.m. peak hour LOS to drop from LOS C to LOS E.

Mitigation NT3-4

This mitigation is identical to Mitigation NT2-2. Fowler Avenue between Olive and Floradora Avenues shall be widened to four lanes with a median per City of Fresno standards. In order to effectively utilize the additional lanes, the widening project shall extend south of Olive Avenue to match the existing four-lane section of Fowler Avenue. With implementation of this mitigation Fowler Avenue will operate at LOS B during the peak hours.

This mitigation is potentially constrained by existing businesses and residences.

Phases 1 through 3 of the Project shall pay the applicable FMSI fee to mitigate the Project's fair share of this cumulative impact.

Year 2035 With-Project (Without McKinley Avenue Realignment)

The following cumulative impacts and associated mitigations are based on the Long-Term With-Project conditions assuming that McKinley Avenue is not realigned to the Floradora Avenue alignment. The Project shall mitigate its fair share of the required mitigations with payment into the City of Fresno TSMI and FMSI fee programs. The cost of any facilities constructed in the ultimate location as a result of a near-term mitigation measure shall be credited against the required fees.

Impact 2035-1

The Project will contribute to a significant cumulative impact in the long-term condition based on intersection LOS criteria at the intersection of Fowler and Floradora Avenues. The Project will cause the a.m. peak hour LOS to drop from LOS E to LOS F and will exacerbate a substandard LOS F by more than 5.0 seconds during the p.m. peak hour.

Mitigation 2035-1

All-way stop control will not provide acceptable levels of service and the installation of traffic signals is not a feasible mitigation since peak-hour traffic signal warrants are not satisfied. The intersection of Fowler and Floradora Avenues shall be widened in accordance with City of Fresno standards with two-way stop-control and the following minimum lane configurations:

Eastbound:	one shared left-turn/right-turn lane
Westbound:	does not exist
Northbound:	two through lanes with a shared right turn
Southbound:	one left-turn lane and two through lanes

With implementation of this mitigation the westbound approach to the intersection will operate at LOS F during both peak hours and the impact will remain significant.

Phases 1 through 3 of the Project shall pay the applicable FMSI fee for road improvements to mitigate the Project's fair share of this cumulative impact.

Impact 2035-2

The Project will contribute to a significant cumulative impact in the long-term condition based on intersection LOS criteria at the intersection of Armstrong and Floradora Avenues. The Project will exacerbate a substandard LOS F by more than 5.0 seconds during the a.m. and p.m. peak hours.

Mitigation 2035-2

All-way stop control will not provide acceptable levels of service and the installation of traffic signals is not a feasible mitigation since peak-hour traffic signal warrants are not satisfied. The intersection of Armstrong and Floradora Avenues shall be widened in accordance with City of Fresno standards with two-way stop-control and the following minimum lane configurations:

Eastbound:	one shared left-turn/through/right-turn lane
Westbound:	one shared left-turn/through/right-turn lane
Northbound:	one left-turn lane and two through lanes with a shared right turn
Southbound:	one left-turn lane and two through lanes with a shared right turn

With implementation of this mitigation the eastbound and westbound approaches to the intersection will operate at LOS F during both peak hours and the impact will remain significant.

Phases 1 through 3 of the Project shall pay the applicable FMSI fee for road improvements to mitigate the Project's fair share of this cumulative impact.

Impact 2035-3

The Project will contribute to a significant cumulative impact in the long-term condition based on intersection LOS criteria at the intersection of Fowler and Olive Avenues. The Project will exacerbate a substandard LOS F by more than 5.0 seconds during the a.m. and p.m. peak hours.

Mitigation 2035-3

The intersection of Fowler and Olive Avenues shall be signalized in accordance with City of Fresno standards including protected left-turn phasing and the following minimum lane configurations:

Eastbound:	two left-turn lanes and two through lanes with a shared right turn
Westbound:	two left-turn lanes and two through lanes with a shared right turn
Northbound:	one left-turn lane, two through lanes, and one right-turn lane
Southbound:	one left-turn lane, two through lanes, and one right-turn lane

With implementation of this mitigation the intersection will operate at LOS C during both peak hours. With the exception of the westbound left-turn lanes, 95th-percentile queues in the left-turn lanes will be 227 feet or less and 95th-percentile queues in right-turn lanes will be 95 feet or less. The maximum calculated 95th-percentile queue in the westbound left-turn lanes is 319 feet. Therefore, standard City of Fresno turn lanes are recommended with the exception of the westbound dual left-turn lanes, which should provide a storage length of at least 325 feet. This mitigation is potentially constrained by existing businesses and residences.

Phases 1 through 3 of the Project shall pay the applicable TSMI and FMSI fees to mitigate the Project's fair share of this cumulative impact. The construction of facilities as required in Mitigation E-1 that also satisfy the requirements of Mitigation 2035-3 shall be credited against the fees paid by Phase 3 of the Project.

Impact 2035-4

The Project will contribute to a significant cumulative impact in the long-term condition based on intersection LOS criteria at the intersection of Armstrong and Olive Avenues. The Project will exacerbate a substandard LOS F by more than 5.0 seconds during the a.m. and p.m. peak hours.

Mitigation 2035-4

The intersection of Armstrong and Olive Avenues shall be signalized in accordance with City of Fresno standards including protected left-turn phasing and the following minimum lane configurations:

Eastbound:	one left-turn lane and two through lanes with a shared right turn
Westbound:	one left-turn lane and two through lanes with a shared right turn
Northbound:	one left-turn lane, two through lanes, and one right-turn lane
Southbound:	one left-turn lane, two through lanes, and one right-turn lane

With implementation of this mitigation the intersection will operate at LOS C during both peak hours. With the exception of the eastbound left-turn lane, 95th-percentile queues in the left-turn lanes will be 201 feet or less and 95th-percentile queues in right-turn lanes will be 92 feet or less. The maximum calculated 95th-percentile queue in the eastbound left-turn lane is 308 feet. Therefore, standard City of Fresno turn lanes are recommended with the exception of the westbound left-turn lane, which should provide a storage length of at least 308 feet.

Phases 1 through 3 of the Project shall pay the applicable TSMI and FMSI fees to mitigate the Project's fair share of this cumulative impact.

Impact 2035-5

The Project will contribute to a significant cumulative impact in the long-term condition based on intersection LOS criteria on Fowler Avenue between Olive and Floradora Avenues. Regional growth, including the proposed Project, will cause the a.m. peak hour LOS to drop from LOS B to LOS E and will cause the p.m. peak hour LOS to drop from LOS C to LOS E.

Mitigation 2035-5

Fowler Avenue between Olive and Floradora Avenues shall be widened to four lanes in accordance with City of Fresno standards. With implementation of this mitigation the road segment will operate at LOS D during both peak hours. This configuration will conform to the City of Fresno General Plan and City of Fresno standards for a four-lane arterial. Phases 1 through 3 of the Project shall pay the applicable FMSI fees to mitigate the Project's fair share of this cumulative impact.

Impact 2035-6

The Project will contribute to a significant cumulative impact in the long-term condition based on intersection LOS criteria on Armstrong Avenue between Olive and Floradora Avenues. Regional growth, including the proposed Project, will cause the LOS to drop from LOS B to LOS E during the a.m. and p.m. peak hours.

Mitigation 2035-6

Armstrong Avenue between Olive and Floradora Avenues shall be widened to four lanes in accordance with City of Fresno standards. With implementation of this mitigation the road segment will operate at LOS C during both peak hours. This configuration will conform to the City of Fresno General Plan and City of Fresno standards for a four-lane collector. Phases 1 through 3 of the Project shall pay the applicable FMSI fees to mitigate the Project's fair share of this cumulative impact.

Impact 2035-7

The Project will contribute to a significant cumulative impact in the long-term condition based on intersection LOS criteria on Olive Avenue between Fowler and Armstrong Avenues. Regional growth, including the proposed Project, will cause the LOS to drop from LOS C to LOS F during the a.m. and p.m. peak hours.

Mitigation 2035-7

Olive Avenue between Fowler and Armstrong Avenues shall be widened to four lanes in accordance with City of Fresno standards. With implementation of this mitigation the road segment will operate at LOS C during both peak hours. This configuration will conform to the City of Fresno General Plan and City of Fresno standards for a four-lane collector. Phases 1 through 3 of the Project shall pay the applicable FMSI fees to mitigate the Project's fair share of this cumulative impact.

Year 2035 With-Project (With McKinley Avenue Realignment)

The following cumulative impacts and associated mitigations are based on Long-Term With-Project conditions assuming that McKinley Avenue is realigned to the Floradora Avenue alignment. The Project shall mitigate its fair share of the required mitigations with payment into the City of Fresno TSMI and FMSI fee programs. The cost of any facilities constructed in the ultimate location as a result of a near-term mitigation measure shall be credited against the required fees.

Impact 2035-1A (McKinley Avenue realigned)

The Project will contribute to a significant cumulative impact in the long-term condition based on intersection LOS criteria at the intersection of Fowler and Floradora (McKinley) Avenues. The Project will exacerbate a substandard LOS F by more than 5.0 seconds during the a.m. and p.m. peak hours.

Mitigation 2035-1A (McKinley Avenue realigned)

The intersection of Fowler and Floradora (McKinley) Avenues shall be signalized in accordance with City of Fresno standards including protected left-turn phasing and the following minimum lane configurations:

Eastbound:	one left-turn lane, one through lane, and one right-turn lane
Westbound:	two left-turn lanes, one through lane, and one right-turn lane
Northbound:	two left-turn lanes, two through lanes, and one right-turn lane
Southbound:	one left-turn lane, two through lanes, and one right-turn lane

With implementation of this mitigation the intersection will operate at LOS C during both peak hours. The 95^{th}-percentile queues in the left-turn and right-turn lanes will be 164 feet or less. Therefore, standard City of Fresno turn lanes are recommended.

Phases 1 through 3 of the Project shall pay the applicable TSMI and FMSI fees to mitigate the Project's fair share of this cumulative impact.

Impact 2035-2A (McKinley Avenue realigned)

The Project will contribute to a significant cumulative impact in the long-term condition based on intersection LOS criteria at the intersection of Armstrong and Floradora (McKinley) Avenues. The Project will exacerbate a substandard LOS F by more than 5.0 seconds during the a.m. and p.m. peak hours.

Mitigation 2035-2A (McKinley Avenue realigned)

The intersection of Armstrong and Floradora (McKinley) Avenues shall be signalized in accordance with City of Fresno standards including protected left-turn phasing and the following minimum lane configurations:

Eastbound:	one left-turn lane, one through lane, and one right-turn lane
Westbound:	one left-turn lane, one through lane, and one right-turn lane
Northbound:	one left-turn lane and two through lanes with a shared right turn
Southbound:	one left-turn lane and two through lanes with a shared right turn

With implementation of this mitigation the intersection will operate at LOS C during the a.m. peak hour and LOS D during the p.m. peak hour. The 95^{th}-percentile queues in the left-turn and right-turn lanes will be 203 feet or less. Therefore, standard City of Fresno turn lanes are recommended.

Phases 1 through 3 of the Project shall pay the applicable TSMI and FMSI fees to mitigate the Project's fair share of this cumulative impact.

Impact 2035-3A (McKinley Avenue realigned)

The Project will contribute to a significant cumulative impact in the long-term condition based on intersection LOS criteria at the intersection of Fowler and Olive Avenues. The Project will exacerbate a substandard LOS F by more than 5.0 seconds during the a.m. and p.m. peak hours.

Mitigation 2035-3A (McKinley Avenue realigned)

The intersection of Fowler and Olive Avenues shall be signalized in accordance with City of Fresno standards including protected left-turn phasing and the following minimum lane configurations:

Eastbound:	two left-turn lanes and two through lanes with a shared right turn
Westbound:	two left-turn lanes and two through lanes with a shared right turn
Northbound:	one left-turn lane, two through lanes, and one right-turn lane
Southbound:	one left-turn lane, two through lanes, and one right-turn lane

With implementation of this mitigation the intersection will operate at LOS C during both peak hours. With the exception of the westbound left-turn lanes, 95^{th}-percentile queues in the left-turn lanes will be 214 feet or less and 95^{th}-percentile queues in right-turn lanes will be 95 feet or less. The maximum calculated 95^{th}-percentile queue in the westbound left-turn lanes is 319 feet. Therefore, standard City of Fresno turn lanes are recommended with the exception of the westbound dual left-turn lanes, which should provide a storage length of at least 319 feet. This mitigation is potentially constrained by existing businesses and residences.

Phases 1 through 3 of the Project shall pay the applicable TSMI and FMSI fees to mitigate the Project's fair share of this cumulative impact. The construction of facilities as required in Mitigation E-1 that also satisfy the requirements of Mitigation 2035-3A shall be credited against the fees paid by Phase 3 of the Project.

Impact 2035-4A (McKinley Avenue realigned)

The Project will contribute to a significant cumulative impact in the long-term condition based on intersection LOS criteria at the intersection of Armstrong and Olive Avenues. The Project will exacerbate a substandard LOS F by more than 5.0 seconds during the a.m. and p.m. peak hours.

Mitigation 2035-4A (McKinley Avenue realigned)

The intersection of Armstrong and Olive Avenues shall be signalized in accordance with City of Fresno standards including protected left-turn phasing and the following minimum lane configurations:

Eastbound:	one left-turn lane and two through lanes with a shared right turn
Westbound:	one left-turn lane and two through lanes with a shared right turn
Northbound:	one left-turn lane, two through lanes, and one right-turn lane
Southbound:	one left-turn lane, two through lanes, and one right-turn lane

With implementation of this mitigation the intersection will operate at LOS C during both peak hours. With the exception of the eastbound left-turn lane, 95^{th}-percentile queues in the left-turn lanes will be 187 feet or less and 95^{th}-percentile queues in right-turn lanes will be 89 feet or less. The maximum calculated 95^{th}-percentile queue in the eastbound left-turn lane is 319 feet. Therefore, standard City of Fresno turn lanes are recommended with the exception of the eastbound left-turn lane, which should provide a storage length of at least 319 feet.

Phases 1 through 3 of the Project shall pay the applicable TSMI and FMSI fees to mitigate the Project's fair share of this cumulative impact.

Impact 2035-5A (McKinley Avenue realigned)

The Project will contribute to a significant cumulative impact in the long-term condition based on intersection LOS criteria on Fowler Avenue between Olive and Floradora Avenues. Regional growth, including the proposed Project, will cause the a.m. peak hour LOS to drop from LOS B to LOS E and will cause the p.m. peak hour LOS to drop from LOS C to LOS E.

Mitigation 2035-5A (McKinley Avenue realigned)

Fowler Avenue between Olive and Floradora Avenues shall be widened to four lanes in accordance with City of Fresno standards. With implementation of this mitigation the road segment will operate at LOS D during both peak hours. This configuration will conform to the City of Fresno General Plan and City of Fresno standards for a four-lane arterial. Phases 1 through 3 of the Project shall pay the applicable FMSI fees to mitigate the Project's fair share of this cumulative impact.

Impact 2035-6A (McKinley Avenue realigned)

The Project will contribute to a significant cumulative impact in the long-term condition based on intersection LOS criteria on Armstrong Avenue between Olive and Floradora Avenues. Regional growth, including the proposed Project, will cause the LOS to drop from LOS B to LOS E during the a.m. and p.m. peak hours.

Mitigation 2035-6A (McKinley Avenue realigned)

Armstrong Avenue between Olive and Floradora Avenues shall be widened to four lanes in accordance with City of Fresno standards. With implementation of this mitigation the road segment will operate at LOS C during both peak hours. This configuration will conform to the City of Fresno General Plan and City of Fresno standards for a four-lane collector. Phases 1 through 3 of the Project shall pay the applicable FMSI fees to mitigate the Project's fair share of this cumulative impact.

Impact 2035-7A (McKinley Avenue realigned)

The Project will contribute to a significant cumulative impact in the long-term condition based on intersection LOS criteria on Olive Avenue between Fowler and Armstrong Avenues. Regional growth, including the proposed Project, will cause the LOS to drop from LOS C to LOS F during the a.m. and p.m. peak hours.

Mitigation 2035-7A (McKinley Avenue realigned)

Olive Avenue between Fowler and Armstrong Avenues shall be widened to four lanes in accordance with City of Fresno standards. With implementation of this mitigation the road segment will operate at LOS C during both peak hours. This configuration will conform to the City of Fresno General Plan and City of Fresno standards for a four-lane collector. Phases 1 through 3 of the Project shall pay the applicable FMSI fees to mitigate the Project's fair share of this cumulative impact.

Impact and Mitigation Summary

Location	Impact	Mitigation		
		Phase 1	Phase 2	Phase 3
Fowler / Floradora	NT3-1	TSMI and FMSI Fees	TSMI and FMSI Fees	TSMI and FMSI Fees
	2035-1	FMSI Fee	FMSI Fee	FMSI Fee
	2035-1A	TSMI and FMSI Fees	TSMI and FMSI Fees	TSMI and FMSI Fees
Armstrong / Floradora	2035-2	FMSI Fee	FMSI Fee	FMSI Fee
	2035-2A	TSMI and FMSI Fees	TSMI and FMSI Fees	TSMI and FMSI Fees
Fowler / Olive	E-1	None	None	Construct traffic signals and intersection widening (Potentially constrained)
	NT2-1	TSMI and FMSI Fees	TSMI and FMSI Fees	None
	NT3-2	TSMI and FMSI Fees	TSMI and FMSI Fees	TSMI and FMSI Fees
	2035-3	TSMI and FMSI Fees	TSMI and FMSI Fees	TSMI and FMSI Fees
	2035-3A	TSMI and FMSI Fees	TSMI and FMSI Fees	TSMI and FMSI Fees
Armstrong / Olive	NT3-3	TSMI and FMSI Fees	TSMI and FMSI Fees	TSMI and FMSI Fees
	2035-4	TSMI and FMSI Fees	TSMI and FMSI Fees	TSMI and FMSI Fees
	2035-4A	TSMI and FMSI Fees	TSMI and FMSI Fees	TSMI and FMSI Fees
Site Access / Floradora	None	None	None	None
Site Access / Olive	None	None	None	None
Fowler Avenue: Olive to Floradora	NT2-2	FMSI Fee	FMSI Fee	None
	NT3-4	FMSI Fee	FMSI Fee	FMSI Fee
	2035-5	FMSI Fee	FMSI Fee	FMSI Fee
	2035-5A	FMSI Fee	FMSI Fee	FMSI Fee
Armstrong Avenue: Olive to Floradora	2035-6	FMSI Fee	FMSI Fee	FMSI Fee
	2035-6A	FMSI Fee	FMSI Fee	FMSI Fee
Olive Avenue: Fowler to Armstrong	2035-7	FMSI Fee	FMSI Fee	FMSI Fee
	2035-7A	FMSI Fee	FMSI Fee	FMSI Fee
Floradora Avenue: Fowler to Armstrong	None	None	None	None

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1.0 INTRODUCTION

This traffic impact study has been prepared to study the potential traffic impacts related to the proposed City of Fresno Southeast Surface Water Treatment Facility (SWTF) in Fresno California, hereinafter referred to as the "Project." The traffic impact study will be utilized in the preparation of an environmental impact report (EIR) for the Project.

1.1 Purpose

The traffic impact study was prepared to investigate potential traffic impacts resulting from the Project in both the near-term and long-term cumulative (year 2035) conditions. The analysis focuses on the anticipated effect of vehicle traffic on study area intersections and roadway segments. Additional discussions are included related to transit facilities, bicycle facilities, pedestrian facilities, and regional transportation concepts.

1.2 Project Description

The Project site location is presented in the attached Figure 1-1, Vicinity Map, and the Project site plan is presented in the attached Figure 1-2, Site Plan.

The Project will be located on approximately 58 acres bounded by Olive Avenue on the south, Armstrong Avenue on the east, Floradora Avenue on the north, and existing parcels to the west. The facility is proposed to ultimately include a new water treatment plant and operations center capable of treating 80 million gallons per day (mgd), new City of Fresno Water Division corporation yard, and Water Division administrative offices at the site. The project may also include an education center and demonstration garden. Site access will be provided via driveways connecting to Floradora and Olive Avenues.

The project is envisioned to be developed in three phases as follows:

- Phase 1: 40 mgd SWTF and operations building
- Phase 2: 40 mgd expansion of existing SWTF (resulting total of 80 mgd)
- Phase 3: Water Division corporation yard and administrative offices

1.3 Study Area and Time Period

The study intersections and road segments were determined based on the anticipated volume and distribution of Project traffic. A scoping letter dated March 29, 2012 was provided to local agencies and the scope of the study was finalized based on the responses received. The scoping letter and responses are presented in Appendix A. This report includes analysis of the following intersections:

1. Fowler and Floradora Avenues
2. Armstrong and Floradora Avenues
3. Fowler and Olive Avenues
4. Armstrong and Olive Avenues
5. Floradora Avenue and Site Access
6. Olive Avenue and Site Access

This report also includes analysis of the following road segments:

1. Fowler Avenue between Floradora and Olive Avenues
2. Armstrong Avenue between Floradora and Olive Avenues
3. Floradora Avenue between Fowler and Armstrong Avenues
4. Olive Avenue between Fowler and Armstrong Avenues

The California Public Utilities Commission (CPUC) requested that the existing at-grade railroad crossing on Olive Avenue immediately east of Clovis Avenue be considered in the analyses.

The locations of the study intersections and road segments are presented in Figure 1-3, Study Intersections and Road Segments.

1.4 Study Scenarios

The analyses were performed in general conformance with the City of Fresno *Traffic Impact Study Report Guidelines* dated January 20, 2009 and the Caltrans *Guide for the Preparation of Traffic Impact Studies* dated December 2002. The study time periods include the weekday a.m. peak hour determined between 7:00 and 9:00 a.m. and the weekday p.m. peak hour determined between 4:00 and 6:00 p.m.

The peak hours were analyzed for the following scenarios:

Baseline Conditions

- Existing Conditions;

No-Project Conditions (for informational purposes only)

- Long-Term (Year 2035) No-Project Conditions;
- Long-Term (Year 2035) No-Project Conditions (with McKinley Avenue realignment).

Project Conditions

- Existing Plus Phases 1 and 2 Project Conditions;
- Existing Plus Phases 1 through 3 Project Conditions;
- Near-Term With Phases 1 and 2 Project Conditions (includes approved and pending projects);
- Near-Term With Phases 1 through 3 Project Conditions (includes approved and pending projects);
- Year 2035 With Phases 1 through 3 Project Conditions;
- Year 2035 With Phases 1 through 3 Project Conditions (with McKinley realignment).

1.5 List of Abbreviations

The following is a list of abbreviations that may be used the text of this report.

NB – Northbound
EB – Eastbound
NBL – Northbound left
NBR – Northbound right
SBL – Southbound left
SBR – Southbound right
EBL – Eastbound left
EBR – Eastbound right
WBL – Westbound left
WBR – Westbound right
SR – State Route
TGH – Trip Generation Handbook
ITE – Institute of Transportation Engineers
Int – Interchange
FAR – Floor Area Ratio
sq. ft. – square feet
ft - foot or feet
COG – Fresno Council of Governments
CMUTCD – California Manual on Uniform Traffic Control Devices
SB – Southbound
WB – Westbound
LOS – Level of service
OWS – One-way stop control
TWS – Two-way stop control
AWS – All-way stop control
HCM – Highway Capacity Manual
PHF – Peak Hour Factor
sec – seconds
TWLTL – Two-way left-turn lane
SOI – Sphere of Influence
TAZ – Traffic Analysis Zone
n/r – Analysis not required
U – Undivided
DU – dwelling units
DNE – Does not exist

2.0 IMPACT SIGNIFICANCE CRITERIA

2.1 Level of Service

The Transportation Research Board *Highway Capacity Manual*, 2010, (HCM) defines level of service (LOS) as, "A quantitative stratification of a performance measure or measures that represent quality of service, measured on an A-F scale, with LOS A representing the best operating conditions from the traveler's perspective and LOS F the worst."

Automobile mode LOS characteristics for both unsignalized and signalized intersections are presented in Tables 2.1 and 2.2. Automobile mode LOS characteristics for uninterrupted flow two-lane highways are presented in Table 2.3.

Table 2.1
Level of Service Characteristics for Unsignalized Intersections

Level of Service	Average Vehicle Delay (seconds)
A	0-10
B	>10-15
C	>15-25
D	>25-35
E	>35-50
F	>50

Reference: *Highway Capacity Manual,* Transportation Research Board, 2010

Table 2.2
Level of Service Characteristics for Signalized Intersections

Level of Service	Description	Average Vehicle Delay (seconds)
A	Volume-to-capacity ratio is low. Progression is exceptionally favorable or the cycle length is very short.	<10
B	Volume-to-capacity ratio is low. Progression is highly favorable or the cycle length is very short.	>10-20
C	Volume-to-capacity ratio is no greater than 1.0. Progression is favorable or cycle length is moderate.	>20-35
D	Volume-to-capacity ratio is high but no greater than 1.0. Progression is ineffective or cycle length is long. Many vehicles stop and individual cycle failures are noticeable.	>35-55
E	Volume-to-capacity ratio is high but no greater than 1.0. Progression is unfavorable and cycle length is long. Individual cycle failures are frequent.	>55-80
F	Volume-to-capacity ratio is greater than 1.0. Progression is very poor and cycle length is long. Most cycles fail to clear the queue.	>80

Reference: *Highway Capacity Manual*, Transportation Research Board, 2010

Table 2.3
Level of Service Characteristics for Road Segments

Level of Service	Description
A	High operating speeds with a small amount of platooning.
B	Speed reductions are present and platooning is noticeable.
C	Most vehicles traveling in platoons with speeds noticeably curtailed.
D	Platooning increases significantly.
E	Demand approaching capacity. Speeds seriously curtailed.
F	Demand exceeds capacity and heavy congestion exists.

Reference: *Highway Capacity Manual*, Transportation Research Board, 2010

The City of Fresno requires that LOS D or better be maintained to comply with the *2025 General Plan, Transportation/Streets and Highways, Policy E-1-f*. The City of Fresno recognizes a traffic impact if a project will decrease the LOS below D at an intersection or road segment. The City of Fresno also recognizes a traffic impact if a project will exacerbate an intersection already operating at a substandard LOS by increasing the average delay at the intersection by 5.0 seconds or more, or by causing the LOS to drop from E to F. Finally, the City of Fresno recognizes a traffic impact if a project will exacerbate a road segment already operating at substandard LOS by increasing the volume-to-capacity ratio (v/c) of the road segment by 0.15 or more, or by causing the LOS to drop from E to F.

2.2 Intersection Queuing Criteria

The City of Fresno *Traffic Impact Study Report Guidelines* dated January 20, 2009 requires a queuing analysis of the study intersections and recommendations for queues that are projected to exceed the available storage capacity. However, it should be noted that queuing is not included in the significance criteria recognized by the City and is reviewed to confirm the LOS results.

A queuing deficiency is identified in the no-project condition if the calculated 95^{th}-percentile queue length exceeds the storage length by more than 25 feet (the average storage length for one additional vehicle) since the bay taper can typically store at least one vehicle. A significant queuing impact is determined if the project causes the calculated 95^{th}-percentile queue length to exceed the storage capacity of a left-turn lane at a signalized intersection by more than 25 feet. In storage lanes that are already deficient without the project, a significant queuing impact is determined if the project increases the calculated 95^{th}-percentile queue length by at least 25 feet.

2.3 Transit, Bicycle, and Pedestrian Facilities

A significant impact is determined if a project would disrupt or impede existing or planned transit, bicycle, or pedestrian facilities.

3.0 TRAFFIC ANALYSIS METHODOLOGY

This section describes the methods and criteria used to evaluate LOS and traffic signal warrants.

3.1 Intersection Analysis Methodology

The levels of service and 95th-percentile queues at the study intersections were determined using the computer program Synchro 8, which is based on the HCM procedures for calculating levels of service. Queue lengths are reported only for signalized intersections to reveal possible deficiencies that would not be apparent based only on LOS results. For example, if a left-turn lane is not long enough to contain the queues, then the vehicles waiting to turn left will back up into the through traffic lanes and potentially block through traffic while the through traffic signal phase is being served with green time. This type of deficiency would not be apparent based on LOS calculations alone for signalized intersections. On the other hand, at stop-sign-controlled intersections a queuing analysis would not reveal any additional deficiencies that are not already revealed in the LOS analysis. Therefore, queuing analyses are not presented for unsignalized intersections.

For signalized intersections and all-way-stop-controlled intersections, the overall intersection LOS and the average delay per vehicle are presented. For one-way and two-way stop-controlled intersections, an overall intersection LOS is not defined in the HCM. Therefore, for one-way and two-way stop-controlled intersections the LOS and average delay per vehicle for the movement with the greatest delay is reported.

Although peak-hour traffic volumes are typically utilized in the operational analysis of intersections, the HCM actually utilizes the peak 15-minute period as the basis for operational analyses by incorporating the peak hour factor (PHF) into the analyses. The PHF is the relationship between peak-hour volumes and peak 15-minute volumes calculated by dividing the peak-hour volume by four times the peak 15-minute volume. PHFs for the existing-conditions, existing-plus-Project conditions, and near-term conditions analyses were determined based on the existing traffic volumes. The HCM suggests that a PHF of 0.92 in urban areas and 0.88 in rural areas may be used in the absence of field data. For purposes of the cumulative year 2035 analyses performed for this study, in which field data is not available and traffic volumes are projected, a PHF of 0.92 is used (unless the existing PHF exceeds 0.92, in which case the existing PHF is used).

3.2 Traffic Signal Warrants

The California Department of Transportation *California Manual on Uniform Traffic Control Devices, 2012 Edition* (CMUTCD) presents various warrant analyses to assist in evaluating the need for traffic signals at an intersection. Traffic signal warrants are a series of criteria that provide guidance for determining if the installation of traffic signals is appropriate at a given intersection. If one or more of the signal warrants are met, signalization of the intersection may be appropriate. However, a signal likely should not be installed if none or few of the warrants are met since the installation of signals may increase delays on the previously uncontrolled major street and may contribute to an increase in accidents.

The potential need for a traffic signal was evaluated at each unsignalized intersection operating at substandard levels of service. The analyses presented herein are based on peak hour traffic volumes using Figure 4C-4, Warrant 3, Peak Hour (70% Factor) as presented in the CMUTCD to evaluate the possibility that traffic signals may be warranted at study intersections not currently signalized. Traffic signals are not considered to be a feasible mitigation if traffic signal warrants are not met.

Other traffic signal warrants, such as Warrant 1 (eight-hour warrant) and Warrant 2 (four-hour warrant) are not typically utilized in traffic impact studies because it is not practical or feasible to project the hourly fluctuation of traffic volumes in the future. The Fresno County Travel Model does not include enough information to project hourly volumes of an eight-hour period.

3.3 Road Segment Analysis Methodology

Road segment analyses were based on the Florida Department of Transportation (FDOT) Generalized Q/LOS Tables. The Florida road segment tables were developed based on procedures outlined in the HCM and are commonly utilized in the San Joaquin Valley for road segment analyses. The Florida tables are specified in the City of Fresno *Traffic Impact Study Report Guidelines* dated February 2, 2009 as an acceptable method for analysis of road segments in the City of Fresno.

The Florida tables present LOS criteria based on the type of roadway being analyzed and the regional setting (i.e., urban areas or transitioning areas). The appropriate Florida table is dependent upon the setting. For the impact analyses, Table 5, Generalized Peak Hour Two-Way Volumes for Florida's Areas Transitioning into Urbanized Areas OR Areas Over 5,000 Not in Urbanized Areas (Major City/County Roadways) was utilized. For General Plan build out conditions, including mitigated year 2035 conditions, Table 4, Generalized Peak Hour Two-Way Volumes for Florida's Urbanized Areas (Major City/County Roadways) was utilized in the analysis. These tables are attached in Appendix B. Tables 3.1 through 3.3 present the specific volume thresholds used in the analyses. It should be noted that, for interrupted flow facilities, stop-sign-controlled intersections fall under the designation of a "signalized intersection" when using the Florida tables (Section 3.7 of the *2009 FDOT Quality/Level of Service Handbook*).

Table 3.1
Volume Thresholds for Non-State Major City /County Roadway Levels of Service
Transitioning Areas - Class I (>0.00 to 1.99 signalized intersections per mile)

Lanes	Median	A	B	C	D	E	F
2	Undivided	-	≤774	775 – 1,233	1,234 – 1,332	≥1,334	***
2	Divided with left-turn lanes, no right-turn lanes	-	≤813	814 – 1,295	1,296 – 1,399	≥1,400	***
2	Divided with left-turn lanes and right-turn lanes	-	≤853	854 – 1,359	1,360 – 1,469	≥1,470	***
4	Undivided with left-turn lanes, no right-turn lanes	-	≤2,223	2,224 – 2,659	2,660 – 2,804	≥2,805	***
4	Undivided no turn lanes	-	≤1,755	1,756 – 2,099	2,100 – 2,214	≥2,215	***
4	Divided with left-turn lanes, no right-turn lanes	-	≤2,340	2,341 – 2,799	2,800 – 2,952	≥2,953	***
4	Divided with left-turn lanes and right-turn lanes	-	≤2,457	2,458 – 2,938	2,939 – 3,099	≥3,100	***
6	Divided with left-turn lanes, no right-turn lanes	-	≤3,618	3,619 – 4,239	4,240 – 4,455	≥4,456	***
6	Divided with left-turn lanes and right-turn lanes	-	≤3,798	3,799 – 4,450	4,451 – 4,677	≥4,678	***

Reference: Florida Department of Transportation Table 5, Generalized Peak Hour Two-Way Volumes for Florida's Areas Transitioning into Urbanized Areas OR Areas Over 5,000 Not in Urbanized Areas (utilizing Major City/County Roadways adjustments)

Table 3.2
Volume Thresholds for Non-State Major City /County Roadway Levels of Service
Transitioning Areas - Class II (2.00 to 4.50 signalized intersections per mile)

Lanes	Median	A	B	C	D	E	F
2	Undivided	-	≤818	819 – 1,196	1,197 – 1,277	≥1,278	***
2	Divided with left-turn lanes, no right-turn lanes	-	≤859	860 – 1,256	1,257 – 1,341	≥1,342	***
2	Divided with left-turn lanes and right-turn lanes	-	≤902	903 – 1,319	1,320 – 1,408	≥1,409	***
4	Undivided with left-turn lanes, no right-turn lanes	-	≤1,880	1,881 – 2,487	2,488 – 2,632	≥2,633	***
4	Undivided no turn lanes	-	≤1,484	1,485 – 1,963	1,964 – 2,078	≥2,079	***
4	Divided with left-turn lanes, no right-turn lanes	-	≤1,979	1,980 – 2,618	2,619 – 2,771	≥2,772	***
4	Divided with left-turn lanes and right-turn lanes	-	≤2,078	2,079 – 2,748	2,749 – 2,909	≥2,910	***
6	Divided with left-turn lanes, no right-turn lanes	-	≤3,113	3,114 – 3,959	3,960 – 4,175	≥4,176	***
6	Divided with left-turn lanes and right-turn lanes	-	≤3,268	3,269 – 4,157	4,158 – 4,383	≥4,384	***

Reference: Florida Department of Transportation Table 5, Generalized Peak Hour Two-Way Volumes for Florida's Areas Transitioning into Urbanized Areas OR Areas Over 5,000 Not in Urbanized Areas (utilizing Major City/County Roadways adjustments)

Table 3.3
Volume Thresholds for Non-State Major City /County Roadway Levels of Service
Urbanized Areas - Class II (2.00 to 4.50 signalized intersections per mile)

Lanes	Median	A	B	C	D	E	F
2	Undivided	-	-	≤918	919 – 1,332	1,333 – 1,413	≥1,414
4	Undivided with left-turn lanes, no right-turn lanes	-	-	≤2,069	2,070 – 2,753	2,754 – 2,907	≥2,908
4	Undivided no turn lanes	-	-	≤1,634	1,635 – 2,174	2,175 – 2,295	≥2,296
4	Divided with left-turn lanes, no right-turn lanes	-	-	≤2,178	2,179 – 2,898	2,899 – 3,060	≥3,061
4	Divided with left-turn lanes and right-turn lanes	-	-	≤2,286	2,287 – 3,042	3,043 – 3,213	≥3,214
6	Divided with left-turn lanes, no right-turn lanes	-	-	≤3,411	3,412 – 4,392	4,393 – 4,635	≥4,636
6	Divided with left-turn lanes and right-turn lanes	-	-	≤3,581	3,582 – 4,611	4,612 – 4,866	≥4,867

Reference: Florida Department of Transportation Table 4, Generalized Peak Hour Two-Way Volumes for Florida's Urbanized Areas (utilizing Major City/County Roadways adjustments)

4.0 EXISTING CONDITIONS

4.1 Existing Roadway Network

The Project study area includes four existing intersections and four existing road segments. The Project location, study intersections, and study road segments are illustrated in Figure 1-3, Study Intersections and Road Segments. The existing lane configurations and intersection control at the study intersections are illustrated in Figure 4-1, Existing Lane Configurations and Intersection Control. A description of the major roadways near the Project site is presented below.

Fowler Avenue is under the jurisdiction of the County of Fresno in the vicinity of the Project but is within the City of Fresno sphere of influence (SOI). Fowler Avenue is a north-south roadway extending from the County line near Laton, California at its southern end to the City of Clovis and beyond to the north, with a discontinuous section in Fowler, California. In the vicinity of the Project site, Fowler Avenue consists of one 11- to 12-foot-wide lane in each direction with a posted speed limit of 45 miles per hour. The 2025 Fresno General Plan designates Fowler Avenue as an arterial (four lanes with a median). Traffic counts performed for this study indicated a weekday 24-hour volume of 12,261 vehicles on Fowler Avenue between Olive and Floradora Avenues.

Armstrong Avenue is under the jurisdiction of the County of Fresno in the vicinity of the Project but is within the City of Fresno sphere of influence (SOI). Armstrong Avenue is a north-south roadway extending from Fancher Creek at the southern end through the City of Clovis to Teague Avenue at its northern end. In the vicinity of the Project site, Armstrong Avenue consists of one 10- to 11-foot-wide lane in each direction. The only speed limit signs observed in the vicinity of the Project site are 25-miles-per-hour school speed limits when children are present adjacent to Temperance Kutner Elementary School. The 2025 Fresno General Plan designates Armstrong Avenue as a collector (typically one lane in each direction with a two-way left-turn lane down the center). Traffic counts performed for this study indicated a weekday 24-hour volume of 3,079 on Armstrong Avenue between Olive and Floradora Avenues.

Olive Avenue is under the jurisdiction of the County of Fresno in the vicinity of the Project but is within the City of Fresno sphere of influence (SOI). Olive Avenue is an east-west roadway extending from Garfield Avenue at its western end through the City of Fresno to Fancher Avenue at its eastern end. In the vicinity of the Project site, Olive Avenue consists of one 12-foot-wide lane in each direction with a posted speed limit of 45 miles per hour. A 25-miles-per-hour school speed limit exists when children are present adjacent to Temperance Kutner Elementary School. The 2025 Fresno General Plan designates Olive Avenue as a collector (typically one lane in each direction with a two-way left-turn lane down the center). Traffic counts performed for this study indicated a weekday 24-hour volume of 4,969 on Olive Avenue between Fowler and Armstrong Avenues.

Floradora Avenue is under the jurisdiction of the County of Fresno in the vicinity of the Project but is within the City of Fresno sphere of influence (SOI). In the vicinity of the Project site, Floradora Avenue is an east-west roadway extending from Fowler Avenue at its western end to Temperance Avenue at its eastern end. This segment of Floradora Avenue consists of one 10- to 11-foot-wide lane in each direction. There are no posted speed limits.

Traffic counts performed for this study indicated a weekday 24-hour volume of 160 on Floradora Avenue between Fowler and Armstrong Avenues.

The 2025 Fresno General Plan does not designate Floradora Avenue as a major street and it is therefore considered a local road. However, plan lines have been developed by the City of Fresno that may result in the McKinley Avenue being extended east of Clovis Avenue and curving down to overlap the segment of Floradora Avenue between Fowler Avenue and Armstrong Avenue. Although McKinley Avenue is designated as an arterial street (four lanes with a median), the plan lines call out a collector configuration (typically one lane in each direction with a two-way left-turn lane down the center).

4.2 Existing Transit Service

Fresno Area Express (FAX) provides local bus service within Fresno. FAX operates fixed bus routes, the nearest of which is Route 35 through the intersection of Clovis and Olive Avenues.

4.3 Existing Bicycle Facilities

The 2010 City of Fresno Bicycle, Pedestrian and Trails Master Plan (BMP) classifies bicycle facilities as follows:

- Class I – Off-Street Path: Dedicated and paved pathway right-of-way separated from vehicle traffic
- Class II – On-Street Lanes: Bicycle facilities share street and include pavement markings and signage.
- Class III – On-Street Route: Bicycle facilities share street and include signage only.

There are no existing bicycle facilities at the study locations.

The BMP contemplates future Class II bicycle facilities along Olive Avenue, Fowler Avenue, and Armstrong Avenue. The BMP contemplates a future Class I facility along the existing canal on the McKinley Avenue alignment. It is anticipated that realignment of McKinley Avenue to the Floradora Avenue alignment in the vicinity of the Project site would include construction of Class II bicycle facilities.

4.4 Existing Pedestrian Facilities

Pedestrian pathways or sidewalks do not exist along the frontage of the Project site or in the vicinity of the Project site, with the exception of existing sidewalks along the Armstrong Avenue frontage of Temperance Kutner Elementary School. One yellow crosswalk exists on the east leg of the intersection of Armstrong and Olive Avenues.

City of Fresno standards call for pedestrian facilities along all major streets and crosswalks at all intersections.

4.5 Existing At-Grade Railroad Crossing

An at-grade railroad crossing (San Joaquin Valley Railroad) exists on Olive Avenue immediately east of Clovis Avenue (approximately one mile west of the Project site). The railroad spur runs north and south, parallel to Clovis Avenue, connecting to the main line at McKinley Avenue with a dead end approximately ¼ mile south of Olive Avenue (immediately north of the State Route 180 freeway).

The crossing has one set of railroad tracks. Olive Avenue has two lanes of travel in each direction plus a left-turn lane crossing over the tracks. The lanes are approximately 10 to 12 feet in width and there are no shoulders and no pedestrian facilities crossing the tracks. The crossing is equipped with cantilevered flashing light signals, pole-mounted flashing lights, crossbucks, and bells. Automatic gates do not exist.

Data available on the Federal Railroad Administration (FRA) web site (www.fra.dot.gov) indicate that approximately four switching trains occur at the crossing per day with speeds between 10 and 20 miles per hour. The actual speed is limited by the fact that the rail ends ¼ mile south of the crossing. The FRA data also indicate no train-involved accidents have occurred at the Olive Avenue crossing dating back to the year 2007. The crossing inventory and accident data is included in Appendix C.

4.6 Existing Traffic Volumes

Existing peak-hour traffic volumes were determined by performing manual turning movement counts at each of the study intersections. The traffic counts included a determination of the number of heavy vehicles on each turning movement. The traffic count data sheets are attached in Appendix D and include the date the counts were performed.

Existing peak hour turning movement volumes at the study intersections are presented in Figure 4-2, Existing A.M. and P.M. Peak Hour Traffic Volumes.

Existing 24-hour traffic volumes were determined by performing machine counts on roadways adjacent to the Project site. Table 4.1 presents the results of the 24-hour counts. The traffic count data sheets are attached in Appendix D.

Table 4.1
24-Hour Traffic Volumes

Road	Segment	24-Hour Volume
Fowler Avenue	Between Olive and Floradora Avenues	12,261
Armstrong Avenue	Between Olive and Floradora Avenues	3,079
Olive Avenue	Between Fowler and Armstrong Avenues	4,969
Floradora Avenue	Between Fowler and Armstrong Avenues	160

4.7 Existing-Conditions Intersection LOS and Signal Warrant Analysis

The results of the existing-conditions intersection LOS analyses and the peak-hour traffic signal warrants analyses are summarized in Table 4.2. Substandard conditions are identified in bold type. The intersection analysis sheets are presented in Appendix E and the peak-hour traffic signal warrant analyses are presented in Appendix F.

Table 4.2
Peak Hour Intersection Analysis Summary – Existing Conditions

Intersection	Control	A.M. Peak Hour			P.M. Peak Hour		
		Delay (sec)	LOS	Signal Warrant	Delay (sec)	LOS	Signal Warrant
Fowler / Floradora	OWS	11.5	B	n/a	20.4	C	n/a
Armstrong / Floradora	TWS	15.6	C	n/a	11.1	B	n/a
Fowler / Olive	AWS	**39.5**	**E**	2/2	**77.0**	**F**	2/2
Armstrong / Olive	AWS	23.4	C	n/a	9.4	A	n/a
Site Access / Floradora	DNE	-	-	-	-	-	-
Site Access / Olive	DNE	-	-	-	-	-	-

The intersection of Fowler and Olive Avenues is currently operating at LOS E during the a.m. peak hour and LOS F during the p.m. peak hour, with peak-hour traffic signal warrants satisfied during both peak hours.

The other study intersections are currently operating at acceptable levels of service.

4.8 Existing-Conditions Queuing Analysis

The study intersections are currently unsignalized. Queuing analyses are typically performed only for signalized intersection to evaluate potential issues related to blocking of adjacent lanes on different traffic signal phases. For the unsignalized study intersections, a queuing problem is considered to occur if a substandard LOS is calculated on any approach. Therefore, LOS results alone are necessary for the unsignalized study intersections.

4.9 Existing Conditions Road Segment Analyses

The results of the existing-conditions road segment analyses are summarized in Table 4.3. Detailed road segment analyses are presented in Appendix B.

Table 4.3
Road Segment Analysis Summary – Existing Conditions

Road Segment	A.M. Peak Hour		P.M. Peak Hour	
	Volume	LOS	Volume	LOS
Fowler Avenue between Olive and Floradora	693	B	1,033	C
Armstrong Avenue between Olive and Floradora	488	B	312	B
Olive Avenue between Fowler and Armstrong	666	C	368	C
Floradora Avenue between Fowler and Armstrong	21	C	15	C

The road segment analyses indicate that the study road segments are currently operating at acceptable levels of service.

5.0 NEAR-TERM AND LONG-TERM BASELINE TRAFFIC PROJECTIONS

5.1 Cumulative Projects

The analyses for the near-term and long-term conditions consider the effects of traffic expected to be generated by pending and approved projects in the study area. The projects listed in Table 5.1 are assumed to be constructed in the near-term condition.

Table 5.1
Cumulative Projects for Near-Term Conditions

Project	Location	A.M. Peak Hour Traffic Volumes		P.M. Peak Hour Traffic Volumes		Weekday Traffic Volumes
		Enter	Exit	Enter	Exit	
Tract 5499	Southeast of Fowler and Belmont	59	20	67	39	1,005
Tract 5552	East of Fowler Avenue between Church and Temperance	20	61	69	41	1,060
Tract 5531	California Avenue between Armstrong and Temperance	65	194	220	129	3,302
Fancher Creek*	NW of Clovis Avenue and Kings Canyon Road	2,780	1,864	3,879	4,610	89,423
Lonestar	Bounded by Church, Jensen, Fowler, and Sunnyside	Data obtained from project traffic sheets. Totals not included.				
Tract 4598	SE of Armstrong and Butler	18	53	59	35	906
Retail	NW of Clovis and Jensen	Data obtained from project traffic sheets. Totals not included.				
Tract 5464	SW of Hamilton and Temperance	35	104	118	69	1,832
Tract 5638	Church and Armstrong	85	257	290	170	4,356

* Although Fancher Creek is an approved project, build out will last several years and these traffic volumes will be considered in the long-term analyses based on the Fresno County travel model.

The traffic volumes expected to be generated at each of the study intersections by the pending projects described above are presented in Figure 5-1, Pending Projects Peak Hour Traffic Volumes.

5.2 Baseline Lane Configurations and Intersection Control

The baseline lane configurations for the near-term and long-term conditions are assumed to be the same as the existing conditions presented in Figure 4-1. For the long-term analysis scenario that includes the realignment of McKinley Avenue to the Floradora Avenue alignment, the baseline lane configurations are presented in Figure 5-2, Year 2035 Baseline Lane Configurations and Intersection Control - McKinley Avenue Realignment.

5.3 Baseline Near-Term Traffic Volumes

The baseline a.m. and p.m. peak hour traffic volumes for the near-term conditions were estimated by adding the pending projects traffic volumes presented in Figure 5-1 to the existing traffic volumes presented in Figure 4-2. The resulting traffic volumes are presented in Figure 5-3, Near-Term No-Project Peak Hour Traffic Volumes.

5.4 Traffic Modeling and Baseline 2035 Traffic Volumes

The Fresno Council of Governments (COG) maintains a travel model that is typically used to forecast traffic volumes. The COG's 2035 Fresno County travel model includes the assumption that 100 percent of the planned residential land uses in the 2025 Fresno General

Plan have been developed and approximately 90 percent of the planned commercial and industrial land uses have been developed. The baseline traffic volumes for the year 2035 no-Project conditions were determined using travel model data obtained from the COG and using the COG Increment Method, which is described in a document available from the COG entitled *"Model Steering Committee Recommended Procedures for Using Traffic Projections from the Fresno COG Travel Model"* dated December 2002. The Increment Method forecasts future traffic volumes by determining the growth projected by the model between the base year and the horizon year. This growth is then added to the existing traffic volumes.

Future turning movements were forecasted based on the methods presented in Chapter 8 of the Transportation Research Board National Cooperative Highway Research Program Report 255 entitled *"Highway Traffic Data for Urbanized Area Project Planning and Design."* The baseline 2035 no-Project traffic volumes are presented in Figure 5-4, 2035 No-Project Peak Hour Traffic Volumes. For the long-term analysis scenario that includes the realignment of McKinley Avenue to the Floradora Avenue alignment, the baseline 2035 no-Project traffic volumes are presented in Figure 5-5, 2035 No-Project Peak Hour Traffic Volumes - McKinley Avenue Realignment.

5.5 Funding for Transportation Projects

All projects in the City of Fresno are required to pay the applicable development fees. The City of Fresno Traffic Signal Mitigation Impact (TSMI) fee and the Fresno Major Street Impact (FMSI) fee program provide funds for construction of specified traffic signals and major street segments. The following intersections are programmed in the TSMI fee for signalization:

- Fowler Avenue / McKinley Avenue (includes dual left-turn lanes)
- Fowler Avenue / Olive Avenue
- Armstrong Avenue / McKinley Avenue (includes dual left-turn lanes)
- Armstrong Avenue / Olive Avenue.

If a project impacts an intersection on the TSMI list and causes signals to be warranted, it is typical for the developer to construct signals and receive fee credits and reimbursement out of the TSMI account.

The FMSI fee provides funding for construction of four through lanes on arterial streets and two through lanes for collector streets.

5.6 Measure C

The following is provided for informational purposes. The 2006 Measure C Extension Plan includes a half-cent sales tax throughout Fresno County for a 20-year extension period to fund freeway extensions, improve roads, and enhance public safety. Information related to Measure C can be found on the Measure C web site (www.measurec.com). Funding for the Regional Transportation Program Extension Projects comes from three sources:

- 50 percent from Measure C;
- 20 percent from the State Transportation Improvement Program (STIP); and
- 30 percent from the Regional Transportation Impact Fee Program (RTMF).

The RTMF Program is summarized in a report entitled Fresno Regional Transportation Mitigation Fee Final Report dated August 2008 by PB Americas, Inc.

The Measure C Extension Plan does not include any projects at the study locations.

5.7 High Speed Rail

The California High Speed Rail project includes alternatives that pass through Fresno. However, these alternatives are not within the Project study area.

6.0 YEAR 2035 NO-PROJECT CONDITIONS

6.1 Year 2035 No-Project Intersection LOS and Signal Warrant Analysis

The results of the year 2035 no-Project intersection LOS analyses and the peak-hour traffic signal warrants analyses are summarized in Table 6.1. Substandard conditions are identified in bold type. The intersection analysis sheets are presented in Appendix E and the peak-hour traffic signal warrant analyses are presented in Appendix F.

Table 6.1
Peak Hour Intersection Analysis Summary – 2035 No-Project Conditions

Intersection	Control	A.M. Peak Hour			P.M. Peak Hour		
		Delay (sec)	LOS	Signal Warrant	Delay (sec)	LOS	Signal Warrant
Fowler / Floradora	OWS	**44.2**	**E**	Not met	**479.1**	**F**	Not met
Armstrong / Floradora	TWS	**301.6**	**F**	Not met	**94.2**	**F**	Not met
Fowler / Olive	AWS	**712.5**	**F**	2/2	**865.8**	**F**	2/2
Armstrong / Olive	AWS	**634.0**	**F**	2/2	**555.6**	**F**	2/2
Site Access / Floradora	DNE	-	-	-	-	-	-
Site Access / Olive	DNE	-	-	-	-	-	-

All four of the study intersections are expected to operate at substandard levels of service during both the a.m. and p.m. peak hours. Peak-hour traffic signal warrants are expected to be satisfied at the following intersections:

- Fowler Avenue / Olive Avenue;
- Armstrong Avenue / Olive Avenue.

6.2 Year 2035 No-Project Road Segment Analyses

The results of the year 2035 no-Project road segment analyses are summarized in Table 6.2. Substandard conditions are identified in bold type. Detailed road segment analyses are presented in Appendix B. Substandard conditions are identified in bold type.

Table 6.2
Road Segment Analysis Summary – 2035 No-Project Conditions

Road Segment	A.M. Peak Hour		P.M. Peak Hour	
	Volume	LOS	Volume	LOS
Fowler Avenue between Olive and Floradora	**2,280**	**E**	**2,764**	**E**
Armstrong Avenue between Olive and Floradora	**1,801**	**E**	**1,830**	**E**
Olive Avenue between Fowler and Armstrong	**1,385**	**F**	**1,466**	**F**
Floradora Avenue between Fowler and Armstrong	42	C	30	C

The following study road segments are expected to operate at substandard levels of service:

- Fowler Avenue between Olive and Floradora Avenues (LOS E during the a.m. and p.m. peak hours);
- Armstrong Avenue between Olive and Floradora Avenues (LOS E during the a.m. and p.m. peak hours);
- Olive Avenue between Fowler and Armstrong Avenues (LOS F during the a.m. and p.m. peak hours).

Floradora Avenue is expected to operate at acceptable levels of service.

7.0 YEAR 2035 NO-PROJECT CONDITIONS (WITH McKINLEY AVENUE REALIGNMENT)

7.1 Year 2035 No-Project Intersection LOS and Signal Warrant Analysis

The results of the year 2035 no-Project intersection LOS analyses and the peak-hour traffic signal warrants analyses are summarized in Table 7.1. Substandard conditions are identified in bold type. The intersection analysis sheets are presented in Appendix E and the peak-hour traffic signal warrant analyses are presented in Appendix F.

Table 7.1
Peak Hour Intersection Analysis Summary – 2035 No-Project Conditions (With McKinley Avenue Realignment)

Intersection	Control	A.M. Peak Hour			P.M. Peak Hour		
		Delay (sec)	LOS	Signal Warrant	Delay (sec)	LOS	Signal Warrant
Fowler / Floradora	OWS	*****	**F**	2/2	*****	**F**	2/2
Armstrong / Floradora	TWS	*****	**F**	2/2	*****	**F**	2/2
Fowler / Olive	AWS	**712.5**	**F**	2/2	**865.8**	**F**	2/2
Armstrong / Olive	AWS	**634.0**	**F**	2/2	**555.6**	**F**	2/2
Site Access / Floradora	DNE	-	-	-	-	-	-
Site Access / Olive	DNE	-	-	-	-	-	-

All four of the study intersections are expected to operate at substandard levels of service during both the a.m. and p.m. peak hours. Peak-hour traffic signal warrants are expected to be satisfied at all four of the following intersections.

7.2 Year 2035 No-Project Road Segment Analyses

The results of the year 2035 no-Project road segment analyses are summarized in Table 7.2. Substandard conditions are identified in bold type. Detailed road segment analyses are presented in Appendix B. Substandard conditions are identified in bold type.

Table 7.2
Road Segment Analysis Summary – 2035 No-Project Conditions (With McKinley Avenue Realignment)

Road Segment	A.M. Peak Hour		P.M. Peak Hour	
	Volume	LOS	Volume	LOS
Fowler Avenue between Olive and Floradora	**2,407**	**E**	**2,749**	**E**
Armstrong Avenue between Olive and Floradora	**1,801**	**E**	**1,854**	**E**
Olive Avenue between Fowler and Armstrong	**1,385**	**F**	**1,466**	**F**
Floradora Avenue between Fowler and Armstrong	856	D	1,019	D

The following study road segments are expected to operate at substandard levels of service:

- Fowler Avenue between Olive and Floradora Avenues (LOS E during the a.m. and p.m. peak hours);
- Armstrong Avenue between Olive and Floradora Avenues (LOS E during the a.m. and p.m. peak hours);
- Olive Avenue between Fowler and Armstrong Avenues (LOS F during the a.m. and p.m. peak hours).

Floradora (McKinley) Avenue is expected to operate at acceptable levels of service.

8.0 PROJECT TRAFFIC

8.1 Project Trip Generation

Data provided in the Institute of Transportation Engineers (ITE) *Trip Generation, 8th Edition*, are typically used to estimate the number of trips anticipated to be generated by proposed projects. However, there is no data provided for water treatment plants or City corporation yards. West Yost Associates provided Peters Engineering Group with trip generation estimates for the Project based on anticipated numbers of employees and shift schedules which appear to be reasonable. Information provided by West Yost Associates is presented in Table 8.1.

In general, Phases 1 and 2 will generate few trips because a surface water treatment facility requires few employees. With the addition of the Water Division corporation yard and administrative offices in Phase 3 the number of employees at the site will increase substantially. Many of those employees will arrive before 7:00 a.m. and will leave the site after 7:00 a.m. in City vehicles. Those same City vehicles will typically return and the employees will leave the site in their personal vehicles before 4:00 p.m. Table 1 presents a summary of the daily and peak-hour trip generation estimates for the Project (peak hours occur between 7:00 and 9:00 a.m. and between 4:00 and 6:00 p.m.).

Table 8.1
Project Trip Generation

Project Scenario	Daily	A.M. Peak Hour			P.M. Peak Hour		
		In	Out	Total	In	Out	Total
Phase 1	28	6	3	9	3	6	9
Phases 1 and 2	40	9	3	12	3	9	12
Phases 1 through 3	872	81	172	253	5	81	86

Reference: West Yost Associates

Internal trip reductions and pass-by trip reductions are not applicable to the proposed project and are not considered in the analyses.

8.2 Project Trip Distribution and Assignment

The regional distribution of Project traffic can be estimated by performing a select zone analysis using available traffic models. A select zone analyses was performed by Council of Fresno County Governments (COG). Peters Engineering Group requested that COG perform a select zone analysis of the traffic analysis zone (TAZ) that includes the project site based on the land uses assumed in the 2035 Fresno County travel model. The select zone analysis request submitted to COG and the results of the select zone analysis performed by COG are presented in Appendix G.

The select zone analysis can be utilized to estimate the regional distribution of employee trips entering and exiting the site. The trips generated by the corporation yard (i.e., City work trucks leaving the site in the morning and returning to the site in the afternoon) are distributed manually assuming a relatively even distribution of traffic throughout the City of Fresno.

The percentage distribution of Project traffic is presented in the attached Figure 8-1, Project Trip Distribution Percentages.

The peak-hour Project traffic volumes presented in Table 8.1 were assigned to the study intersections and road segments in accordance with the trip distribution percentages described above. The peak-hour Project traffic volumes for Phases 1 and 2 are presented in Figure 8-2, Peak Hour Project Phases 1 and 2 Traffic Volumes. The peak-hour Project traffic volumes for Phases 1 through 3 are presented in Figure 8-3, Peak Hour Project Phases 1 Through 3 Traffic Volumes.

9.0 EXISTING-PLUS-PROJECT PHASES 1 AND 2 CONDITIONS

9.1 Existing-Plus-Project Phases 1 and 2 Lane Configurations and Intersection Control

The existing-plus-Project Phases 1 and 2 conditions lane configurations and intersection control are the same as the existing conditions presented in Figure 4-1.

9.2 Existing-Plus-Project Phases 1 and 2 Traffic Volumes

The existing-plus-Project Phases 1 and 2 conditions peak-hour traffic volumes are determined by adding the existing traffic volumes and the Project traffic volumes. The existing-plus-Project Phases 1 and 2 conditions peak-hour traffic volumes are presented in Figure 9-1, Existing-Plus-Project Phases 1 and 2 Peak Hour Traffic Volumes.

9.3 Existing-Plus-Project Phases 1 and 2 Intersection LOS and Signal Warrant Analysis

The results of the existing-plus-Project Phases 1 and 2 conditions intersection LOS analyses and the peak-hour traffic signal warrants analyses are summarized in Tables 9.1 and 9.2. Existing-conditions results are also presented in the tables for comparison. Project impacts, if any, are identified in bold type. The intersection analysis sheets are presented in Appendix H and the peak-hour traffic signal warrant analyses are presented in Appendix I.

Table 9.1
A.M. Peak Hour Intersection Analysis Summary
Existing-Plus-Project Phases 1 and 2 Conditions

Intersection	Control	Existing Conditions			Existing-Plus-Project Phases 1 and 2 Conditions		
		Delay (sec)	LOS	Signal Warrant	Delay (sec)	LOS	Signal Warrant
Fowler / Floradora	OWS	11.5	B	n/a	11.5	B	n/a
Armstrong / Floradora	TWS	15.6	C	n/a	15.6	C	n/a
Fowler / Olive	AWS	39.5	E	2/2	41.2	E	2/2
Armstrong / Olive	AWS	23.4	C	n/a	23.4	C	n/a
Site Access / Floradora	DNE	-	-	-	1.0	A	n/a
Site Access / Olive	DNE	-	-	-	12.1	B	n/a

Table 9.2
P.M. Peak Hour Intersection Analysis Summary
Existing-Plus-Project Phases 1 and 2 Conditions

Intersection	Control	Existing Conditions			Existing-Plus-Project Phases 1 and 2 Conditions		
		Delay (sec)	LOS	Signal Warrant	Delay (sec)	LOS	Signal Warrant
Fowler / Floradora	OWS	20.4	C	n/a	19.6	C	n/a
Armstrong / Floradora	TWS	11.1	B	n/a	11.1	B	n/a
Fowler / Olive	AWS	77.0	F	2/2	80.3	F	2/2
Armstrong / Olive	AWS	9.4	A	n/a	9.4	A	n/a
Site Access / Floradora	DNE	-	-	-	8.6	A	n/a
Site Access / Olive	DNE	-	-	-	9.2	A	n/a

The Project does not cause a significant impact based on intersection LOS criteria at the study intersections. Although the intersection of Fowler and Olive Avenues will operate at LOS E during the a.m. peak hour and LOS F during the p.m. peak hour, the Project does not exacerbate the existing delays by 5.0 seconds or more. Therefore, the impact is not significant.

9.4 Existing-Plus-Project Phases 1 and 2 Road Segment Analyses

The results of the existing-plus-Project Phases 1 and 2 road segment analyses are summarized in Tables 9.3 and 9.4. Existing-conditions results are also presented in the tables for comparison. Project impacts, if any, are identified in bold type. Detailed road segment analyses are presented in Appendix B.

Table 9.3
A.M. Peak Hour Road Segment Analysis Summary
Existing-Plus-Project Phases 1 and 2 Conditions

Road Segment	Existing Conditions		Existing-Plus-Project Phases 1 and 2 Conditions	
	Volume	LOS	Volume	LOS
Fowler Avenue between Olive and Floradora	693	B	693	B
Armstrong Avenue between Olive and Floradora	488	B	488	B
Olive Avenue between Fowler and Armstrong	666	C	666	C
Floradora Avenue between Fowler and Armstrong	21	C	21	C

Table 9.4
P.M. Peak Hour Road Segment Analysis Summary
Existing-Plus-Project Phases 1 and 2 Conditions

Road Segment	Existing Conditions		Existing-Plus-Project Phases 1 and 2 Conditions	
	Volume	LOS	Volume	LOS
Fowler Avenue between Olive and Floradora	1,033	C	1,033	C
Armstrong Avenue between Olive and Floradora	312	B	312	B
Olive Avenue between Fowler and Armstrong	368	C	375	C
Floradora Avenue between Fowler and Armstrong	15	C	15	C

The Project does not cause a significant impact based on road segment LOS criteria at the study intersections.

9.5 Transit, Bicycle, and Pedestrian Facilities

Phases 1 and 2 of the proposed Project are not expected to impede or interfere with existing transit, bicycle, and pedestrian facilities.

9.6 At-Grade Railroad Crossing

The proposed Project is not expected to change the operational characteristics or safety of the existing Olive Avenue railroad crossing at Clovis Avenue, especially considering the low-speed, low-volume nature of the existing rail spur.

10.0 EXISTING-PLUS-PROJECT PHASES 1 THROUGH 3 CONDITIONS

10.1 Existing-Plus-Project Phases 1 Through 3 Lane Configurations and Intersection Control

The existing-plus-Project Phases 1 through 3 conditions lane configurations and intersection control are the same as the existing conditions presented in Figure 4-1.

10.2 Existing-Plus-Project Phases 1 Through 3 Traffic Volumes

The existing-plus-Project Phases 1 through 3 conditions peak-hour traffic volumes are determined by adding the existing traffic volumes and the Project traffic volumes. The existing-plus-Project Phases 1 through 3 conditions peak-hour traffic volumes are presented in Figure 10-1, Existing-Plus-Project Phases 1 Through 3 Peak Hour Traffic Volumes.

10.3 Existing-Plus-Project Phases 1 Through 3 Intersection LOS and Signal Warrant Analysis

The results of the existing-plus-Project Phases 1 through 3 conditions intersection LOS analyses and the peak-hour traffic signal warrants analyses are summarized in Tables 10.1 and 10.2. Existing-conditions results are also presented in the tables for comparison. Project impacts, if any, are identified in bold type. The intersection analysis sheets are presented in Appendix H and the peak-hour traffic signal warrant analyses are presented in Appendix I.

Table 10.1
A.M. Peak Hour Intersection Analysis Summary
Existing-Plus-Project Phases 1 Through 3 Conditions

Intersection	Control	Existing Conditions			Existing-Plus-Project Phases 1 Through 3 Conditions		
		Delay (sec)	LOS	Signal Warrant	Delay (sec)	LOS	Signal Warrant
Fowler / Floradora	OWS	11.5	B	n/a	16.0	C	n/a
Armstrong / Floradora	TWS	15.6	C	n/a	15.8	C	n/a
Fowler / Olive	AWS	39.5	E	2/2	**85.8**	**F**	2/2
Armstrong / Olive	AWS	23.4	C	n/a	24.7	C	n/a
Site Access / Floradora	DNE	-	-	-	9.0	A	n/a
Site Access / Olive	DNE	-	-	-	14.3	B	n/a

Table 10.2
P.M. Peak Hour Intersection Analysis Summary
Existing-Plus-Project Phases 1 Through 3 Conditions

Intersection	Control	Existing Conditions			Existing-Plus-Project Phases 1 Through 3 Conditions		
		Delay (sec)	LOS	Signal Warrant	Delay (sec)	LOS	Signal Warrant
Fowler / Floradora	OWS	20.4	C	n/a	22.8	C	n/a
Armstrong / Floradora	TWS	11.1	B	n/a	10.9	B	n/a
Fowler / Olive	AWS	77.0	F	2/2	**91.1**	**F**	2/2
Armstrong / Olive	AWS	9.4	A	n/a	9.4	A	n/a
Site Access / Floradora	DNE	-	-	-	8.7	A	n/a
Site Access / Olive	DNE	-	-	-	9.5	A	n/a

Phase 3 of the Project causes a significant impact based on intersection LOS criteria at the intersection of Fowler and Olive Avenues. Phase 3 of the Project will cause the a.m. peak hour LOS to drop from LOS E to LOS F and will exacerbate a substandard LOS F by more than 5.0 seconds during the p.m. peak hour. Peak hour traffic signal warrants are satisfied.

10.4 Existing-Plus-Project Phases 1 Through 3 Road Segment Analyses

The results of the existing-plus-Project Phases 1 through 3 road segment analyses are summarized in Tables 10.3 and 10.4. Existing-conditions results are also presented in the tables for comparison. Project impacts, if any, are identified in bold type. Detailed road segment analyses are presented in Appendix B.

Table 10.3
A.M. Peak Hour Road Segment Analysis Summary
Existing-Plus-Project Phases 1 Through 3 Conditions

Road Segment	Existing Conditions		Existing-Plus-Project Phases 1 Through 3 Conditions	
	Volume	LOS	Volume	LOS
Fowler Avenue between Olive and Floradora	693	B	758	B
Armstrong Avenue between Olive and Floradora	488	B	492	B
Olive Avenue between Fowler and Armstrong	666	C	791	C
Floradora Avenue between Fowler and Armstrong	21	C	91	C

Table 10.4
P.M. Peak Hour Road Segment Analysis Summary
Existing-Plus-Project Phases 1 Through 3 Conditions

Road Segment	Existing Conditions		Existing-Plus-Project Phases 1 Through 3 Conditions	
	Volume	LOS	Volume	LOS
Fowler Avenue between Olive and Floradora	1,033	C	1,055	C
Armstrong Avenue between Olive and Floradora	312	B	314	B
Olive Avenue between Fowler and Armstrong	368	C	417	C
Floradora Avenue between Fowler and Armstrong	15	C	42	C

The Project does not cause a significant impact based on road segment LOS criteria at the study intersections.

10.5 Transit, Bicycle, and Pedestrian Facilities

The proposed Project is not expected to impede or interfere with existing transit, bicycle, and pedestrian facilities.

10.6 At-Grade Railroad Crossing

The proposed Project is not expected to change the operational characteristics or safety of the existing Olive Avenue railroad crossing at Clovis Avenue, especially considering the low-speed, low-volume nature of the existing rail spur.

10.7 Existing-Plus-Project Phases 1 Through 3 Conditions Impacts and Mitigations

The existing-plus-Project Phases 1 through 3 conditions analyses are based on conditions expected to exist if the Project were to be constructed immediately without the development of any of the pending projects. Traffic impacts identified in the existing-plus-Project Phases 1 through 3 conditions analyses are stated below, followed by the recommended mitigation. The mitigated intersection analysis sheets are included in Appendix J.

Impact E-1

At the intersection of Fowler and Olive Avenues, after construction of Phases 1 and 2 of the Project, Phase 3 of the Project will cause the a.m. peak hour LOS to drop from LOS E to LOS F and will exacerbate a substandard LOS F by more than 5.0 seconds during the p.m. peak hour.

Mitigation E-1

Phase 3 of the Project shall construct this mitigation. The intersection of Fowler and Olive Avenues shall be signalized in accordance with City of Fresno standards including protected left-turn phasing and the following minimum lane configurations:

Eastbound: one left-turn lane and a shared through/right-turn lane
Westbound: two left-turn lanes and a shared through/right-turn lane
Northbound: one left-turn lane and a shared through/right-turn lane
Southbound: one left-turn lane and a shared through/right-turn lane

With implementation of this mitigation the intersection will operate at LOS C and 95^{th}-percentile queues in the left-turn and right-turn lanes will be 219 feet or less. Therefore, standard City of Fresno turn lanes are recommended.

This mitigation is potentially constrained by existing businesses and residences.

11.0 NEAR-TERM WITH-PROJECT PHASES 1 AND 2 CONDITIONS

11.1 Near-Term With-Project Phases 1 and 2 Lane Configurations and Intersection Control

The near-term With-Project Phases 1 and 2 conditions lane configurations and intersection control are the same as the existing conditions presented in Figure 4-1.

11.2 Near-Term With-Project Phases 1 and 2 Traffic Volumes

The near-term with-Project Phases 1 and 2 conditions peak-hour traffic volumes are determined by adding the near-term baseline traffic volumes and the Project traffic volumes. The near-term with-Project Phases 1 and 2 conditions peak-hour traffic volumes are presented in Figure 11-1, Near-Term With-Project Phases 1 and 2 Peak Hour Traffic Volumes.

11.3 Near-Term With-Project Phases 1 and 2 Intersection LOS and Signal Warrant Analysis

The results of the near-term with-Project Phases 1 and 2 conditions intersection LOS analyses and the peak-hour traffic signal warrants analyses are summarized in Tables 11.1 and 11.2. Existing-conditions results are also presented in the tables for comparison. Cumulative impacts, if any, are identified in bold type. The intersection analysis sheets are presented in Appendix H and the peak-hour traffic signal warrant analyses are presented in Appendix I.

Table 11.1
A.M. Peak Hour Intersection Analysis Summary
Near-Term With-Project Phases 1 and 2 Conditions

Intersection	Control	Existing Conditions			Near-Term With Project Conditions		
		Delay (sec)	LOS	Signal Warrant	Delay (sec)	LOS	Signal Warrant
Fowler / Floradora	OWS	11.5	B	n/a	13.2	B	n/a
Armstrong / Floradora	TWS	15.6	C	n/a	16.2	C	n/a
Fowler / Olive	AWS	39.5	E	2/2	**100.8**	**F**	2/2
Armstrong / Olive	AWS	23.4	C	n/a	33.2	D	n/a
Site Access / Floradora	DNE	-	-	-	1.0	A	n/a
Site Access / Olive	DNE	-	-	-	12.7	B	n/a

Table 11.2
P.M. Peak Hour Intersection Analysis Summary
Near-Term With-Project Phases 1 and 2 Conditions

Intersection	Control	Existing Conditions			Near-Term With Project Conditions		
		Delay (sec)	LOS	Signal Warrant	Delay (sec)	LOS	Signal Warrant
Fowler / Floradora	OWS	20.4	C	n/a	31.4	D	n/a
Armstrong / Floradora	TWS	11.1	B	n/a	11.3	B	n/a
Fowler / Olive	AWS	77.0	F	2/2	**251.1**	**F**	2/2
Armstrong / Olive	AWS	9.4	A	n/a	10.0	A	n/a
Site Access / Floradora	DNE	-	-	-	8.6	A	n/a
Site Access / Olive	DNE	-	-	-	9.5	A	n/a

Phases 1 and 2 of the Project contribute to a significant cumulative impact in the near-term condition based on intersection LOS criteria at the intersection of Fowler and Olive Avenues. The cumulative projects will cause the a.m. peak hour LOS to drop from LOS E to LOS F and will exacerbate a substandard LOS F by more than 5.0 seconds during the p.m. peak hour. Peak hour traffic signal warrants are satisfied.

11.4 Near-Term With-Project Phases 1 and 2 Road Segment Analyses

The results of the near-term with-Project Phases 1 and 2 road segment analyses are summarized in Tables 11.3 and 11.4. Existing-conditions results are also presented in the tables for comparison. Cumulative impacts, if any, are identified in bold type. Detailed road segment analyses are presented in Appendix B.

Table 11.3
A.M. Peak Hour Road Segment Analysis Summary
Near-Term With-Project Phases 1 and 2 Conditions

Road Segment	Existing Conditions		Near-Term With Project Conditions	
	Volume	LOS	Volume	LOS
Fowler Avenue between Olive and Floradora	693	B	934	C
Armstrong Avenue between Olive and Floradora	488	B	515	B
Olive Avenue between Fowler and Armstrong	666	C	178	C
Floradora Avenue between Fowler and Armstrong	21	C	22	C

Table 11.4
P.M. Peak Hour Road Segment Analysis Summary
Near-Term With-Project Phases 1 and 2 Conditions

Road Segment	Existing Conditions		Near-Term With Project Conditions	
	Volume	LOS	Volume	LOS
Fowler Avenue between Olive and Floradora	1,033	C	**1,424**	**E**
Armstrong Avenue between Olive and Floradora	312	B	335	B
Olive Avenue between Fowler and Armstrong	368	C	441	C
Floradora Avenue between Fowler and Armstrong	15	C	16	C

Phases 1 and 2 of the Project contribute to a significant cumulative impact in the near-term condition based on road segment LOS criteria on Fowler Avenue between Olive and

Floradora Avenues. The cumulative projects will cause the p.m. peak hour LOS to drop from LOS C to LOS E.

11.5 At-Grade Railroad Crossing

The proposed Project is not expected to change the operational characteristics or safety of the existing Olive Avenue railroad crossing at Clovis Avenue, especially considering the low-speed, low-volume nature of the existing rail spur.

11.6 Near-Term With-Project Phases 1 and 2 Conditions Project Impacts and Mitigations

The near-term with-Project Phases 1 and 2 conditions analyses are based on conditions expected to exist after construction of the pending projects and the proposed Project Phases 1 and 2. Project traffic impacts identified in the near-term with-Project Phases 1 and 2 conditions analyses are stated below, followed by the recommended mitigation. The mitigated intersection analysis sheets are included in Appendix J.

Impact NT2-1

Phases 1 and 2 of the Project contribute to a significant cumulative impact in the near-term condition based on intersection LOS criteria at the intersection of Fowler and Olive Avenues. The cumulative projects will cause the a.m. peak hour LOS to drop from LOS E to LOS F and will exacerbate a substandard LOS F by more than 5.0 seconds during the p.m. peak hour.

Mitigation NT2-1

This mitigation is identical to Mitigation E-1. The intersection of Fowler and Olive Avenues shall be signalized in accordance with City of Fresno standards including protected left-turn phasing and the following minimum lane configurations:

Eastbound:	one left-turn lane and a shared through/right-turn lane
Westbound:	two left-turn lanes and a shared through/right-turn lane
Northbound:	one left-turn lane and a shared through/right-turn lane
Southbound:	one left-turn lane and a shared through/right-turn lane

With implementation of this mitigation the intersection will operate at LOS C and 95^{th}-percentile queues in the left-turn and right-turn lanes will be 189 feet or less. Therefore, standard City of Fresno turn lanes are recommended.

This mitigation is potentially constrained by existing businesses and residences.

Phases 1 and 2 of the Project shall pay the applicable TSMI and FMSI fees to mitigate the Project's fair share of this cumulative impact.

Impact NT2-2

Phases 1 and 2 of the Project contribute to a significant cumulative impact in the near-term condition based on road segment LOS criteria on Fowler Avenue between Olive and Floradora Avenues. The cumulative projects will cause the p.m. peak hour LOS to drop from LOS C to LOS E.

Mitigation NT2-2

Fowler Avenue between Olive and Floradora Avenues shall be widened to four lanes with a median per City of Fresno standards. In order to effectively utilize the additional lanes, the widening project shall extend south of Olive Avenue to match the existing four-lane section of Fowler Avenue. With implementation of this mitigation Fowler Avenue will operate at LOS B during the peak hours.

This mitigation is potentially constrained by existing businesses and residences.

Phases 1 and 2 of the Project shall pay the applicable FMSI fee to mitigate the Project's fair share of this cumulative impact.

12.0 NEAR-TERM WITH-PROJECT PHASES 1 THROUGH 3 CONDITIONS

12.1 Near-Term With-Project Phases 1 Through 3 Lane Configurations and Intersection Control

The near-term with-Project Phases 1 through 3 conditions lane configurations and intersection control are the same as the existing conditions presented in Figure 4-1.

12.2 Near-Term With-Project Phases 1 Through 3 Traffic Volumes

The near-term with-Project Phases 1 through 3 conditions peak-hour traffic volumes are determined by adding the near-term baseline traffic volumes and the Project traffic volumes. The near-term with-Project Phases 1 through 3 conditions peak-hour traffic volumes are presented in Figure 12-1, Near-Term With-Project Phases 1 Through 3 A.M. and P.M. Peak Hour Traffic Volumes.

12.3 Near-Term With-Project Phases 1 Through 3 Intersection LOS and Signal Warrant Analysis

The results of the near-term with-Project Phases 1 through 3 conditions intersection LOS analyses and the peak-hour traffic signal warrants analyses are summarized in Tables 12.1 and 12.2. Existing-conditions results are also presented in the tables for comparison. Cumulative impacts, if any, are identified in bold type. The intersection analysis sheets are presented in Appendix H and the peak-hour traffic signal warrant analyses are presented in Appendix I.

Table 12.1
A.M. Peak Hour Intersection Analysis Summary
Near-Term With-Project Phases 1 Through 3 Conditions

Intersection	Control	Existing Conditions			Near-Term With Project Conditions		
		Delay (sec)	LOS	Signal Warrant	Delay (sec)	LOS	Signal Warrant
Fowler / Floradora	OWS	11.5	B	n/a	21.5	C	n/a
Armstrong / Floradora	TWS	15.6	C	n/a	16.5	C	n/a
Fowler / Olive	AWS	39.5	E	2/2	**153.0**	**F**	2/2
Armstrong / Olive	AWS	23.4	C	n/a	**35.0**	**E**	2/2
Site Access / Floradora	DNE	-	-	-	9.0	A	n/a
Site Access / Olive	DNE	-	-	-	15.5	C	n/a

Table 12.2
P.M. Peak Hour Intersection Analysis Summary
Near-Term With-Project Phases 1 Through 3 Conditions

Intersection	Control	Existing Conditions			Near-Term With Project Conditions		
		Delay (sec)	LOS	Signal Warrant	Delay (sec)	LOS	Signal Warrant
Fowler / Floradora	OWS	20.4	C	n/a	**41.9**	**E**	Not met
Armstrong / Floradora	TWS	11.1	B	n/a	11.1	B	n/a
Fowler / Olive	AWS	77.0	F	2/2	**271.2**	**F**	2/2
Armstrong / Olive	AWS	9.4	A	n/a	10.0	B	n/a
Site Access / Floradora	DNE	-	-	-	8.7	A	n/a
Site Access / Olive	DNE	-	-	-	9.8	A	n/a

Phases 1 through 3 of the Project contribute to significant cumulative impacts in the near-term condition based on intersection LOS criteria at the following intersections:

- Fowler Avenue / Floradora Avenue: cumulative projects will cause a substandard p.m. peak hour LOS E, peak hour traffic signal warrants not met;
- Fowler Avenue / Olive Avenue: cumulative projects will cause the a.m. peak hour LOS to drop from LOS E to LOS F and will exacerbate a substandard LOS F by more than 5.0 seconds during the p.m. peak hour, peak hour traffic signal warrants met;
- Armstrong Avenue / Olive Avenue: cumulative projects will cause a substandard a.m. peak hour LOS E, peak hour traffic signal warrants met.

12.4 Near-Term With-Project Phases 1 Through 3 Road Segment Analyses

The results of the near-term with-Project Phases 1 through 3 road segment analyses are summarized in Tables 12.3 and 12.4. Existing-conditions results are also presented in the tables for comparison. Cumulative impacts, if any, are identified in bold type. Detailed road segment analyses are presented in Appendix B.

Table 12.3
A.M. Peak Hour Road Segment Analysis Summary
Near-Term With-Project Phases 1 Through 3 Conditions

Road Segment	Existing Conditions		Near-Term With Project Conditions	
	Volume	**LOS**	**Volume**	**LOS**
Fowler Avenue between Olive and Floradora	693	B	999	C
Armstrong Avenue between Olive and Floradora	488	B	519	B
Olive Avenue between Fowler and Armstrong	666	C	842	C
Floradora Avenue between Fowler and Armstrong	21	C	91	C

Table 12.4
P.M. Peak Hour Road Segment Analysis Summary
Near-Term With-Project Phases 1 Through 3 Conditions

Road Segment	Existing Conditions		Near-Term With Project Conditions	
	Volume	LOS	Volume	LOS
Fowler Avenue between Olive and Floradora	1,033	C	**1,446**	**E**
Armstrong Avenue between Olive and Floradora	312	B	337	B
Olive Avenue between Fowler and Armstrong	368	C	483	C
Floradora Avenue between Fowler and Armstrong	15	C	42	C

Phases 1 through 3 of the Project contribute to a significant cumulative impact in the near-term condition based on road segment LOS criteria on Fowler Avenue between Olive and Floradora Avenues. The cumulative projects will cause the p.m. peak hour LOS to drop from LOS C to LOS E.

12.5 At-Grade Railroad Crossing

The proposed Project is not expected to change the operational characteristics or safety of the existing Olive Avenue railroad crossing at Clovis Avenue, especially considering the low-speed, low-volume nature of the existing rail spur.

12.6 Near-Term With-Project Phases 1 Through 3 Conditions Project Impacts and Mitigations

The near-term with-Project Phases 1 through 3 conditions analyses are based on conditions expected to exist after construction of the pending projects and the proposed Project. Project traffic impacts identified in the near-term with-Project Phases 1 through 3 conditions analyses are stated below, followed by the recommended mitigation. The mitigated intersection analysis sheets are included in Appendix J.

Impact NT3-1

Phases 1 through 3 of the Project contribute to a significant cumulative impact in the near-term condition based on intersection LOS criteria at the intersection of Fowler and Floradora Avenues. The cumulative projects will cause a substandard p.m. peak hour LOS E.

Mitigation NT3-1

The intersection of Fowler and Floradora (future McKinley) Avenues shall be widened in accordance with City of Fresno standards with two-way stop-control and the following minimum lane configurations:

Eastbound: does not exist
Westbound: one shared left-turn/right-turn lane
Northbound: two through lanes with a shared right turn
Southbound: one left-turn lane and two through lanes

With implementation of this mitigation the intersection will operate at LOS B during the a.m. peak hour and LOS C during the p.m. peak hour. This mitigation is potentially constrained by existing businesses and residences.

Phases 1 through 3 of the Project shall pay the applicable TSMI and FMSI fees to mitigate the Project's fair share of this cumulative impact.

Impact NT3-2

Phases 1 through 3 of the Project contribute to a significant cumulative impact in the near-term condition based on intersection LOS criteria at the intersection of Fowler and Olive Avenues. The cumulative projects will cause the a.m. peak hour LOS to drop from LOS E to LOS F and will exacerbate a substandard LOS F by more than 5.0 seconds during the p.m. peak hour.

Mitigation NT3-2

The intersection of Fowler and Olive Avenues shall be signalized in accordance with City of Fresno standards including protected left-turn phasing and the following minimum lane configurations:

Eastbound: one left-turn lane and a shared through/right-turn lane
Westbound: two left-turn lanes and a shared through/right-turn lane
Northbound: one left-turn lane and two through lanes with a shared right turn
Southbound: one left-turn lane and two through lanes with a shared right turn

With implementation of this mitigation the intersection will operate at LOS C and 95^{th}-percentile queues in the left-turn and right-turn lanes will be 196 feet or less. Therefore, standard City of Fresno turn lanes are recommended. This mitigation is potentially constrained by existing businesses and residences.

Phases 1 through 3 of the Project shall pay the applicable TSMI and FMSI fees to mitigate the Project's fair share of this cumulative impact. The construction of facilities as required in Mitigation E-1 that also satisfy the requirements of Mitigation NT3-2 shall be credited against the fees paid by Phase 3 of the Project.

Impact NT3-3

Phases 1 through 3 of the Project contribute to a significant cumulative impact in the near-term condition based on intersection LOS criteria at the intersection of Armstrong and Olive Avenues. The cumulative projects will cause a substandard a.m. peak hour LOS E.

Mitigation NT3-3

The intersection of Armstrong and Olive Avenues shall be signalized in accordance with City of Fresno standards including protected left-turn phasing and the following minimum lane configurations:

Eastbound: one left-turn lane and a shared through/right-turn lane
Westbound: one left-turn lane and a shared through/right-turn lane
Northbound: one left-turn lane and a shared through/right-turn lane
Southbound: one left-turn lane and a shared through/right-turn lane

With implementation of this mitigation the intersection will operate at LOS C during the a.m. peak hour and LOS B during the p.m. peak hour; 95^{th}-percentile queues in the left-turn and right-turn lanes will be 95 feet or less. Therefore, standard City of Fresno turn lanes are recommended.

Phases 1 through 3 of the Project shall pay the applicable TSMI and FMSI fees to mitigate the Project's fair share of this cumulative impact.

Impact NT3-4

Phases 1 through 3 of the Project contribute to a significant cumulative impact in the near-term condition based on road segment LOS criteria on Fowler Avenue between Olive and Floradora Avenues. The cumulative projects will cause the p.m. peak hour LOS to drop from LOS C to LOS E.

Mitigation NT3-4

This mitigation is identical to Mitigation NT2-2. Fowler Avenue between Olive and Floradora Avenues shall be widened to four lanes with a median per City of Fresno standards. In order to effectively utilize the additional lanes, the widening project shall extend south of Olive Avenue to match the existing four-lane section of Fowler Avenue. With implementation of this mitigation Fowler Avenue will operate at LOS B during the peak hours.

This mitigation is potentially constrained by existing businesses and residences.

Phases 1 through 3 of the Project shall pay the applicable FMSI fee to mitigate the Project's fair share of this cumulative impact.

13.0 YEAR 2035 WITH-PROJECT CONDITIONS

13.1 Year 2035 With-Project Lane Configurations and Intersection Control

The year 2035 with-Project conditions lane configurations and intersection control are the same as the existing conditions presented in Figure 4-1.

13.2 Year 2035 With-Project Traffic Volumes

The year 2035 with-Project conditions peak-hour traffic volumes are determined by adding the 2035 baseline traffic volumes and the Project traffic volumes. The year 2035 with-Project conditions peak-hour traffic volumes are presented in Figure 13-1, Year 2035 With-Project A.M. and P.M. Peak Hour Traffic Volumes.

13.3 Year 2035 With-Project Intersection LOS and Signal Warrant Analysis

The results of the year 2035 with-Project conditions intersection LOS analyses and the peak-hour traffic signal warrants analyses are summarized in Tables 13.1 and 13.2. Existing-conditions results are also presented in the tables for comparison. Cumulative impacts, if any, are identified in bold type. The intersection analysis sheets are presented in Appendix H and the peak-hour traffic signal warrant analyses are presented in Appendix I.

Table 13.1
A.M. Peak Hour Intersection Analysis Summary – 2035 With-Project Conditions

Intersection	Control	Existing Conditions			2035 With Project Conditions		
		Delay (sec)	LOS	Signal Warrant	Delay (sec)	LOS	Signal Warrant
Fowler / Floradora	OWS	11.5	B	n/a	**582.1**	**F**	Not met
Armstrong / Floradora	TWS	15.6	C	n/a	**314.7**	**F**	Not met
Fowler / Olive	AWS	**39.5**	**E**	2/2	**765.0**	**F**	2/2
Armstrong / Olive	AWS	23.4	C	n/a	**639.1**	**F**	2/2
Site Access / Floradora	DNE	-	-	-	9.0	A	
Site Access / Olive	DNE	-	-	-	30.5	D	

Table 13.2
P.M. Peak Hour Intersection Analysis Summary – 2035 With-Project Conditions

Intersection	Control	Existing Conditions			2035 With Project Conditions		
		Delay (sec)	LOS	Signal Warrant	Delay (sec)	LOS	Signal Warrant
Fowler / Floradora	OWS	20.4	C	n/a	**1,111.2**	**F**	Not met
Armstrong / Floradora	TWS	11.1	B	n/a	**108.5**	**F**	Not met
Fowler / Olive	AWS	**77.0**	**F**	2/2	**871.4**	**F**	2/2
Armstrong / Olive	AWS	9.4	A	n/a	**600.6**	**F**	2/2
Site Access / Floradora	DNE	-	-	-	8.8	A	
Site Access / Olive	DNE	-	-	-	16.0	C	

The Project significantly contributes to cumulative impacts in the year 2035 conditions based on intersection LOS criteria at the following intersections:

- Fowler Avenue / Floradora Avenue: the Project will cause the a.m. peak hour LOS to drop from LOS E to LOS F and will exacerbate a substandard LOS F by more than 5.0 seconds during the p.m. peak hour, peak hour traffic signal warrants not met;
- Armstrong Avenue / Floradora Avenue: the Project will exacerbate a substandard LOS F by more than 5.0 seconds during the a.m. and p.m. peak hours, peak hour traffic signal warrants not met;
- Fowler Avenue / Olive Avenue: the Project will exacerbate a substandard LOS F by more than 5.0 seconds during the a.m. and p.m. peak hours, peak hour traffic signal warrants met;
- Armstrong Avenue / Olive Avenue: the Project will exacerbate a substandard LOS F by more than 5.0 seconds during the a.m. and p.m. peak hours, peak hour traffic signal warrants met.

13.4 Year 2035 With-Project Road Segment Analyses

The results of the year 2035 with-Project road segment analyses are summarized in Tables 13.3 and 13.4. Existing-conditions results are also presented in the tables for comparison. Cumulative impacts, if any, are identified in bold type. Detailed road segment analyses are presented in Appendix B.

Table 13.3
A.M. Peak Hour Road Segment Analysis Summary – 2035 With-Project Conditions

Road Segment	Existing Conditions		2035 With Project Conditions	
	Volume	LOS	Volume	LOS
Fowler Avenue between Olive and Floradora	693	B	**2,345**	**E**
Armstrong Avenue between Olive and Floradora	488	B	**1,805**	**E**
Olive Avenue between Fowler and Armstrong	666	C	**1,533**	**F**
Floradora Avenue between Fowler and Armstrong	21	C	98	C

Table 13.4
P.M. Peak Hour Road Segment Analysis Summary – 2035 With-Project Conditions

Road Segment	Existing Conditions		2035 With Project Conditions	
	Volume	LOS	Volume	LOS
Fowler Avenue between Olive and Floradora	1,033	C	**2,786**	**E**
Armstrong Avenue between Olive and Floradora	312	B	**1,832**	**E**
Olive Avenue between Fowler and Armstrong	368	C	**1,519**	**F**
Floradora Avenue between Fowler and Armstrong	15	C	57	C

The Project significantly contributes to cumulative impacts in the year 2035 conditions based on road segment LOS criteria at the following road segments:

- Fowler Avenue between Olive and Floradora Avenues: regional growth, including the proposed Project, will cause the a.m. peak hour LOS to drop from LOS B to LOS E and will cause the p.m. peak hour LOS to drop from LOS C to LOS E;
- Armstrong Avenue between Olive and Floradora Avenues: regional growth, including the proposed Project, will cause the a.m. peak hour LOS to drop from LOS B to LOS E and will cause the p.m. peak hour LOS to drop from LOS B to LOS E;
- Olive Avenue between Fowler and Armstrong Avenues: regional growth, including the proposed Project, will cause the a.m. peak hour LOS to drop from LOS C to LOS F and will cause the p.m. peak hour LOS to drop from LOS C to LOS F.

13.5 At-Grade Railroad Crossing

The proposed Project is not expected to change the operational characteristics or safety of the existing Olive Avenue railroad crossing at Clovis Avenue, especially considering the low-speed, low-volume nature of the existing rail spur.

13.6 Year 2035 With-Project Conditions Project Impacts and Mitigations

Significant traffic impacts identified in the year 2035 with-Project conditions analyses are stated below, followed by the recommended mitigation. The mitigated intersection analysis sheets are included in Appendix J and the mitigated road segment analyses are presented in Appendix B.

Impact 2035-1

The Project will contribute to a significant cumulative impact in the long-term condition based on intersection LOS criteria at the intersection of Fowler and Floradora Avenues. The Project will cause the a.m. peak hour LOS to drop from LOS E to LOS F and will exacerbate a substandard LOS F by more than 5.0 seconds during the p.m. peak hour.

Mitigation 2035-1

All-way stop control will not provide acceptable levels of service and the installation of traffic signals is not a feasible mitigation since peak-hour traffic signal warrants are not satisfied. The intersection of Fowler and Floradora Avenues shall be widened in accordance with City of Fresno standards with two-way stop-control and the following minimum lane configurations:

Eastbound: one shared left-turn/right-turn lane
Westbound: does not exist
Northbound: two through lanes with a shared right turn
Southbound: one left-turn lane and two through lanes

With implementation of this mitigation the westbound approach to the intersection will operate at LOS F during both peak hours and the impact will remain significant.

Phases 1 through 3 of the Project shall pay the applicable FMSI fee for road improvements to mitigate the Project's fair share of this cumulative impact.

Impact 2035-2

The Project will contribute to a significant cumulative impact in the long-term condition based on intersection LOS criteria at the intersection of Armstrong and Floradora Avenues. The Project will exacerbate a substandard LOS F by more than 5.0 seconds during the a.m. and p.m. peak hours.

Mitigation 2035-2

All-way stop control will not provide acceptable levels of service and the installation of traffic signals is not a feasible mitigation since peak-hour traffic signal warrants are not satisfied. The intersection of Armstrong and Floradora Avenues shall be widened in accordance with City of Fresno standards with two-way stop-control and the following minimum lane configurations:

Eastbound: one shared left-turn/through/right-turn lane
Westbound: one shared left-turn/through/right-turn lane
Northbound: one left-turn lane and two through lanes with a shared right turn
Southbound: one left-turn lane and two through lanes with a shared right turn

With implementation of this mitigation the eastbound and westbound approaches to the intersection will operate at LOS F during both peak hours and the impact will remain significant.

Phases 1 through 3 of the Project shall pay the applicable FMSI fee for road improvements to mitigate the Project's fair share of this cumulative impact.

Impact 2035-3

The Project will contribute to a significant cumulative impact in the long-term condition based on intersection LOS criteria at the intersection of Fowler and Olive Avenues. The Project will exacerbate a substandard LOS F by more than 5.0 seconds during the a.m. and p.m. peak hours.

Mitigation 2035-3

The intersection of Fowler and Olive Avenues shall be signalized in accordance with City of Fresno standards including protected left-turn phasing and the following minimum lane configurations:

Eastbound: two left-turn lanes and two through lanes with a shared right turn
Westbound: two left-turn lanes and two through lanes with a shared right turn
Northbound: one left-turn lane, two through lanes, and one right-turn lane
Southbound: one left-turn lane, two through lanes, and one right-turn lane

With implementation of this mitigation the intersection will operate at LOS C during both peak hours. With the exception of the westbound left-turn lanes, 95^{th}-percentile queues in the left-turn lanes will be 227 feet or less and 95^{th}-percentile queues in right-turn lanes will be 95 feet or less. The maximum calculated 95^{th}-percentile queue in the westbound left-turn lanes is 319 feet. Therefore, standard City of Fresno turn lanes are recommended with the exception of the westbound dual left-turn lanes, which should provide a storage length of at least 319 feet. This mitigation is potentially constrained by existing businesses and residences.

Phases 1 through 3 of the Project shall pay the applicable TSMI and FMSI fees to mitigate the Project's fair share of this cumulative impact. The construction of facilities as required in Mitigation E-1 that also satisfy the requirements of Mitigation 2035-3 shall be credited against the fees paid by Phase 3 of the Project.

Impact 2035-4

The Project will contribute to a significant cumulative impact in the long-term condition based on intersection LOS criteria at the intersection of Armstrong and Olive Avenues. The Project will exacerbate a substandard LOS F by more than 5.0 seconds during the a.m. and p.m. peak hours.

Mitigation 2035-4

The intersection of Armstrong and Olive Avenues shall be signalized in accordance with City of Fresno standards including protected left-turn phasing and the following minimum lane configurations:

Eastbound:	one left-turn lane and two through lanes with a shared right turn
Westbound:	one left-turn lane and two through lanes with a shared right turn
Northbound:	one left-turn lane, two through lanes, and one right-turn lane
Southbound:	one left-turn lane, two through lanes, and one right-turn lane

With implementation of this mitigation the intersection will operate at LOS C during both peak hours. With the exception of the eastbound left-turn lane, 95^{th}-percentile queues in the left-turn lanes will be 201 feet or less and 95^{th}-percentile queues in right-turn lanes will be 92 feet or less. The maximum calculated 95^{th}-percentile queue in the eastbound left-turn lane is 308 feet. Therefore, standard City of Fresno turn lanes are recommended with the exception of the eastbound left-turn lane, which should provide a storage length of at least 308 feet.

Phases 1 through 3 of the Project shall pay the applicable TSMI and FMSI fees to mitigate the Project's fair share of this cumulative impact.

Impact 2035-5

The Project will contribute to a significant cumulative impact in the long-term condition based on intersection LOS criteria on Fowler Avenue between Olive and Floradora Avenues. Regional growth, including the proposed Project, will cause the a.m. peak hour LOS to drop from LOS B to LOS E and will cause the p.m. peak hour LOS to drop from LOS C to LOS E.

Mitigation 2035-5

Fowler Avenue between Olive and Floradora Avenues shall be widened to four lanes in accordance with City of Fresno standards. With implementation of this mitigation the road segment will operate at LOS D during both peak hours. This configuration will conform to the City of Fresno General Plan and City of Fresno standards for a four-lane arterial. Phases 1 through 3 of the Project shall pay the applicable FMSI fees to mitigate the Project's fair share of this cumulative impact.

Impact 2035-6

The Project will contribute to a significant cumulative impact in the long-term condition based on intersection LOS criteria on Armstrong Avenue between Olive and Floradora Avenues. Regional growth, including the proposed Project, will cause the LOS to drop from LOS B to LOS E during the a.m. and p.m. peak hours.

Mitigation 2035-6

Armstrong Avenue between Olive and Floradora Avenues shall be widened to four lanes in accordance with City of Fresno standards. With implementation of this mitigation the road segment will operate at LOS C during both peak hours. This configuration will conform to the City of Fresno General Plan and City of Fresno standards for a four-lane collector. Phases 1 through 3 of the Project shall pay the applicable FMSI fees to mitigate the Project's fair share of this cumulative impact.

Impact 2035-7

The Project will contribute to a significant cumulative impact in the long-term condition based on intersection LOS criteria on Olive Avenue between Fowler and Armstrong Avenues. Regional growth, including the proposed Project, will cause the LOS to drop from LOS C to LOS F during the a.m. and p.m. peak hours.

Mitigation 2035-7

Olive Avenue between Fowler and Armstrong Avenues shall be widened to four lanes in accordance with City of Fresno standards. With implementation of this mitigation the road segment will operate at LOS C during both peak hours. This configuration will conform to the City of Fresno General Plan and City of Fresno standards for a four-lane collector. Phases 1 through 3 of the Project shall pay the applicable FMSI fees to mitigate the Project's fair share of this cumulative impact.

14.0 YEAR 2035 WITH-PROJECT CONDITIONS (WITH McKINLEY AVENUE REALIGNMENT)

14.1 Year 2035 With-Project Lane Configurations and Intersection Control

The year 2035 with-Project conditions lane configurations and intersection control with the McKinley Avenue alignment are presented in Figure 5-1.

14.2 Year 2035 With-Project Traffic Volumes

The year 2035 with-Project conditions peak-hour traffic volumes are determined by adding the 2035 baseline traffic volumes and the Project traffic volumes. The year 2035 with-Project conditions peak-hour traffic volumes are presented in Figure 14-1, Year 2035 With-Project A.M. and P.M. Peak Hour Traffic Volumes - McKinley Avenue Realignment.

14.3 Year 2035 With-Project Intersection LOS and Signal Warrant Analysis

The results of the year 2035 with-Project conditions intersection LOS analyses and the peak-hour traffic signal warrants analyses with the McKinley Avenue realignment are summarized in Tables 14.1 and 14.2. Existing-conditions results are also presented in the tables for comparison. Cumulative impacts, if any, are identified in bold type. The intersection analysis sheets are presented in Appendix H and the peak-hour traffic signal warrant analyses are presented in Appendix I.

Table 14.1
A.M. Peak Hour Intersection Analysis Summary – 2035 With-Project Conditions (With McKinley Avenue Realignment)

Intersection	Control	Existing Conditions			2035 With Project Conditions		
		Delay (sec)	LOS	Signal Warrant	Delay (sec)	LOS	Signal Warrant
Fowler / Floradora	OWS	11.5	B	n/a	*****	**F**	2/2
Armstrong / Floradora	TWS	15.6	C	n/a	*****	**F**	2/2
Fowler / Olive	AWS	**39.5**	**E**	2/2	**763.5**	**F**	2/2
Armstrong / Olive	AWS	23.4	C	n/a	**639.1**	**F**	2/2
Site Access / Floradora	DNE	-	-	-	19.7	C	n/a
Site Access / Olive	DNE	-	-	-	30.5	D	n/a

Table 14.2
P.M. Peak Hour Intersection Analysis Summary – 2035 With-Project Conditions (With McKinley Avenue Realignment)

Intersection	Control	Existing Conditions			2035 With Project Conditions		
		Delay (sec)	LOS	Signal Warrant	Delay (sec)	LOS	Signal Warrant
Fowler / Floradora	OWS	20.4	C	n/a	*****	**F**	2/2
Armstrong / Floradora	TWS	11.1	B	n/a	*****	**F**	2/2
Fowler / Olive	AWS	**77.0**	**F**	2/2	**871.0**	**F**	2/2
Armstrong / Olive	AWS	9.4	A	n/a	**557.0**	**F**	2/2
Site Access / Floradora	DNE	-	-	-	20.8	C	n/a
Site Access / Olive	DNE	-	-	-	16.0	C	n/a

The Project significantly contributes to cumulative impacts in the year 2035 conditions based on intersection LOS criteria at the following intersections:

- Fowler Avenue / Floradora Avenue: the Project will exacerbate a substandard LOS F by more than 5.0 seconds during the a.m. and p.m. peak hours, peak hour traffic signal warrants met;
- Armstrong Avenue / Floradora Avenue: the Project will exacerbate a substandard LOS F by more than 5.0 seconds during the a.m. and p.m. peak hours, peak hour traffic signal warrants met;
- Fowler Avenue / Olive Avenue: the Project will exacerbate a substandard LOS F by more than 5.0 seconds during the a.m. and p.m. peak hours, peak hour traffic signal warrants met;
- Armstrong Avenue / Olive Avenue: the Project will exacerbate a substandard LOS F by more than 5.0 seconds during the a.m. and p.m. peak hours, peak hour traffic signal warrants met.

14.4 Year 2035 With-Project Road Segment Analyses

The results of the year 2035 with-Project road segment analyses with the McKinley Avenue realignment are summarized in Tables 14.3 and 14.4. Detailed road segment analyses are presented in Appendix B.

Table 14.3
A.M. Peak Hour Road Segment Analysis Summary – 2035 With-Project Conditions (With McKinley Avenue Realignment)

Road Segment	Existing Conditions		2035 With Project Conditions	
	Volume	LOS	Volume	LOS
Fowler Avenue between Olive and Floradora	693	B	**2,468**	**E**
Armstrong Avenue between Olive and Floradora	488	B	**1,805**	**E**
Olive Avenue between Fowler and Armstrong	666	C	**1,533**	**F**
Floradora Avenue between Fowler and Armstrong	21	C	940	D

Table 14.4
P.M. Peak Hour Road Segment Analysis Summary – 2035 With-Project Conditions (With McKinley Avenue Realignment)

Road Segment	Existing Conditions		2035 With Project Conditions	
	Volume	LOS	Volume	LOS
Fowler Avenue between Olive and Floradora	1,033	C	**2,770**	**E**
Armstrong Avenue between Olive and Floradora	312	B	**1,856**	**E**
Olive Avenue between Fowler and Armstrong	368	C	**1,519**	**F**
Floradora Avenue between Fowler and Armstrong	15	C	1,046	D

The Project significantly contributes to cumulative impacts in the year 2035 conditions based on road segment LOS criteria at the following road segments:

- Fowler Avenue between Olive and Floradora Avenues: regional growth, including the proposed Project, will cause the a.m. peak hour LOS to drop from LOS B to LOS E and will cause the p.m. peak hour LOS to drop from LOS C to LOS E;
- Armstrong Avenue between Olive and Floradora Avenues: regional growth, including the proposed Project, will cause the a.m. peak hour LOS to drop from LOS B to LOS E and will cause the p.m. peak hour LOS to drop from LOS B to LOS E;
- Olive Avenue between Fowler and Armstrong Avenues: regional growth, including the proposed Project, will cause the a.m. peak hour LOS to drop from LOS C to LOS F and will cause the p.m. peak hour LOS to drop from LOS C to LOS F.

14.5 At-Grade Railroad Crossing

The proposed Project is not expected to change the operational characteristics or safety of the existing Olive Avenue railroad crossing at Clovis Avenue, especially considering the low-speed, low-volume nature of the existing rail spur.

14.6 Year 2035 With-Project Conditions (With McKinley Avenue Realignment) Project Impacts and Mitigations

Significant traffic impacts identified in the year 2035 with-Project conditions analyses with the McKinley Avenue realignment are stated below, followed by the recommended mitigation. The mitigated intersection analysis sheets are included in Appendix J and the mitigated road segment analyses are presented in Appendix B.

Impact 2035-1A (McKinley Avenue realigned)

The Project will contribute to a significant cumulative impact in the long-term condition based on intersection LOS criteria at the intersection of Fowler and Floradora (McKinley) Avenues. The Project will exacerbate a substandard LOS F by more than 5.0 seconds during the a.m. and p.m. peak hours.

Mitigation 2035-1A (McKinley Avenue realigned)

The intersection of Fowler and Floradora (McKinley) Avenues shall be signalized in accordance with City of Fresno standards including protected left-turn phasing and the following minimum lane configurations:

Eastbound: one left-turn lane, one through lane, and one right-turn lane
Westbound: two left-turn lanes, one through lane, and one right-turn lane
Northbound: two left-turn lanes, two through lanes, and one right-turn lane
Southbound: one left-turn lane, two through lanes, and one right-turn lane

With implementation of this mitigation the intersection will operate at LOS C during both peak hours. The 95^{th}-percentile queues in the left-turn and right-turn lanes will be 164 feet or less. Therefore, standard City of Fresno turn lanes are recommended.

Phases 1 through 3 of the Project shall pay the applicable TSMI and FMSI fees to mitigate the Project's fair share of this cumulative impact.

Impact 2035-2A (McKinley Avenue realigned)

The Project will contribute to a significant cumulative impact in the long-term condition based on intersection LOS criteria at the intersection of Armstrong and Floradora (McKinley) Avenues. The Project will exacerbate a substandard LOS F by more than 5.0 seconds during the a.m. and p.m. peak hours.

Mitigation 2035-2A (McKinley Avenue realigned)

The intersection of Armstrong and Floradora (McKinley) Avenues shall be signalized in accordance with City of Fresno standards including protected left-turn phasing and the following minimum lane configurations:

Eastbound: one left-turn lane, one through lane, and one right-turn lane
Westbound: one left-turn lane, one through lane, and one right-turn lane
Northbound: one left-turn lane and two through lanes with a shared right turn
Southbound: one left-turn lane and two through lanes with a shared right turn

With implementation of this mitigation the intersection will operate at LOS C during the a.m. peak hour and LOS D during the p.m. peak hour. The 95^{th}-percentile queues in the left-turn and right-turn lanes will be 203 feet or less. Therefore, standard City of Fresno turn lanes are recommended.

Phases 1 through 3 of the Project shall pay the applicable TSMI and FMSI fees to mitigate the Project's fair share of this cumulative impact.

Impact 2035-3A (McKinley Avenue realigned)

The Project will contribute to a significant cumulative impact in the long-term condition based on intersection LOS criteria at the intersection of Fowler and Olive Avenues. The Project will exacerbate a substandard LOS F by more than 5.0 seconds during the a.m. and p.m. peak hours.

Mitigation 2035-3A (McKinley Avenue realigned)

The intersection of Fowler and Olive Avenues shall be signalized in accordance with City of Fresno standards including protected left-turn phasing and the following minimum lane configurations:

Eastbound: two left-turn lanes and two through lanes with a shared right turn
Westbound: two left-turn lanes and two through lanes with a shared right turn
Northbound: one left-turn lane, two through lanes, and one right-turn lane
Southbound: one left-turn lane, two through lanes, and one right-turn lane

With implementation of this mitigation the intersection will operate at LOS C during both peak hours. With the exception of the westbound left-turn lanes, 95^{th}-percentile queues in the left-turn lanes will be 214 feet or less and 95^{th}-percentile queues in right-turn lanes will be 95 feet or less. The maximum calculated 95^{th}-percentile queue in the westbound left-turn lanes is 319 feet. Therefore, standard City of Fresno turn lanes are recommended with the exception of the westbound dual left-turn lanes, which should provide a storage length of at least 319 feet. This mitigation is potentially constrained by existing businesses and residences.

Phases 1 through 3 of the Project shall pay the applicable TSMI and FMSI fees to mitigate the Project's fair share of this cumulative impact. The construction of facilities as required in Mitigation E-1 that also satisfy the requirements of Mitigation 2035-3A shall be credited against the fees paid by Phase 3 of the Project.

Impact 2035-4A (McKinley Avenue realigned)

The Project will contribute to a significant cumulative impact in the long-term condition based on intersection LOS criteria at the intersection of Armstrong and Olive Avenues. The Project will exacerbate a substandard LOS F by more than 5.0 seconds during the a.m. and p.m. peak hours.

Mitigation 2035-4A (McKinley Avenue realigned)

The intersection of Armstrong and Olive Avenues shall be signalized in accordance with City of Fresno standards including protected left-turn phasing and the following minimum lane configurations:

Eastbound: one left-turn lane and two through lanes with a shared right turn
Westbound: one left-turn lane and two through lanes with a shared right turn
Northbound: one left-turn lane, two through lanes, and one right-turn lane
Southbound: one left-turn lane, two through lanes, and one right-turn lane

With implementation of this mitigation the intersection will operate at LOS C during both peak hours. With the exception of the eastbound left-turn lane, 95^{th}-percentile queues in the left-turn lanes will be 187 feet or less and 95^{th}-percentile queues in right-turn lanes will be 89 feet or less. The maximum calculated 95^{th}-percentile queue in the eastbound left-turn lane is 319 feet. Therefore, standard City of Fresno turn lanes are recommended with the exception of the eastbound left-turn lane, which should provide a storage length of at least 319 feet.

Phases 1 through 3 of the Project shall pay the applicable TSMI and FMSI fees to mitigate the Project's fair share of this cumulative impact.

Impact 2035-5A

The Project will contribute to a significant cumulative impact in the long-term condition based on intersection LOS criteria on Fowler Avenue between Olive and Floradora Avenues. Regional growth, including the proposed Project, will cause the a.m. peak hour LOS to drop from LOS B to LOS E and will cause the p.m. peak hour LOS to drop from LOS C to LOS E.

Mitigation 2035-5A (McKinley Avenue realigned)

Fowler Avenue between Olive and Floradora Avenues shall be widened to four lanes in accordance with City of Fresno standards. With implementation of this mitigation the road segment will operate at LOS D during both peak hours. This configuration will conform to the City of Fresno General Plan and City of Fresno standards for a four-lane arterial. Phases 1 through 3 of the Project shall pay the applicable FMSI fees to mitigate the Project's fair share of this cumulative impact.

Impact 2035-6A (McKinley Avenue realigned)

The Project will contribute to a significant cumulative impact in the long-term condition based on intersection LOS criteria on Armstrong Avenue between Olive and Floradora Avenues. Regional growth, including the proposed Project, will cause the LOS to drop from LOS B to LOS E during the a.m. and p.m. peak hours.

Mitigation 2035-6A (McKinley Avenue realigned)

Armstrong Avenue between Olive and Floradora Avenues shall be widened to four lanes in accordance with City of Fresno standards. With implementation of this mitigation the road segment will operate at LOS C during both peak hours. This configuration will conform to the City of Fresno General Plan and City of Fresno standards for a four-lane collector. Phases 1 through 3 of the Project shall pay the applicable FMSI fees to mitigate the Project's fair share of this cumulative impact.

Impact 2035-7A (McKinley Avenue realigned)

The Project will contribute to a significant cumulative impact in the long-term condition based on intersection LOS criteria on Olive Avenue between Fowler and Armstrong Avenues. Regional growth, including the proposed Project, will cause the LOS to drop from LOS C to LOS F during the a.m. and p.m. peak hours.

Mitigation 2035-7A (McKinley Avenue realigned)

Olive Avenue between Fowler and Armstrong Avenues shall be widened to four lanes in accordance with City of Fresno standards. With implementation of this mitigation the road segment will operate at LOS C during both peak hours. This configuration will conform to the City of Fresno General Plan and City of Fresno standards for a four-lane collector. Phases 1 through 3 of the Project shall pay the applicable FMSI fees to mitigate the Project's fair share of this cumulative impact.

15.0 SITE ACCESS AND CIRCULATION

Site access was evaluated for each analysis scenario in the intersection analysis sections of this report. Site access intersections are expected to operate at acceptable levels of service.

On-site plans have not yet been developed; on-site circulation shall be analyzed during development of on-site plans and the site plan review process. Line of sight and turning radii shall be sufficient to provide for maneuvering by trucks and passenger vehicles. The site plan shall consider sight distances, emergency vehicle access, delivery truck access, and minimizing conflicts between employee vehicles, visitor vehicles and busses, and City vehicles.

16.0 CONCLUSIONS AND SUMMARY OF IMPACTS AND MITIGATIONS

Generally-accepted traffic engineering principles and methods were employed to estimate the amount of traffic expected to be generated by the Project and to analyze the traffic conditions expected to occur in the future. The traffic impact study concludes that substandard conditions are expected to occur at several of the study intersections and road segments without the Project as development progresses in the Fresno area. The Project is expected to cause or contribute to significant impacts at the roadway segments and intersections studied.

The Project will be required to mitigate the significant impacts as described herein and summarized in Table 16.1. The Project is required to construct the mitigations that are identified based on the existing-plus-Project scenarios. The Project is required to contribute its fair share of mitigations identified in the cumulative (near-term and year 2035) scenarios with payment of the applicable City of Fresno TSMI and FMSI fees. The cost of facilities constructed by the Project that are within the TSMI and FMSI programs shall be credited against the required fee.

Existing-Plus-Project Phases 1 and 2

The Existing Plus Project Phases 1 and 2 analyses indicate that Phases 1 and 2 of the Project will not create significant impacts.

Existing-Plus-Project Phases 1 Through 3

The following impact and associated mitigation are based on Existing Plus Project Phases 1 Through 3 conditions. The mitigation shall be constructed by the Project prior to the opening of Phase 3. The cost of the mitigation shall be credited against the TSMI and FMSI fees and the Project will be eligible for reimbursement of costs in excess of the Project's required fees.

Impact E-1

At the intersection of Fowler and Olive Avenues, after construction of Phases 1 and 2 of the Project, Phase 3 of the Project will cause the a.m. peak hour LOS to drop from LOS E to LOS F and will exacerbate a substandard LOS F by more than 5.0 seconds during the p.m. peak hour.

Mitigation E-1

Phase 3 of the Project shall construct this mitigation. The intersection of Fowler and Olive Avenues shall be signalized in accordance with City of Fresno standards including protected left-turn phasing and the following minimum lane configurations:

Eastbound: one left-turn lane and a shared through/right-turn lane
Westbound: two left-turn lanes and a shared through/right-turn lane
Northbound: one left-turn lane and a shared through/right-turn lane
Southbound: one left-turn lane and a shared through/right-turn lane

With implementation of this mitigation the intersection will operate at LOS C and 95th-percentile queues in the left-turn and right-turn lanes will be 219 feet or less. Therefore, standard City of Fresno turn lanes are recommended.

This mitigation is potentially constrained by existing businesses and residences.

Near-Term With-Project Phases 1 and 2

The following cumulative impacts and the associated mitigations are based on Near-Term With-Project Phases 1 and 2 conditions. The Project shall mitigate its share of the cumulative impacts with payment of the City of Fresno TSMI and FMSI fees.

Impact NT2-1

Phases 1 and 2 of the Project contribute to a significant cumulative impact in the near-term condition based on intersection LOS criteria at the intersection of Fowler and Olive Avenues. The cumulative projects will cause the a.m. peak hour LOS to drop from LOS E to LOS F and will exacerbate a substandard LOS F by more than 5.0 seconds during the p.m. peak hour.

Mitigation NT2-1

The intersection of Fowler and Olive Avenues shall be signalized in accordance with City of Fresno standards including protected left-turn phasing and the following minimum lane configurations:

Eastbound:	one left-turn lane and a shared through/right-turn lane
Westbound:	two left-turn lanes and a shared through/right-turn lane
Northbound:	one left-turn lane and a shared through/right-turn lane
Southbound:	one left-turn lane and a shared through/right-turn lane

With implementation of this mitigation the intersection will operate at LOS C and 95th-percentile queues in the left-turn and right-turn lanes will be 189 feet or less. Therefore, standard City of Fresno turn lanes are recommended.

This mitigation is potentially constrained by existing businesses and residences.

Phases 1 and 2 of the Project shall pay the applicable TSMI and FMSI fees to mitigate the Project's fair share of this cumulative impact.

Impact NT2-2

Phases 1 and 2 of the Project contribute to a significant cumulative impact in the near-term condition based on road segment LOS criteria on Fowler Avenue between Olive and Floradora Avenues. The cumulative projects will cause the p.m. peak hour LOS to drop from LOS C to LOS E.

Mitigation NT2-2

Fowler Avenue between Olive and Floradora Avenues shall be widened to four lanes with a median per City of Fresno standards. In order to effectively utilize the additional lanes, the widening project shall extend south of Olive Avenue to match the existing four-lane section of Fowler Avenue. With implementation of this mitigation Fowler Avenue will operate at LOS B during the peak hours.

This mitigation is potentially constrained by existing businesses and residences.

Phases 1 and 2 of the Project shall pay the applicable FMSI fee to mitigate the Project's fair share of this cumulative impact.

Near-Term With-Project Phases 1 Through 3

The following cumulative impacts and the associated mitigations are based on Near-Term With-Project Phases 1 through 3 conditions. The Project shall mitigate its share of the cumulative impacts with payment of the City of Fresno TSMI and FMSI fees.

Impact NT3-1

Phases 1 through 3 of the Project contribute to a significant cumulative impact in the near-term condition based on intersection LOS criteria at the intersection of Fowler and Floradora Avenues. The cumulative projects will cause a substandard p.m. peak hour LOS E.

Mitigation NT3-1

The intersection of Fowler and Floradora (future McKinley) Avenues shall be widened in accordance with City of Fresno standards with two-way stop-control and the following minimum lane configurations:

Eastbound: does not exist
Westbound: one shared left-turn/right-turn lane
Northbound: two through lanes with a shared right turn
Southbound: one left-turn lane and two through lanes

With implementation of this mitigation the intersection will operate at LOS B during the a.m. peak hour and LOS C during the p.m. peak hour. This mitigation is potentially constrained by existing businesses and residences.

Phases 1 through 3 of the Project shall pay the applicable TSMI and FMSI fees to mitigate the Project's fair share of this cumulative impact.

Impact NT3-2

Phases 1 through 3 of the Project contribute to a significant cumulative impact in the near-term condition based on intersection LOS criteria at the intersection of Fowler and Olive Avenues. The cumulative projects will cause the a.m. peak hour LOS to drop from LOS E to LOS F and will exacerbate a substandard LOS F by more than 5.0 seconds during the p.m. peak hour.

Mitigation NT3-2

The intersection of Fowler and Olive Avenues shall be signalized in accordance with City of Fresno standards including protected left-turn phasing and the following minimum lane configurations:

Eastbound: one left-turn lane and a shared through/right-turn lane
Westbound: two left-turn lanes and a shared through/right-turn lane
Northbound: one left-turn lane and two through lanes with a shared right turn
Southbound: one left-turn lane and two through lanes with a shared right turn

With implementation of this mitigation the intersection will operate at LOS C and 95th-percentile queues in the left-turn and right-turn lanes will be 196 feet or less. Therefore, standard City of Fresno turn lanes are recommended. This mitigation is potentially constrained by existing businesses and residences.

Phases 1 through 3 of the Project shall pay the applicable TSMI and FMSI fees to mitigate the Project's fair share of this cumulative impact. The construction of facilities as required in Mitigation E-1 that also satisfy the requirements of Mitigation NT3-2 shall be credited against the fees paid by Phase 3 of the Project.

Impact NT3-3

Phases 1 through 3 of the Project contribute to a significant cumulative impact in the near-term condition based on intersection LOS criteria at the intersection of Armstrong and Olive Avenues. The cumulative projects will cause a substandard a.m. peak hour LOS E.

Mitigation NT3-3

The intersection of Armstrong and Olive Avenues shall be signalized in accordance with City of Fresno standards including protected left-turn phasing and the following minimum lane configurations:

Eastbound: one left-turn lane and a shared through/right-turn lane
Westbound: one left-turn lane and a shared through/right-turn lane
Northbound: one left-turn lane and a shared through/right-turn lane
Southbound: one left-turn lane and a shared through/right-turn lane

With implementation of this mitigation the intersection will operate at LOS C during the a.m. peak hour and LOS B during the p.m. peak hour; 95^{th}-percentile queues in the left-turn and right-turn lanes will be 95 feet or less. Therefore, standard City of Fresno turn lanes are recommended.

Phases 1 through 3 of the Project shall pay the applicable TSMI and FMSI fees to mitigate the Project's fair share of this cumulative impact.

Impact NT3-4

Phases 1 through 3 of the Project contribute to a significant cumulative impact in the near-term condition based on road segment LOS criteria on Fowler Avenue between Olive and Floradora Avenues. The cumulative projects will cause the p.m. peak hour LOS to drop from LOS C to LOS E.

Mitigation NT3-4

This mitigation is identical to Mitigation NT2-2. Fowler Avenue between Olive and Floradora Avenues shall be widened to four lanes with a median per City of Fresno standards. In order to effectively utilize the additional lanes, the widening project shall extend south of Olive Avenue to match the existing four-lane section of Fowler Avenue. With implementation of this mitigation Fowler Avenue will operate at LOS B during the peak hours.

This mitigation is potentially constrained by existing businesses and residences.

Phases 1 through 3 of the Project shall pay the applicable FMSI fee to mitigate the Project's fair share of this cumulative impact.

Year 2035 With-Project (Without McKinley Avenue Realignment)

The following cumulative impacts and associated mitigations are based on the Long-Term With-Project conditions assuming that McKinley Avenue is not realigned to the Floradora Avenue alignment. The Project shall mitigate its fair share of the required mitigations with payment into the City of Fresno TSMI and FMSI fee programs. The cost of any facilities constructed in the ultimate location as a result of a near-term mitigation measure shall be credited against the required fees.

Impact 2035-1

The Project will contribute to a significant cumulative impact in the long-term condition based on intersection LOS criteria at the intersection of Fowler and Floradora Avenues. The Project will cause the a.m. peak hour LOS to drop from LOS E to LOS F and will exacerbate a substandard LOS F by more than 5.0 seconds during the p.m. peak hour.

Mitigation 2035-1

All-way stop control will not provide acceptable levels of service and the installation of traffic signals is not a feasible mitigation since peak-hour traffic signal warrants are not satisfied. The intersection of Fowler and Floradora Avenues shall be widened in accordance with City of Fresno standards with two-way stop-control and the following minimum lane configurations:

Eastbound:	one shared left-turn/right-turn lane
Westbound:	does not exist
Northbound:	two through lanes with a shared right turn
Southbound:	one left-turn lane and two through lanes

With implementation of this mitigation the westbound approach to the intersection will operate at LOS F during both peak hours and the impact will remain significant.

Phases 1 through 3 of the Project shall pay the applicable FMSI fee for road improvements to mitigate the Project's fair share of this cumulative impact.

Impact 2035-2

The Project will contribute to a significant cumulative impact in the long-term condition based on intersection LOS criteria at the intersection of Armstrong and Floradora Avenues. The Project will exacerbate a substandard LOS F by more than 5.0 seconds during the a.m. and p.m. peak hours.

Mitigation 2035-2

All-way stop control will not provide acceptable levels of service and the installation of traffic signals is not a feasible mitigation since peak-hour traffic signal warrants are not satisfied. The intersection of Armstrong and Floradora Avenues shall be widened in accordance with City of Fresno standards with two-way stop-control and the following minimum lane configurations:

Eastbound: one shared left-turn/through/right-turn lane
Westbound: one shared left-turn/through/right-turn lane
Northbound: one left-turn lane and two through lanes with a shared right turn
Southbound: one left-turn lane and two through lanes with a shared right turn

With implementation of this mitigation the eastbound and westbound approaches to the intersection will operate at LOS F during both peak hours and the impact will remain significant.

Phases 1 through 3 of the Project shall pay the applicable FMSI fee for road improvements to mitigate the Project's fair share of this cumulative impact.

Impact 2035-3

The Project will contribute to a significant cumulative impact in the long-term condition based on intersection LOS criteria at the intersection of Fowler and Olive Avenues. The Project will exacerbate a substandard LOS F by more than 5.0 seconds during the a.m. and p.m. peak hours.

Mitigation 2035-3

The intersection of Fowler and Olive Avenues shall be signalized in accordance with City of Fresno standards including protected left-turn phasing and the following minimum lane configurations:

Eastbound: two left-turn lanes and two through lanes with a shared right turn
Westbound: two left-turn lanes and two through lanes with a shared right turn
Northbound: one left-turn lane, two through lanes, and one right-turn lane
Southbound: one left-turn lane, two through lanes, and one right-turn lane

With implementation of this mitigation the intersection will operate at LOS C during both peak hours. With the exception of the westbound left-turn lanes, 95^{th}-percentile queues in the left-turn lanes will be 227 feet or less and 95^{th}-percentile queues in right-turn lanes will be 95 feet or less. The maximum calculated 95^{th}-percentile queue in the westbound left-turn lanes is 319 feet. Therefore, standard City of Fresno turn lanes are recommended with the exception of the westbound dual left-turn lanes, which should provide a storage length of at least 325 feet. This mitigation is potentially constrained by existing businesses and residences.

Phases 1 through 3 of the Project shall pay the applicable TSMI and FMSI fees to mitigate the Project's fair share of this cumulative impact. The construction of facilities as required in Mitigation E-1 that also satisfy the requirements of Mitigation 2035-3 shall be credited against the fees paid by Phase 3 of the Project.

Impact 2035-4

The Project will contribute to a significant cumulative impact in the long-term condition based on intersection LOS criteria at the intersection of Armstrong and Olive Avenues. The Project will exacerbate a substandard LOS F by more than 5.0 seconds during the a.m. and p.m. peak hours.

Mitigation 2035-4

The intersection of Armstrong and Olive Avenues shall be signalized in accordance with City of Fresno standards including protected left-turn phasing and the following minimum lane configurations:

Eastbound: one left-turn lane and two through lanes with a shared right turn
Westbound: one left-turn lane and two through lanes with a shared right turn
Northbound: one left-turn lane, two through lanes, and one right-turn lane
Southbound: one left-turn lane, two through lanes, and one right-turn lane

With implementation of this mitigation the intersection will operate at LOS C during both peak hours. With the exception of the eastbound left-turn lane, 95th-percentile queues in the left-turn lanes will be 201 feet or less and 95th-percentile queues in right-turn lanes will be 92 feet or less. The maximum calculated 95th-percentile queue in the eastbound left-turn lane is 308 feet. Therefore, standard City of Fresno turn lanes are recommended with the exception of the westbound left-turn lane, which should provide a storage length of at least 308 feet.

Phases 1 through 3 of the Project shall pay the applicable TSMI and FMSI fees to mitigate the Project's fair share of this cumulative impact.

Impact 2035-5

The Project will contribute to a significant cumulative impact in the long-term condition based on intersection LOS criteria on Fowler Avenue between Olive and Floradora Avenues. Regional growth, including the proposed Project, will cause the a.m. peak hour LOS to drop from LOS B to LOS E and will cause the p.m. peak hour LOS to drop from LOS C to LOS E.

Mitigation 2035-5

Fowler Avenue between Olive and Floradora Avenues shall be widened to four lanes in accordance with City of Fresno standards. With implementation of this mitigation the road segment will operate at LOS D during both peak hours. This configuration will conform to the City of Fresno General Plan and City of Fresno standards for a four-lane arterial. Phases 1 through 3 of the Project shall pay the applicable FMSI fees to mitigate the Project's fair share of this cumulative impact.

Impact 2035-6

The Project will contribute to a significant cumulative impact in the long-term condition based on intersection LOS criteria on Armstrong Avenue between Olive and Floradora Avenues. Regional growth, including the proposed Project, will cause the LOS to drop from LOS B to LOS E during the a.m. and p.m. peak hours.

Mitigation 2035-6

Armstrong Avenue between Olive and Floradora Avenues shall be widened to four lanes in accordance with City of Fresno standards. With implementation of this mitigation the road segment will operate at LOS C during both peak hours. This configuration will conform to the City of Fresno General Plan and City of Fresno standards for a four-lane collector. Phases 1 through 3 of the Project shall pay the applicable FMSI fees to mitigate the Project's fair share of this cumulative impact.

Impact 2035-7

The Project will contribute to a significant cumulative impact in the long-term condition based on intersection LOS criteria on Olive Avenue between Fowler and Armstrong Avenues. Regional growth, including the proposed Project, will cause the LOS to drop from LOS C to LOS F during the a.m. and p.m. peak hours.

Mitigation 2035-7

Olive Avenue between Fowler and Armstrong Avenues shall be widened to four lanes in accordance with City of Fresno standards. With implementation of this mitigation the road segment will operate at LOS C during both peak hours. This configuration will conform to the City of Fresno General Plan and City of Fresno standards for a four-lane collector. Phases 1 through 3 of the Project shall pay the applicable FMSI fees to mitigate the Project's fair share of this cumulative impact.

Year 2035 With-Project (With McKinley Avenue Realignment)

The following cumulative impacts and associated mitigations are based on Long-Term With-Project conditions assuming that McKinley Avenue is realigned to the Floradora Avenue alignment. The Project shall mitigate its fair share of the required mitigations with payment into the City of Fresno TSMI and FMSI fee programs. The cost of any facilities constructed in the ultimate location as a result of a near-term mitigation measure shall be credited against the required fees.

Impact 2035-1A (McKinley Avenue realigned)

The Project will contribute to a significant cumulative impact in the long-term condition based on intersection LOS criteria at the intersection of Fowler and Floradora (McKinley) Avenues. The Project will exacerbate a substandard LOS F by more than 5.0 seconds during the a.m. and p.m. peak hours.

Mitigation 2035-1A (McKinley Avenue realigned)

The intersection of Fowler and Floradora (McKinley) Avenues shall be signalized in accordance with City of Fresno standards including protected left-turn phasing and the following minimum lane configurations:

Eastbound: one left-turn lane, one through lane, and one right-turn lane
Westbound: two left-turn lanes, one through lane, and one right-turn lane
Northbound: two left-turn lanes, two through lanes, and one right-turn lane
Southbound: one left-turn lane, two through lanes, and one right-turn lane

With implementation of this mitigation the intersection will operate at LOS C during both peak hours. The 95^{th}-percentile queues in the left-turn and right-turn lanes will be 164 feet or less. Therefore, standard City of Fresno turn lanes are recommended.

Phases 1 through 3 of the Project shall pay the applicable TSMI and FMSI fees to mitigate the Project's fair share of this cumulative impact.

Impact 2035-2A (McKinley Avenue realigned)

The Project will contribute to a significant cumulative impact in the long-term condition based on intersection LOS criteria at the intersection of Armstrong and Floradora (McKinley) Avenues. The Project will exacerbate a substandard LOS F by more than 5.0 seconds during the a.m. and p.m. peak hours.

Mitigation 2035-2A (McKinley Avenue realigned)

The intersection of Armstrong and Floradora (McKinley) Avenues shall be signalized in accordance with City of Fresno standards including protected left-turn phasing and the following minimum lane configurations:

Eastbound: one left-turn lane, one through lane, and one right-turn lane
Westbound: one left-turn lane, one through lane, and one right-turn lane
Northbound: one left-turn lane and two through lanes with a shared right turn
Southbound: one left-turn lane and two through lanes with a shared right turn

With implementation of this mitigation the intersection will operate at LOS C during the a.m. peak hour and LOS D during the p.m. peak hour. The 95^{th}-percentile queues in the left-turn and right-turn lanes will be 203 feet or less. Therefore, standard City of Fresno turn lanes are recommended.

Phases 1 through 3 of the Project shall pay the applicable TSMI and FMSI fees to mitigate the Project's fair share of this cumulative impact.

Impact 2035-3A (McKinley Avenue realigned)

The Project will contribute to a significant cumulative impact in the long-term condition based on intersection LOS criteria at the intersection of Fowler and Olive Avenues. The Project will exacerbate a substandard LOS F by more than 5.0 seconds during the a.m. and p.m. peak hours.

Mitigation 2035-3A (McKinley Avenue realigned)

The intersection of Fowler and Olive Avenues shall be signalized in accordance with City of Fresno standards including protected left-turn phasing and the following minimum lane configurations:

Eastbound: two left-turn lanes and two through lanes with a shared right turn
Westbound: two left-turn lanes and two through lanes with a shared right turn
Northbound: one left-turn lane, two through lanes, and one right-turn lane
Southbound: one left-turn lane, two through lanes, and one right-turn lane

With implementation of this mitigation the intersection will operate at LOS C during both peak hours. With the exception of the westbound left-turn lanes, 95th-percentile queues in the left-turn lanes will be 214 feet or less and 95th-percentile queues in right-turn lanes will be 95 feet or less. The maximum calculated 95th-percentile queue in the westbound left-turn lanes is 319 feet. Therefore, standard City of Fresno turn lanes are recommended with the exception of the westbound dual left-turn lanes, which should provide a storage length of at least 319 feet. This mitigation is potentially constrained by existing businesses and residences.

Phases 1 through 3 of the Project shall pay the applicable TSMI and FMSI fees to mitigate the Project's fair share of this cumulative impact. The construction of facilities as required in Mitigation E-1 that also satisfy the requirements of Mitigation 2035-3A shall be credited against the fees paid by Phase 3 of the Project.

Impact 2035-4A (McKinley Avenue realigned)

The Project will contribute to a significant cumulative impact in the long-term condition based on intersection LOS criteria at the intersection of Armstrong and Olive Avenues. The Project will exacerbate a substandard LOS F by more than 5.0 seconds during the a.m. and p.m. peak hours.

Mitigation 2035-4A (McKinley Avenue realigned)

The intersection of Armstrong and Olive Avenues shall be signalized in accordance with City of Fresno standards including protected left-turn phasing and the following minimum lane configurations:

Eastbound: one left-turn lane and two through lanes with a shared right turn
Westbound: one left-turn lane and two through lanes with a shared right turn
Northbound: one left-turn lane, two through lanes, and one right-turn lane
Southbound: one left-turn lane, two through lanes, and one right-turn lane

With implementation of this mitigation the intersection will operate at LOS C during both peak hours. With the exception of the eastbound left-turn lane, 95th-percentile queues in the left-turn lanes will be 187 feet or less and 95th-percentile queues in right-turn lanes will be 89 feet or less. The maximum calculated 95th-percentile queue in the eastbound left-turn lane is 319 feet. Therefore, standard City of Fresno turn lanes are recommended with the exception of the eastbound left-turn lane, which should provide a storage length of at least 319 feet.

Phases 1 through 3 of the Project shall pay the applicable TSMI and FMSI fees to mitigate the Project's fair share of this cumulative impact.

Impact 2035-5A (McKinley Avenue realigned)

The Project will contribute to a significant cumulative impact in the long-term condition based on intersection LOS criteria on Fowler Avenue between Olive and Floradora Avenues. Regional growth, including the proposed Project, will cause the a.m. peak hour LOS to drop from LOS B to LOS E and will cause the p.m. peak hour LOS to drop from LOS C to LOS E.

Mitigation 2035-5A (McKinley Avenue realigned)

Fowler Avenue between Olive and Floradora Avenues shall be widened to four lanes in accordance with City of Fresno standards. With implementation of this mitigation the road segment will operate at LOS D during both peak hours. This configuration will conform to the City of Fresno General Plan and City of Fresno standards for a four-lane arterial. Phases 1 through 3 of the Project shall pay the applicable FMSI fees to mitigate the Project's fair share of this cumulative impact.

Impact 2035-6A (McKinley Avenue realigned)

The Project will contribute to a significant cumulative impact in the long-term condition based on intersection LOS criteria on Armstrong Avenue between Olive and Floradora Avenues. Regional growth, including the proposed Project, will cause the LOS to drop from LOS B to LOS E during the a.m. and p.m. peak hours.

Mitigation 2035-6A (McKinley Avenue realigned)

Armstrong Avenue between Olive and Floradora Avenues shall be widened to four lanes in accordance with City of Fresno standards. With implementation of this mitigation the road segment will operate at LOS C during both peak hours. This configuration will conform to the City of Fresno General Plan and City of Fresno standards for a four-lane collector. Phases 1 through 3 of the Project shall pay the applicable FMSI fees to mitigate the Project's fair share of this cumulative impact.

Impact 2035-7A (McKinley Avenue realigned)

The Project will contribute to a significant cumulative impact in the long-term condition based on intersection LOS criteria on Olive Avenue between Fowler and Armstrong Avenues. Regional growth, including the proposed Project, will cause the LOS to drop from LOS C to LOS F during the a.m. and p.m. peak hours.

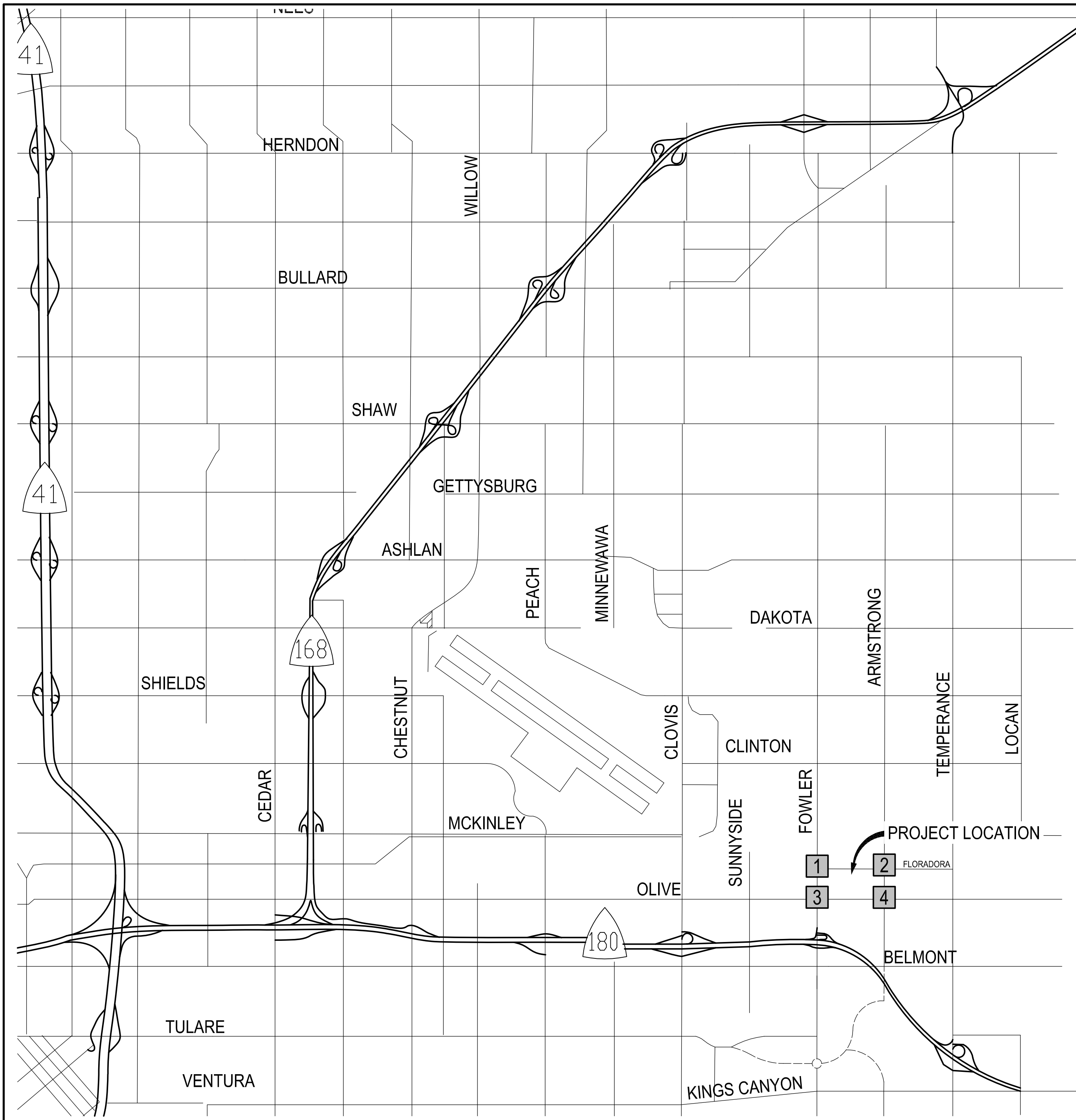
Mitigation 2035-7A (McKinley Avenue realigned)

Olive Avenue between Fowler and Armstrong Avenues shall be widened to four lanes in accordance with City of Fresno standards. With implementation of this mitigation the road segment will operate at LOS C during both peak hours. This configuration will conform to the City of Fresno General Plan and City of Fresno standards for a four-lane collector. Phases 1 through 3 of the Project shall pay the applicable FMSI fees to mitigate the Project's fair share of this cumulative impact.

Table 16.1
Impact and Mitigation Summary

Location	Impact	Mitigation		
		Phase 1	Phase 2	Phase 3
Fowler / Floradora	NT3-1	TSMI and FMSI Fees	TSMI and FMSI Fees	TSMI and FMSI Fees
	2035-1	FMSI Fee	FMSI Fee	FMSI Fee
	2035-1A	TSMI and FMSI Fees	TSMI and FMSI Fees	TSMI and FMSI Fees
Armstrong / Floradora	2035-2	FMSI Fee	FMSI Fee	FMSI Fee
	2035-2A	TSMI and FMSI Fees	TSMI and FMSI Fees	TSMI and FMSI Fees
Fowler / Olive	E-1	None	None	Construct traffic signals and intersection widening (Potentially constrained)
	NT2-1	TSMI and FMSI Fees	TSMI and FMSI Fees	None
	NT3-2	TSMI and FMSI Fees	TSMI and FMSI Fees	TSMI and FMSI Fees
	2035-3	TSMI and FMSI Fees	TSMI and FMSI Fees	TSMI and FMSI Fees
	2035-3A	TSMI and FMSI Fees	TSMI and FMSI Fees	TSMI and FMSI Fees
Armstrong / Olive	NT3-3	TSMI and FMSI Fees	TSMI and FMSI Fees	TSMI and FMSI Fees
	2035-4	TSMI and FMSI Fees	TSMI and FMSI Fees	TSMI and FMSI Fees
	2035-4A	TSMI and FMSI Fees	TSMI and FMSI Fees	TSMI and FMSI Fees
Site Access / Floradora	None	None	None	None
Site Access / Olive	None	None	None	None
Fowler Avenue: Olive to Floradora	NT2-2	FMSI Fee	FMSI Fee	None
	NT3-4	FMSI Fee	FMSI Fee	FMSI Fee
	2035-5	FMSI Fee	FMSI Fee	FMSI Fee
	2035-5A	FMSI Fee	FMSI Fee	FMSI Fee
Armstrong Avenue: Olive to Floradora	2035-6	FMSI Fee	FMSI Fee	FMSI Fee
	2035-6A	FMSI Fee	FMSI Fee	FMSI Fee
Olive Avenue: Fowler to Armstrong	2035-7	FMSI Fee	FMSI Fee	FMSI Fee
	2035-7A	FMSI Fee	FMSI Fee	FMSI Fee
Floradora Avenue: Fowler to Armstrong	None	None	None	None

FIGURES



LEGEND

X STUDY AREA INTERSECTIONS

SITE VICINITY MAP

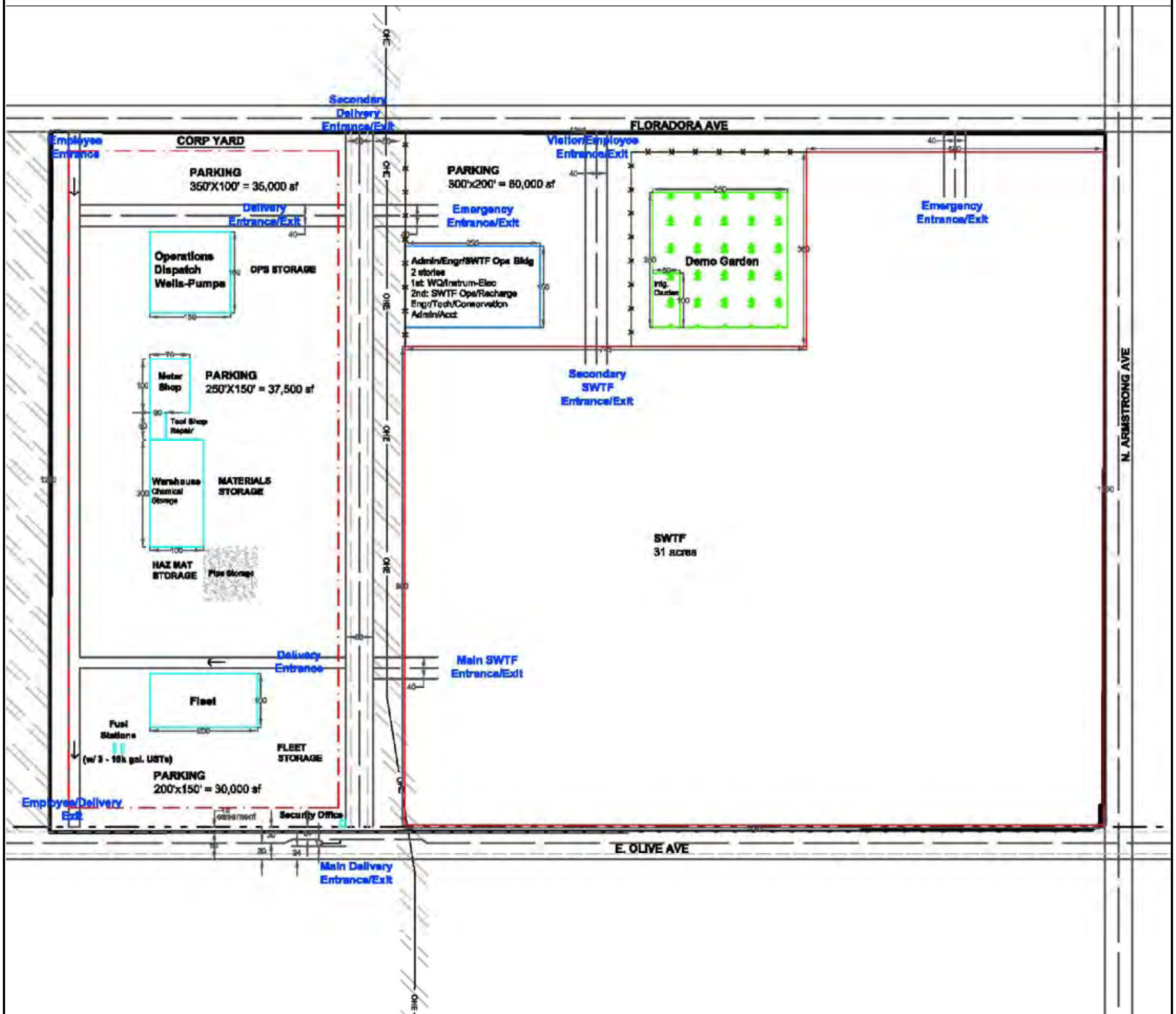
Proposed City of Fresno Southeast Surface Water Treatment Facility

Fresno, California

Not to Scale

PETERS ENGINEERING GROUP

Figure 1-1



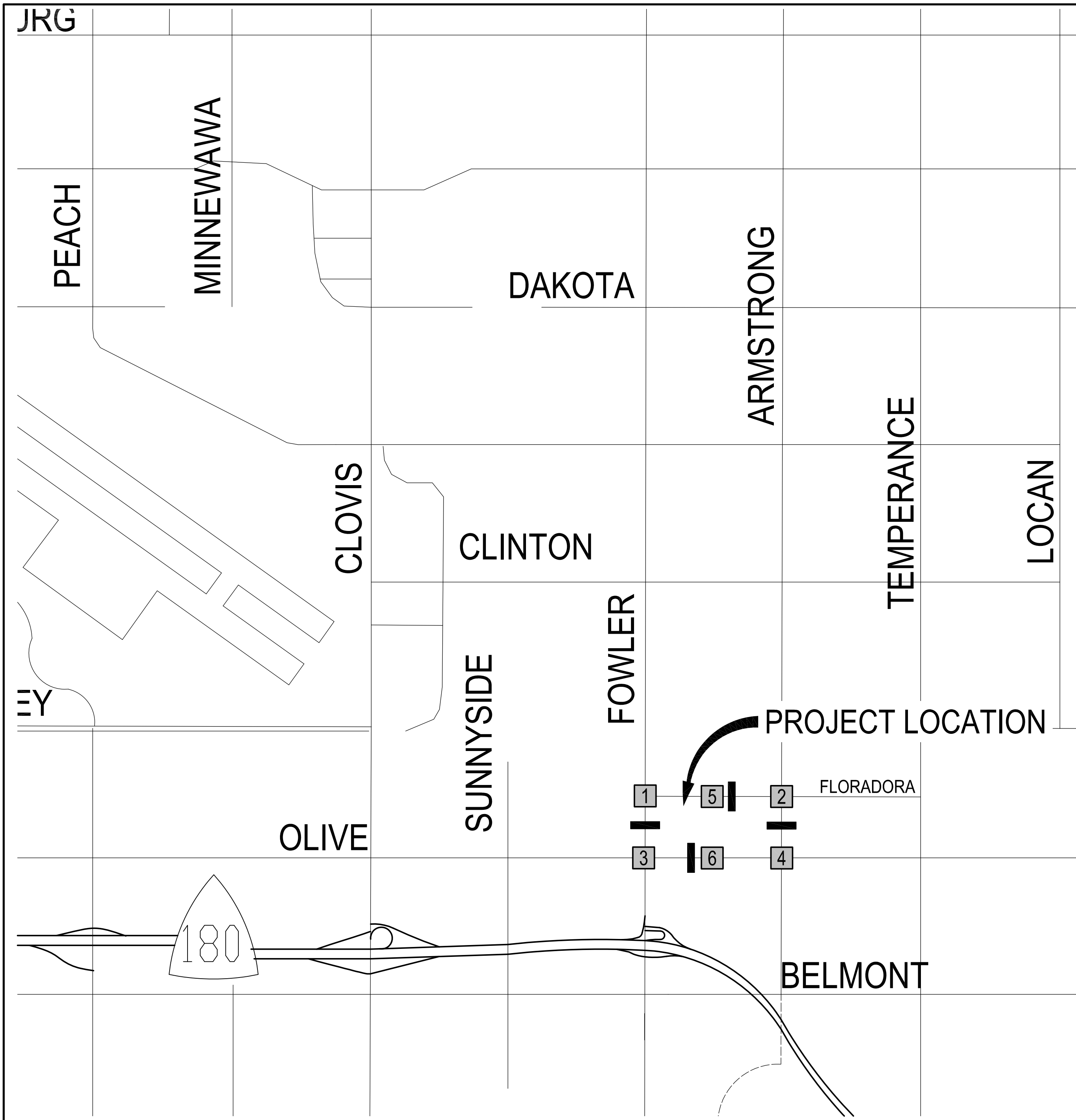
CONCEPTUAL SITE PLAN

Proposed City of Fresno Southeast Surface Water Treatment Facility

Fresno, California

PETERS ENGINEERING GROUP

Figure 1-2



LEGEND

X STUDY AREA INTERSECTIONS

STUDY ROAD SEGMENTS

STUDY INTERSECTIONS AND ROAD SEGMENTS

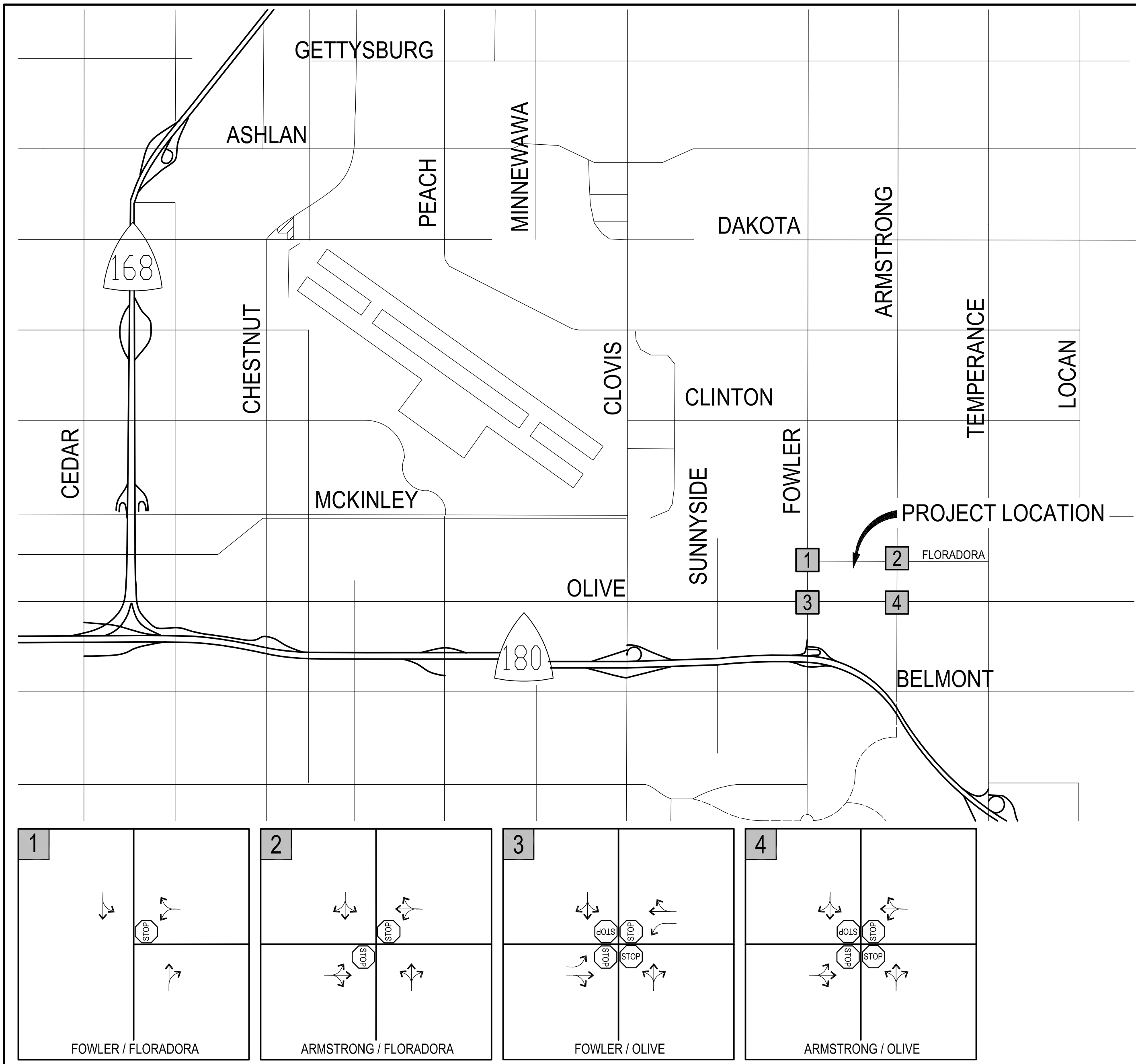
Proposed City of Fresno Southeast Surface Water Treatment Facility

Fresno, California

Not to Scale

PE PETERS ENGINEERING GROUP

Figure 1-3



LEGEND

SIGNALIZED INTERSECTION

STOP SIGN

DIRECTION OF TRAVEL

X STUDY AREA INTERSECTIONS

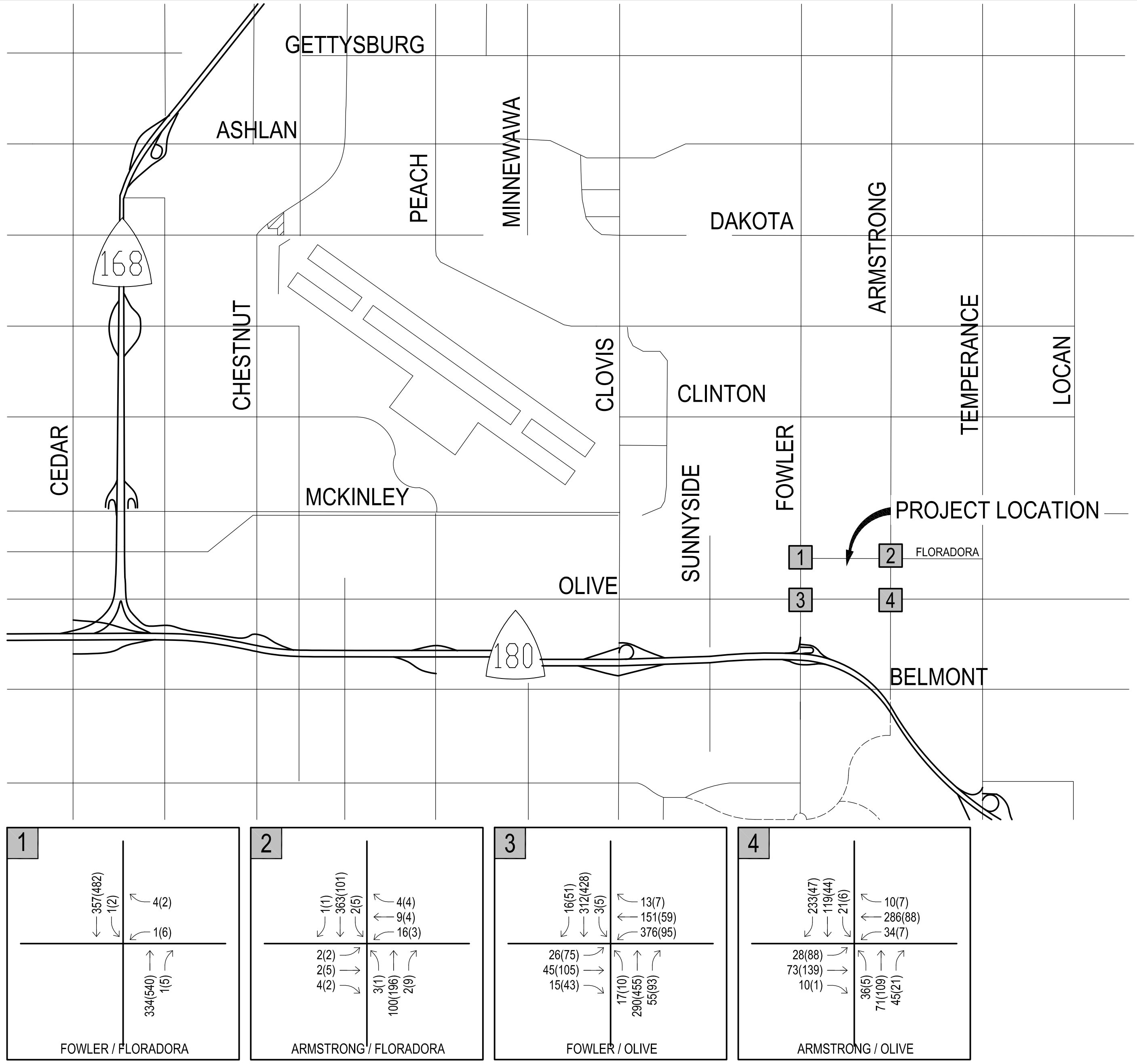
EXISTING LANE CONFIGURATIONS AND INTERSECTION CONTROL

Proposed City of Fresno Southeast Surface Water Treatment Facility

Fresno, California

Not to Scale

PETERS ENGINEERING GROUP



LEGEND

X	STUDY AREA INTERSECTIONS
XX (YY)	AM (PM) VOLUMES

EXISTING PEAK-HOUR TRAFFIC VOLUMES

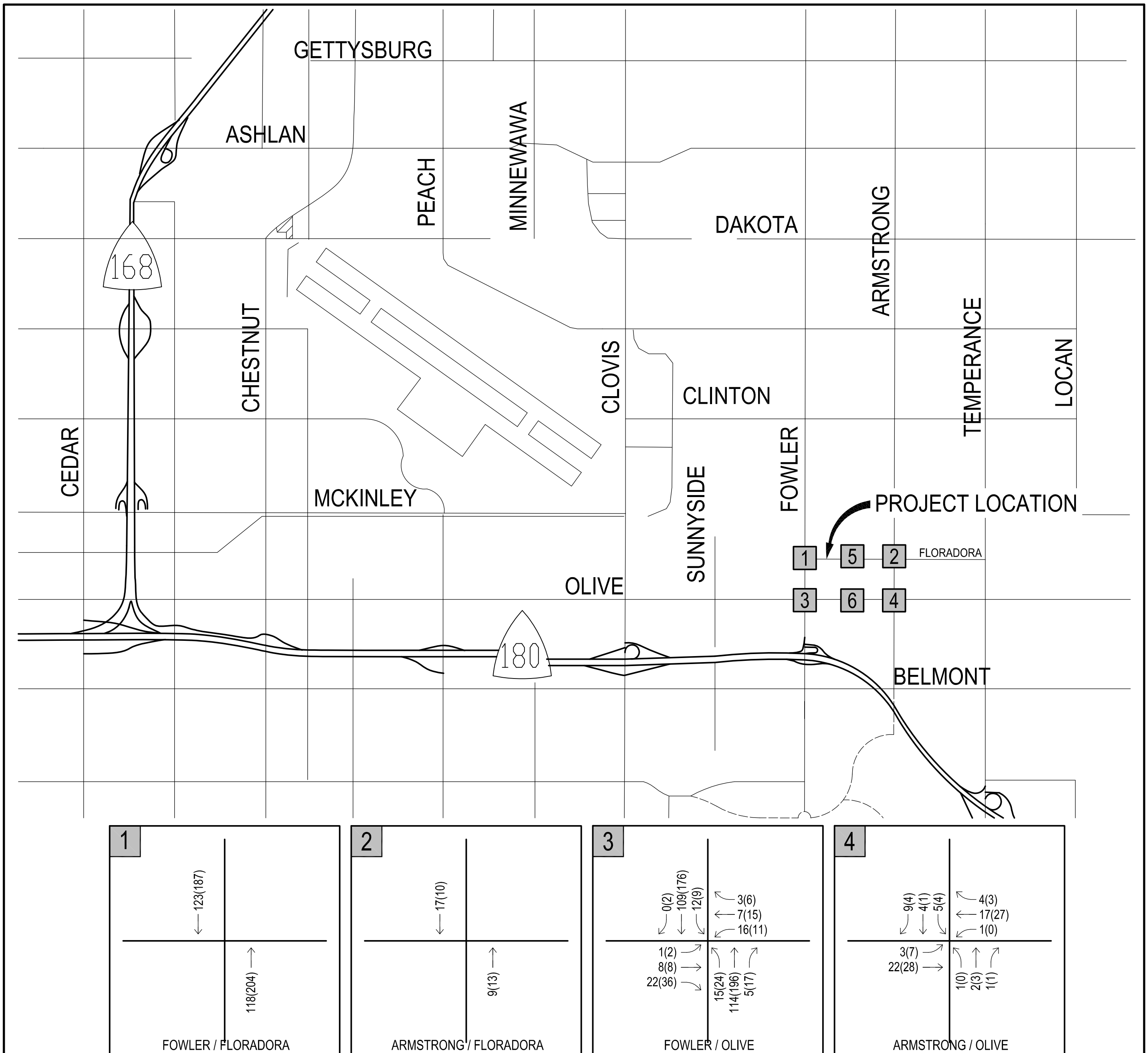
Proposed City of Fresno Southeast Surface Water Treatment Facility

Fresno, California

Not to Scale

PETERS ENGINEERING GROUP

Figure 4-2



LEGEND

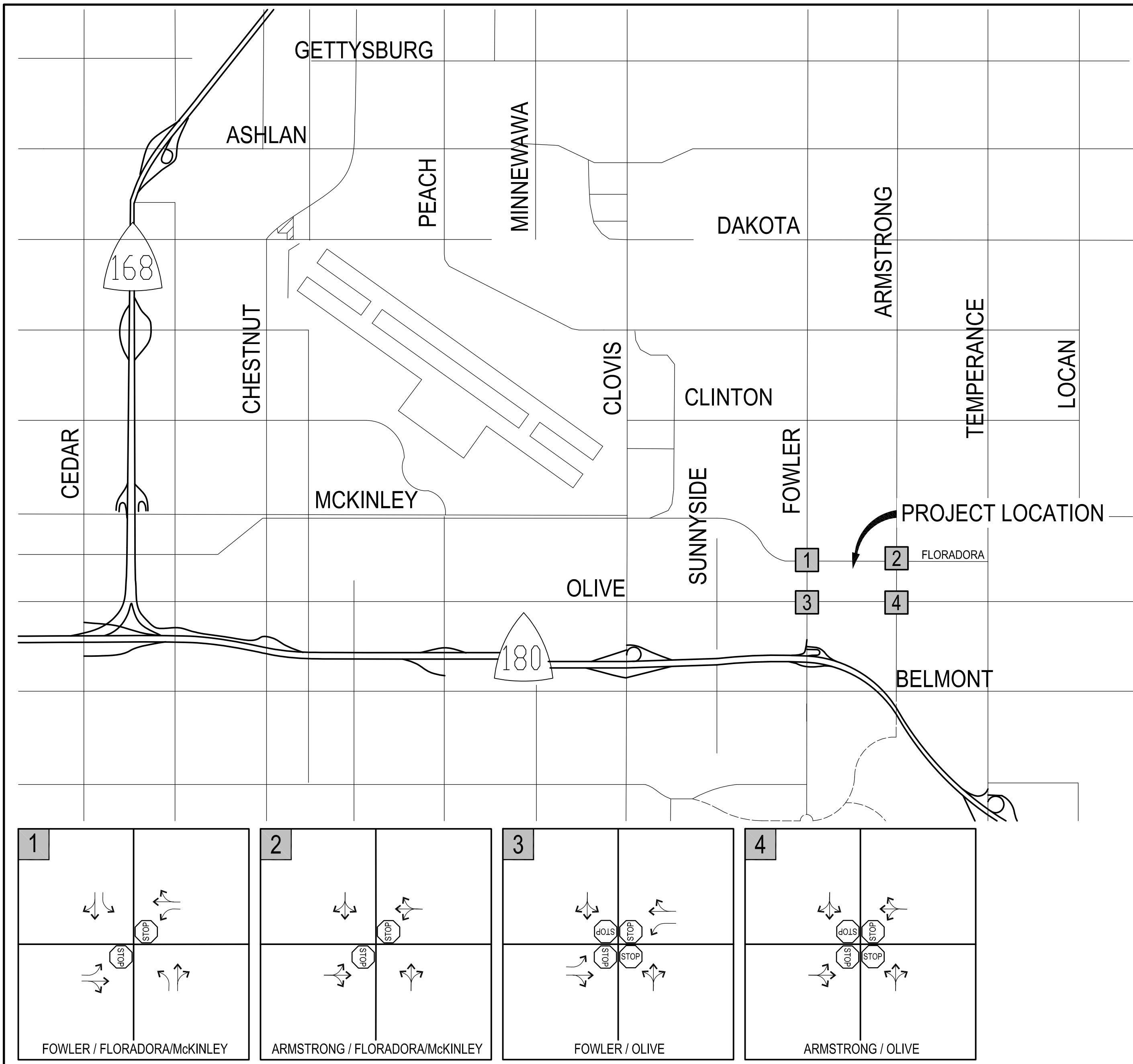
X	STUDY AREA INTERSECTIONS
XX (YY)	AM (PM) VOLUMES

PENDING PROJECT PEAK-HOUR TRAFFIC VOLUMES

Proposed City of Fresno Southeast Surface Water Treatment Facility

Fresno, California

Not to Scale



LEGEND

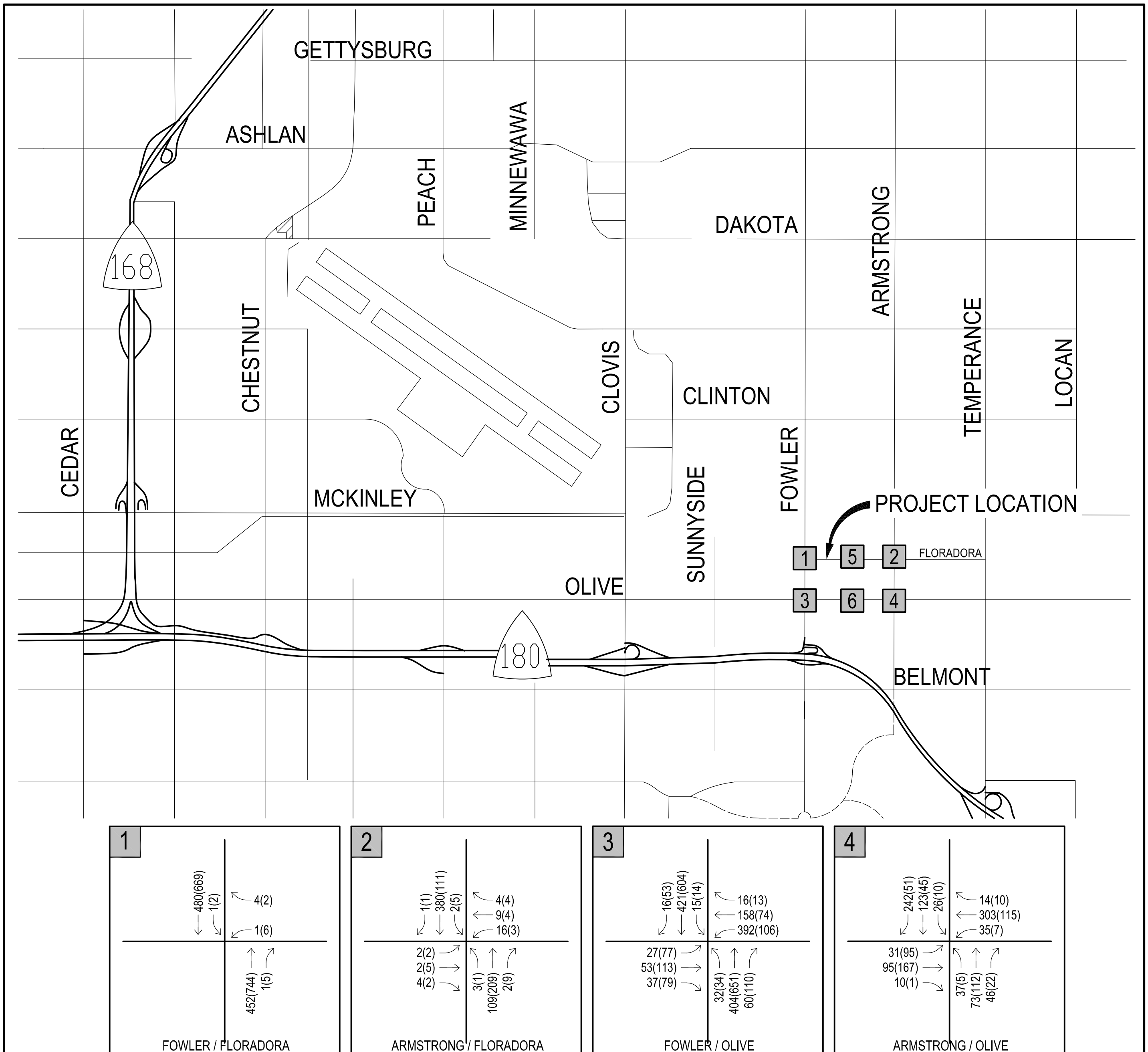
- SIGNALIZED INTERSECTION
- STOP SIGN
- DIRECTION OF TRAVEL
- X STUDY AREA INTERSECTIONS

YEAR 2035 BASELINE LANE CONFIGURATIONS AND INTERSECTION CONTROL
McKINLEY AVENUE REALIGNMENT

Proposed City of Fresno Southeast Surface Water Treatment Facility

Fresno, California

Not to Scale



LEGEND

X STUDY AREA INTERSECTIONS

XX (YY) AM (PM) VOLUMES

NEAR-TERM NO PROJECT PEAK-HOUR TRAFFIC VOLUMES

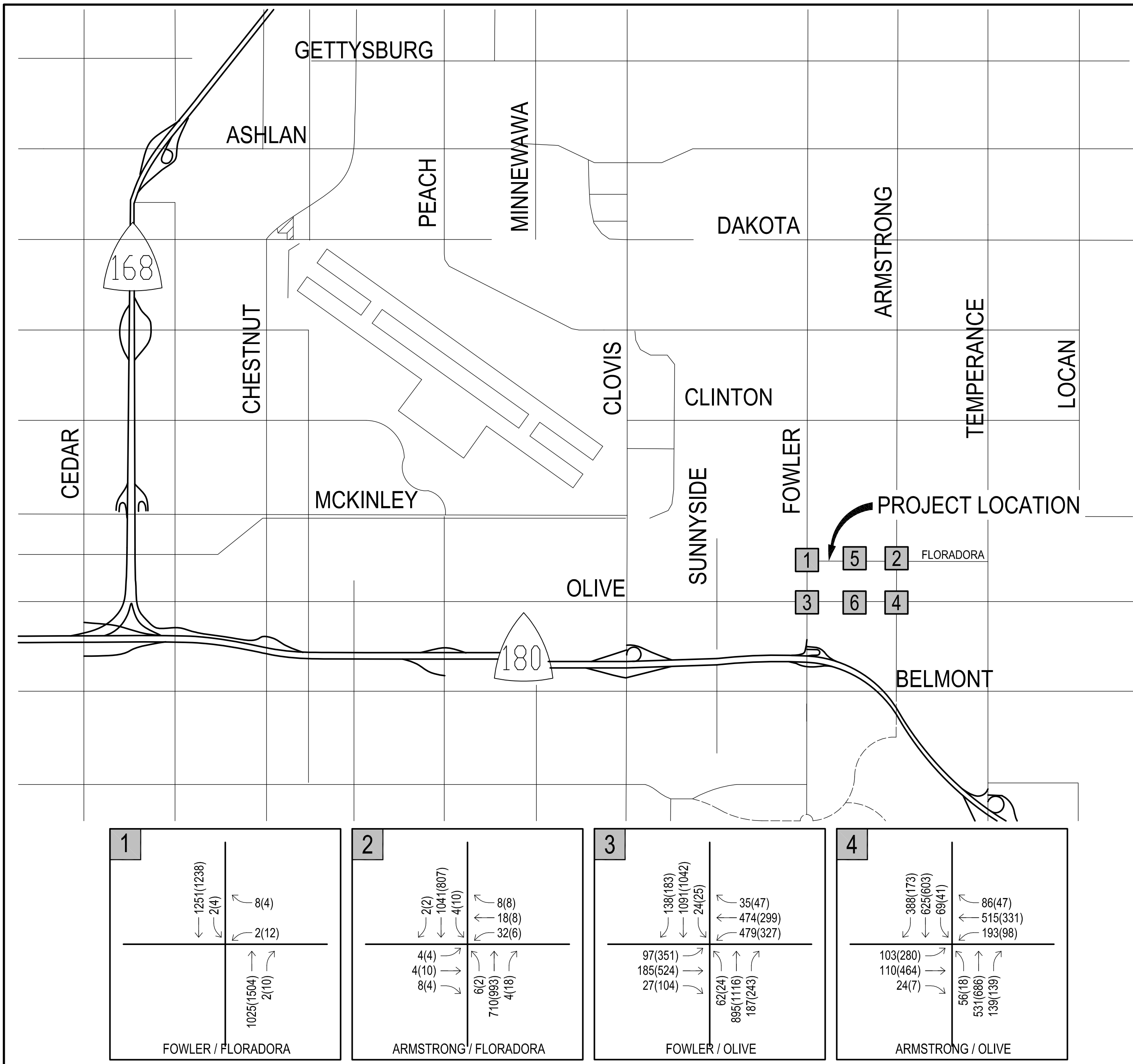
Proposed City of Fresno Southeast Surface Water Treatment Facility

Fresno, California

Not to Scale

PETERS ENGINEERING GROUP

Figure 5-3



LEGEND

X	STUDY AREA INTERSECTIONS
XX (YY)	AM (PM) VOLUMES

CUMULATIVE 2035 NO PROJECT PEAK-HOUR TRAFFIC VOLUMES

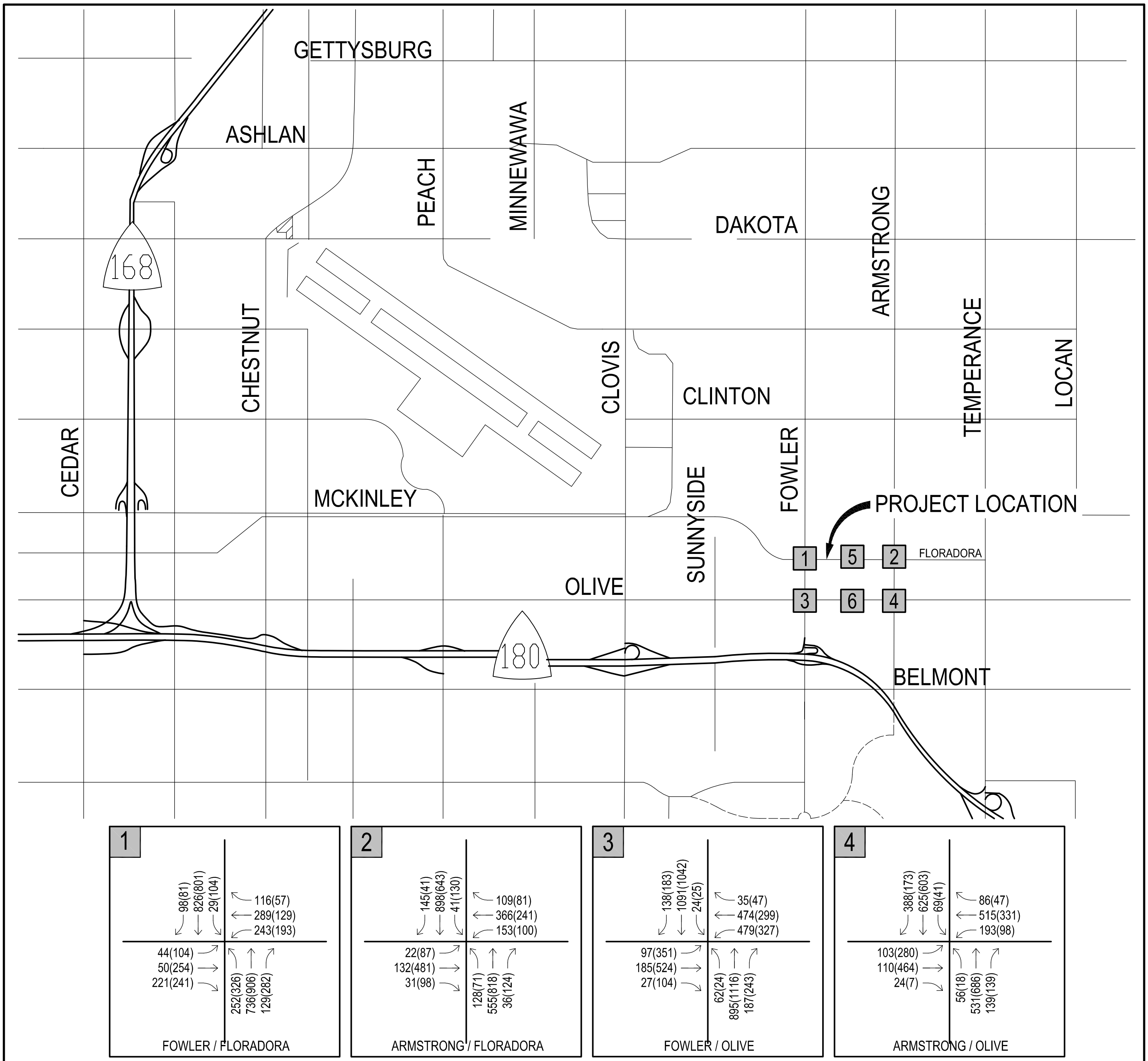
Proposed City of Fresno Southeast Surface Water Treatment Facility

Fresno, California

Not to Scale

PETERS ENGINEERING GROUP

Figure 5-4



LEGEND

X STUDY AREA INTERSECTIONS

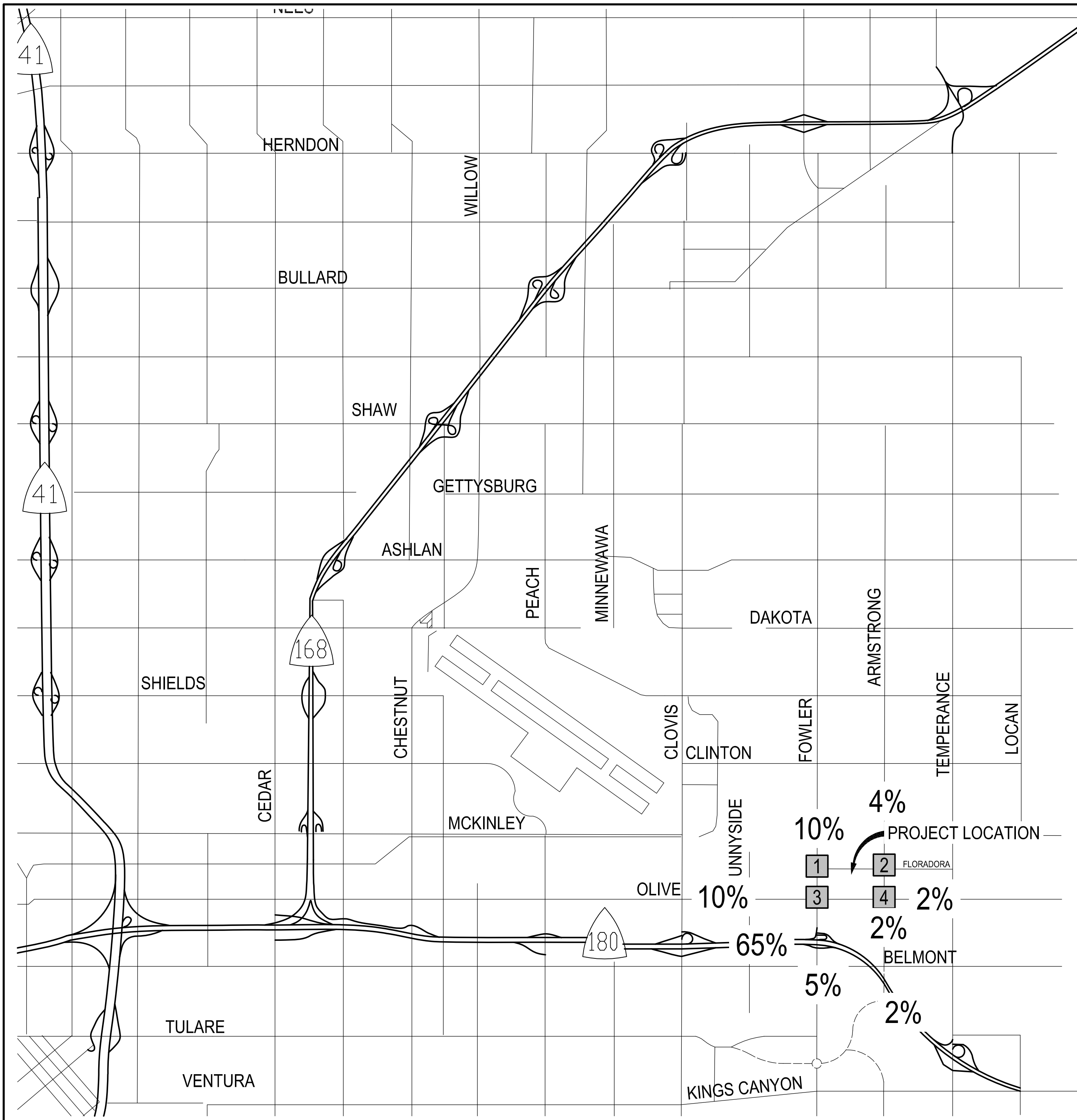
XX (YY) AM (PM) VOLUMES

CUMULATIVE 2035 NO PROJECT
PEAK-HOUR TRAFFIC VOLUMES WITH McKINLEY ALIGNMENT

Proposed City of Fresno Southeast Surface Water Treatment Facility

Fresno, California

Not to Scale



LEGEND

X STUDY AREA INTERSECTIONS

PROJECT TRAFFIC DISTRIBUTION PERCENTAGE

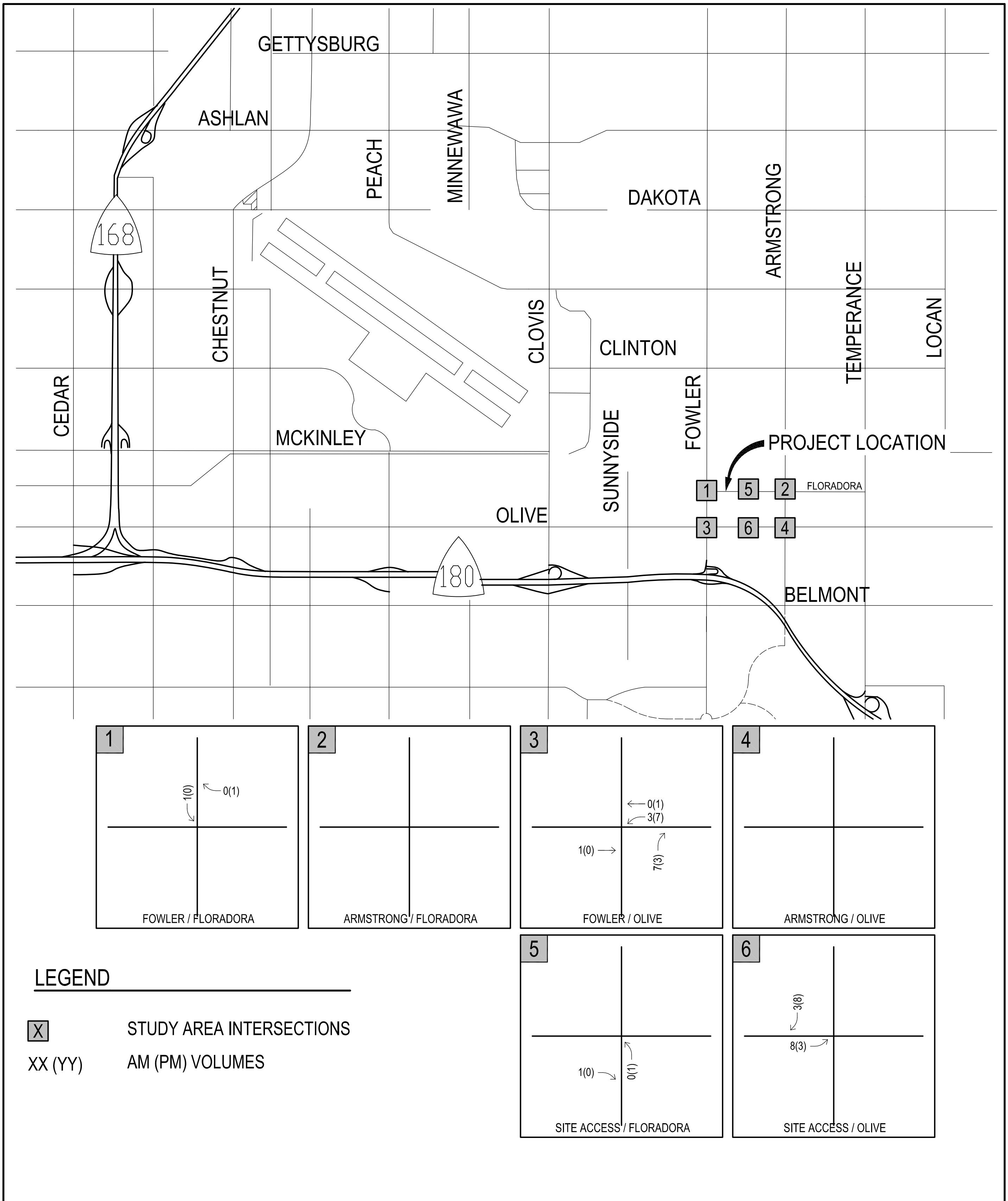
Proposed City of Fresno Southeast Surface Water Treatment Facility

Fresno, California

Not to Scale

PETERS ENGINEERING GROUP

Figure 8-1

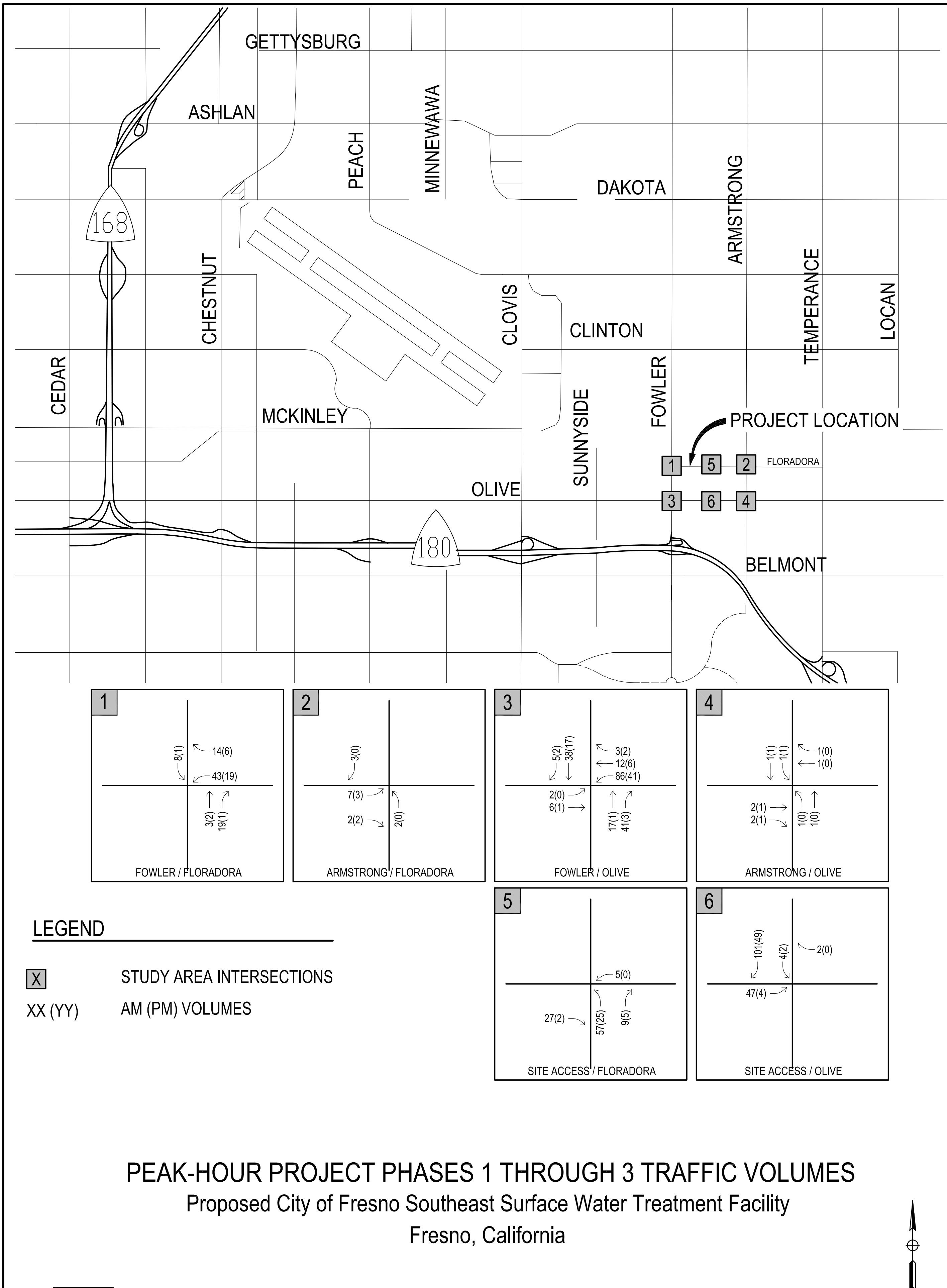


PEAK-HOUR PROJECT PHASES 1 AND 2 TRAFFIC VOLUMES

Proposed City of Fresno Southeast Surface Water Treatment Facility

Fresno, California

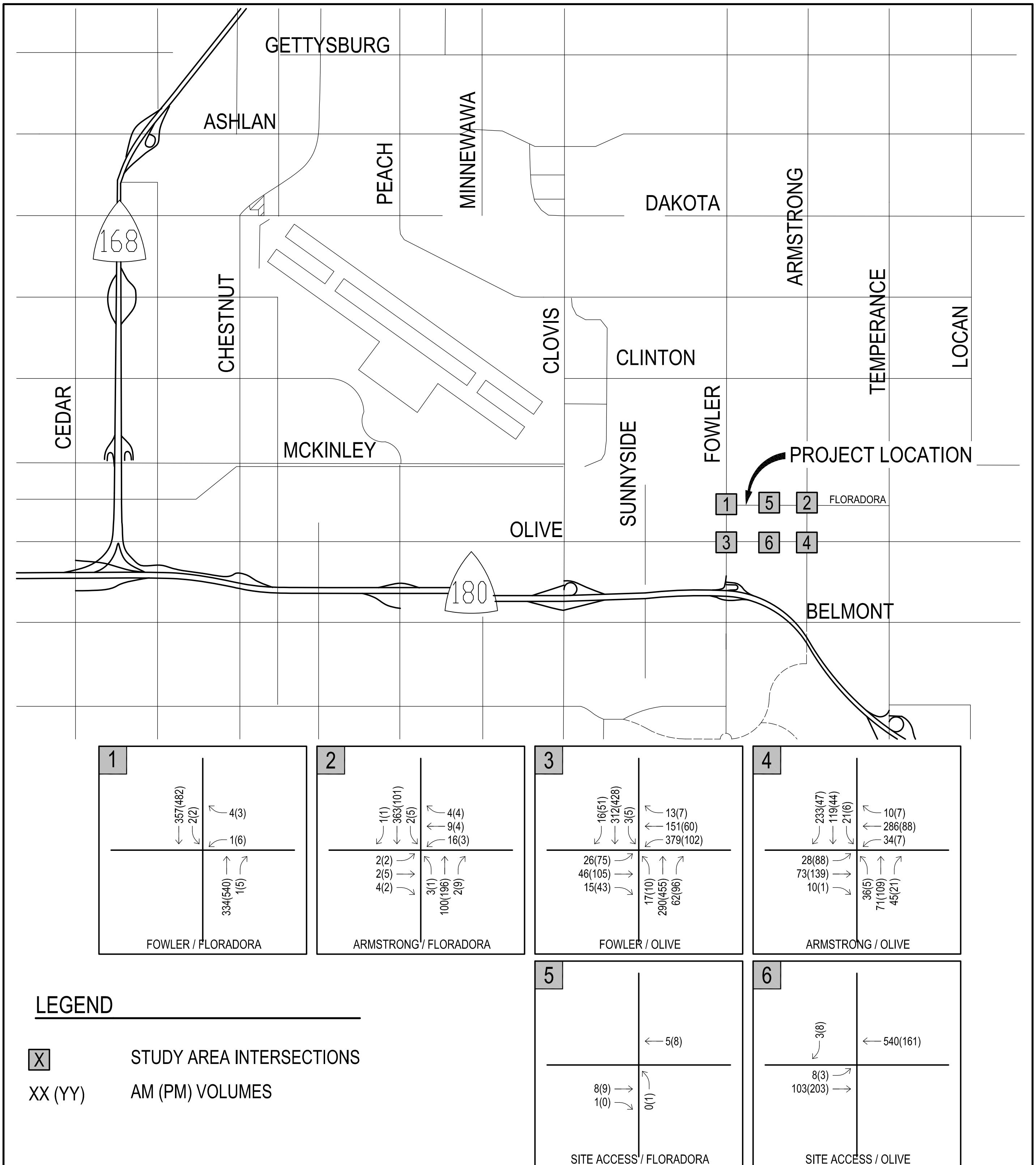
Not to Scale



PEAK-HOUR PROJECT PHASES 1 THROUGH 3 TRAFFIC VOLUMES

Proposed City of Fresno Southeast Surface Water Treatment Facility

Fresno, California

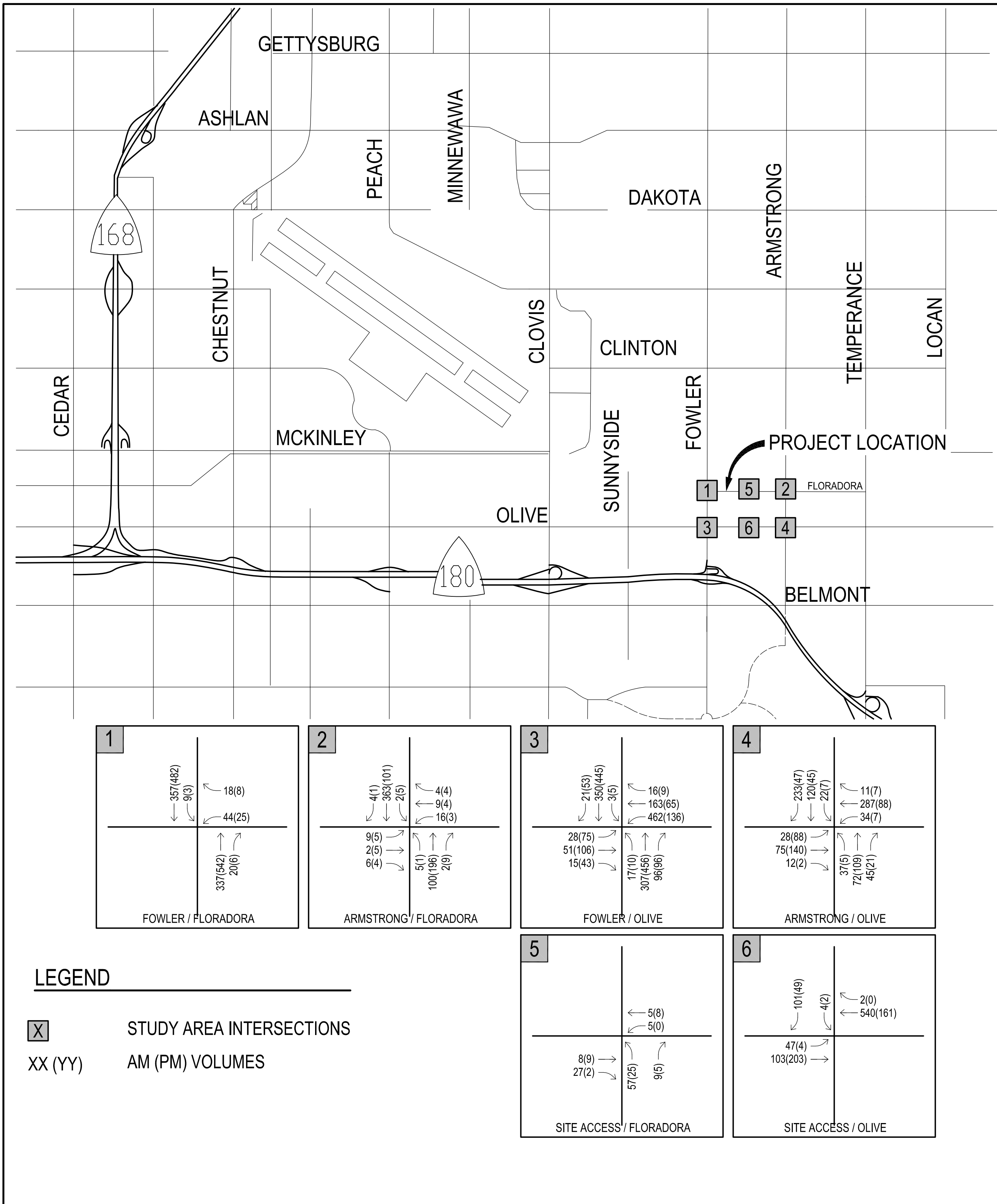


EXISTING PLUS PROJECT PHASES 1 AND 2 PEAK-HOUR TRAFFIC VOLUMES

Proposed City of Fresno Southeast Surface Water Treatment Facility

Fresno, California

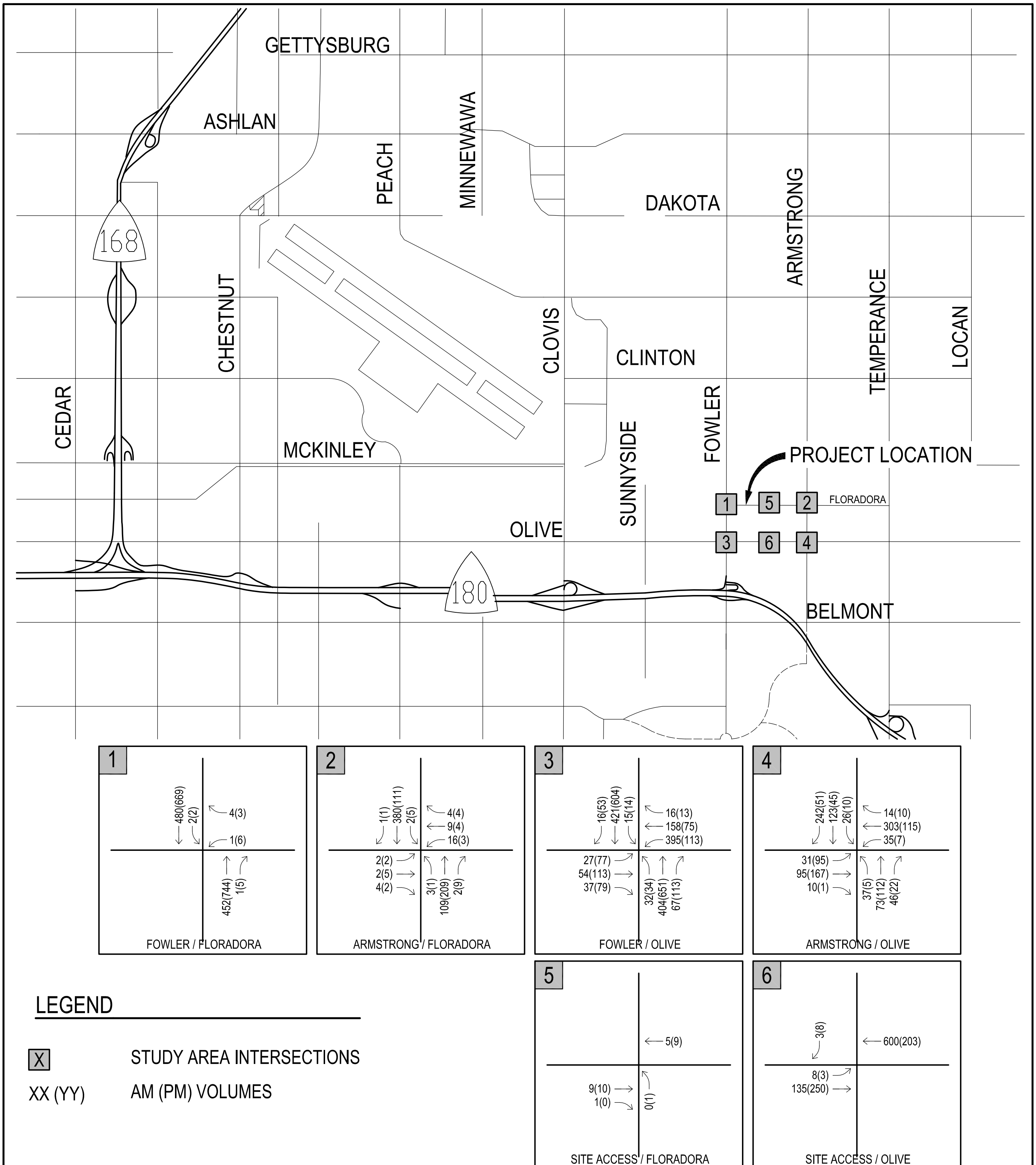
Not to Scale



EXISTING PLUS PROJECT PHASES 1 THROUGH 3 PEAK-HOUR TRAFFIC VOLUMES

Proposed City of Fresno Southeast Surface Water Treatment Facility

Fresno, California



NEAR-TERM PLUS PROJECT PHASES 1 AND 2 PEAK-HOUR TRAFFIC VOLUMES

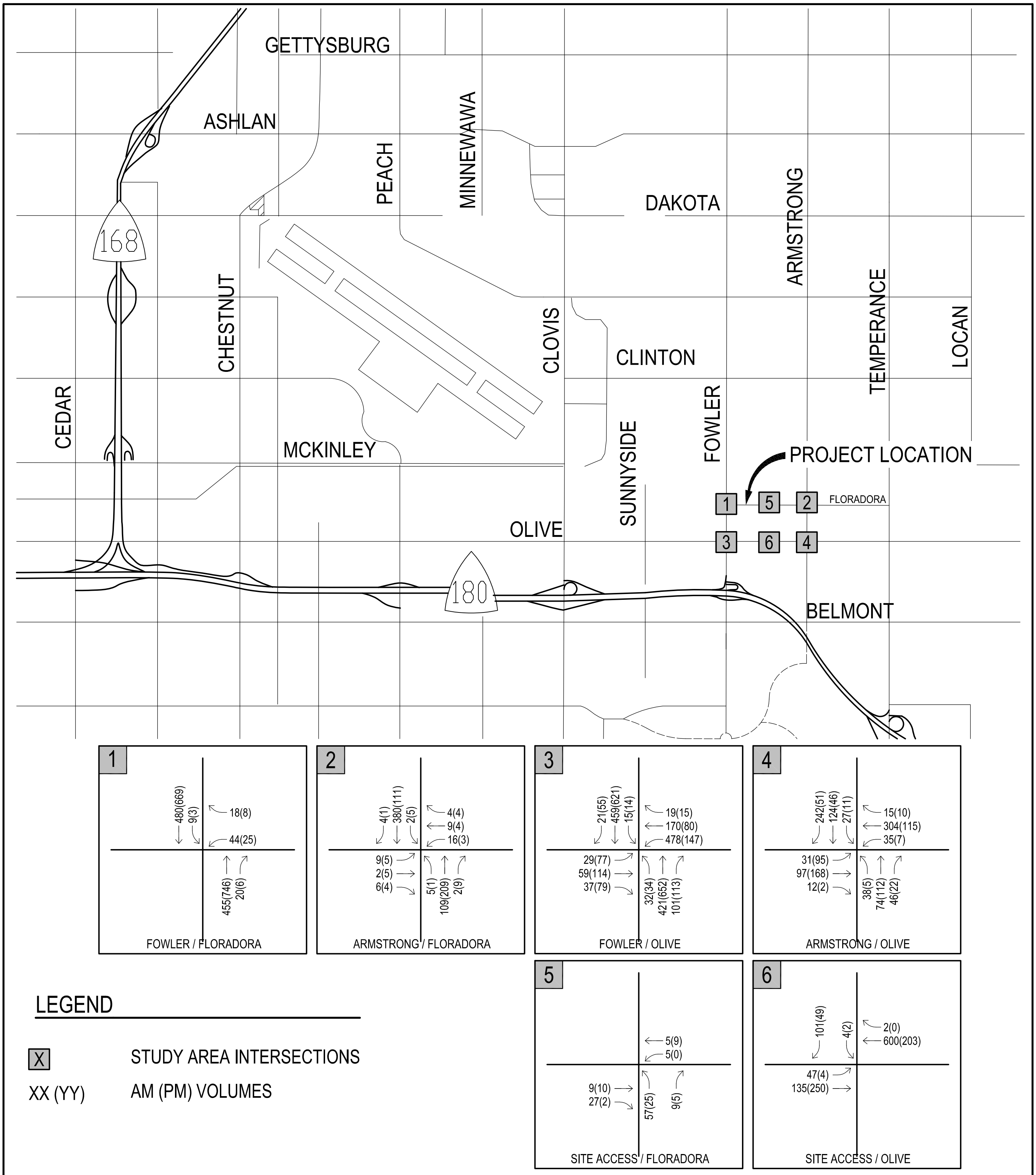
Proposed City of Fresno Southeast Surface Water Treatment Facility

Fresno, California

Not to Scale

PETERS ENGINEERING GROUP

Figure 11-1

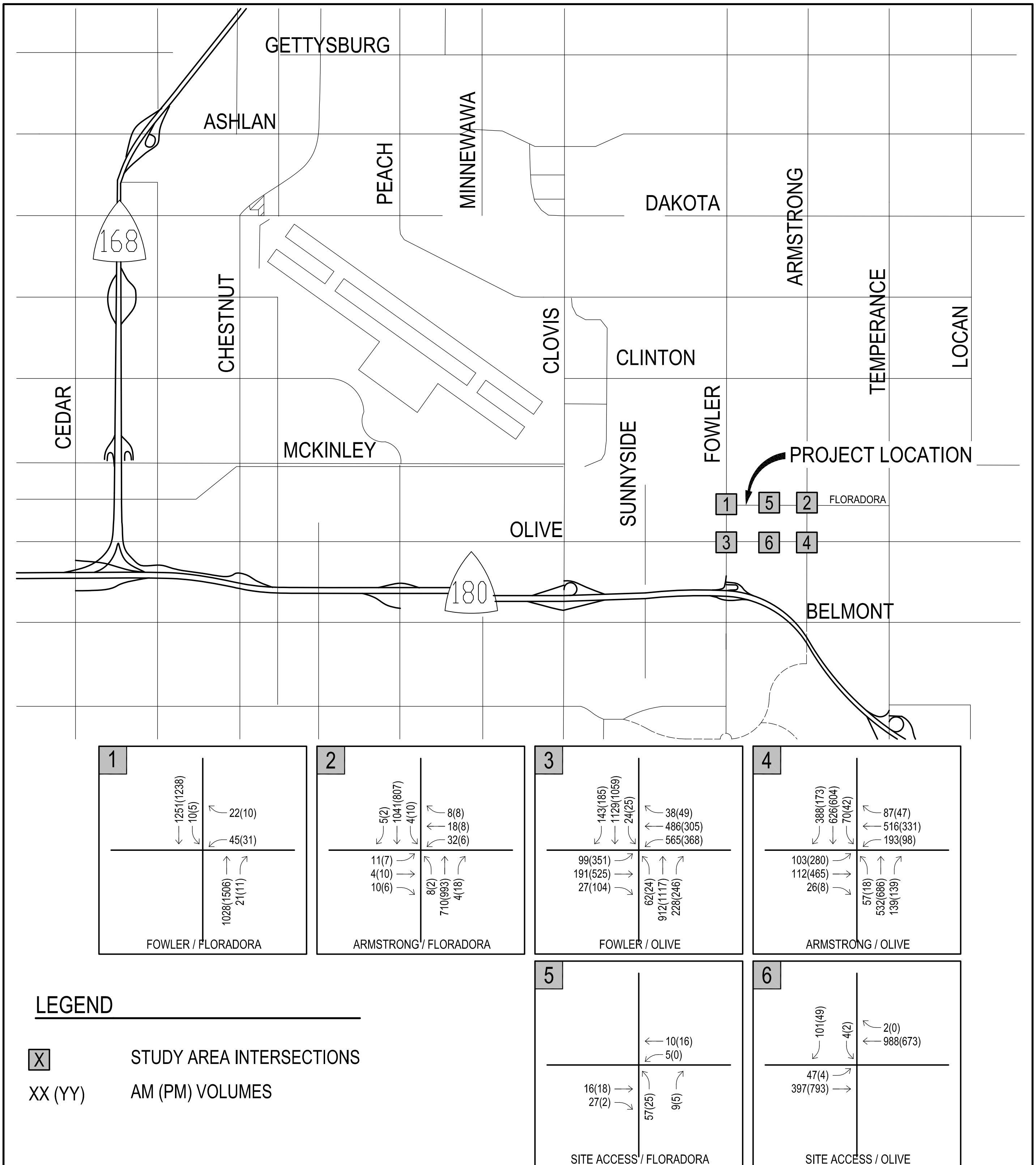


NEAR-TERM PLUS PROJECT PHASES 1 THROUGH 3 PEAK-HOUR TRAFFIC VOLUMES

Proposed City of Fresno Southeast Surface Water Treatment Facility

Fresno, California

Not to Scale

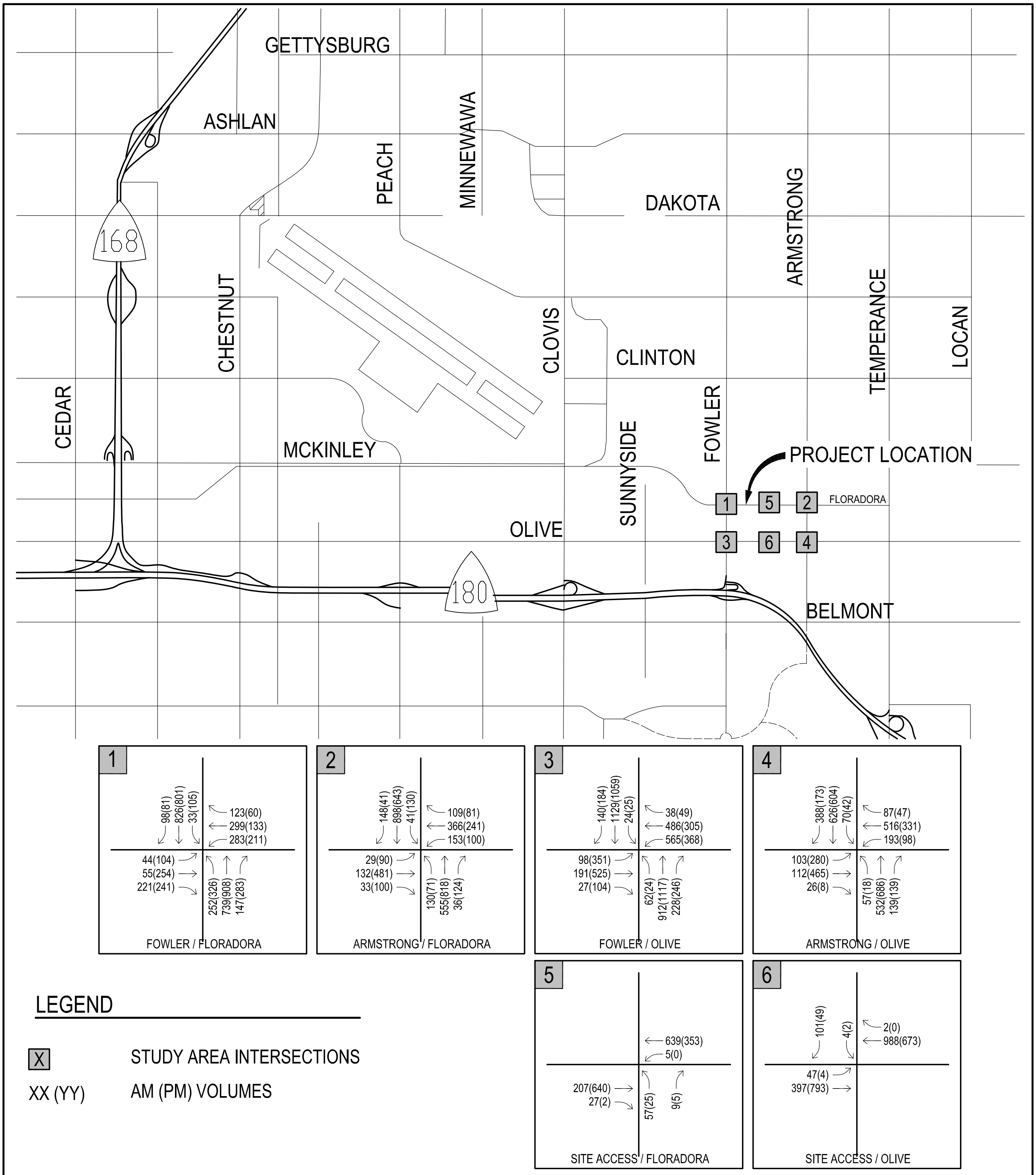


CUMULATIVE 2035 PLUS PROJECT PEAK-HOUR TRAFFIC VOLUMES

Proposed City of Fresno Southeast Surface Water Treatment Facility

Fresno, California

Not to Scale



CUMULATIVE 2035 PLUS PROJECT
PEAK-HOUR TRAFFIC VOLUMES WITH McKINLEY ALIGNMENT
Proposed City of Fresno Southeast Surface Water Treatment Facility
Fresno, California

APPENDIX A

SCOPING LETTER AND RESPONSES

Scoping Letter

PETERS ENGINEERING GROUP
A California Corporation

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West Yost Associates
7041 Koll Center Parkway, Suite 110
Pleasanton, California 94566

March 29, 2012

Subject: Scope of Traffic Impact Study
Proposed City of Fresno Southeast Surface Water Treatment Facility
Northwest of the Intersection of Armstrong and Olive Avenues
Fresno, California

Peters Engineering Group has been retained to perform a traffic impact study to be utilized in the Environmental Impact Report being prepared for the subject project. The purpose of this letter is to present the scope of the study after our initial consultations with the applicant. This letter may be presented to the City of Fresno (lead agency) and other affected agencies for review and comment.

Project Description

The proposed City of Fresno Southeast Surface Water Treatment Facility (SWTF) will be located on approximately 58 acres bounded by Olive Avenue on the south, Armstrong Avenue on the east, Floradora Avenue on the north, and existing parcels to the west. The City of Fresno Water Division is proposing the project, which will be subject to the requirements of the City of Fresno Traffic Engineering Division. The facility is proposed to ultimately include a new water treatment plant and operations center capable of treating 80 million gallons per day (mgd), new Water Division corporation yard, and Water Division administrative offices at the site. The project may also include an education center and demonstration garden. Site access will be provided via driveways connecting to Floradora and Olive Avenues.

The project is envisioned to be developed in three phases as follows:

- Phase 1: 40 mgd SWTF and operations building
- Phase 2: 40 mgd expansion of existing SWTF (resulting total of 80 mgd)
- Phase 3: Water Division corporation yard and administrative offices

The Project site location is presented in the attached Figure 1, Site Vicinity Map, and a preliminary Project site plan is presented in the attached Figure 2, Site Plan.

Trip Generation

Data provided in the Institute of Transportation Engineers (ITE) *Trip Generation, 8th Edition*, is typically used to estimate the number of trips anticipated to be generated by proposed projects. However, there is no data provided for water treatment plants or City corporation yards. West Yost Associates provided Peters Engineering Group with trip generation estimates for the project based on anticipated numbers of employees and shift schedules which appear to be reasonable. Information provided by West Yost Associates is presented in Table 7 following the figures attached to this report.

In general, Phases 1 and 2 will generate few trips because a surface water treatment facility requires few employees. With the addition of the Water Division corporation yard and administrative offices in Phase 3 the number of employees at the site will increase substantially. Many of those employees will arrive before 7:00 a.m. and will leave the site after 7:00 a.m. in City vehicles. Those same City vehicles will typically return and the employees will leave the site in their personal vehicles before 4:00 p.m. Table 1 presents a summary of the daily and peak-hour trip generation estimates for the Project (peak hours occur between 7:00 and 9:00 a.m. and between 4:00 and 6:00 p.m.).

Table 1
Project Trip Generation

Project Scenario	Daily	A.M. Peak Hour			P.M. Peak Hour		
		In	Out	Total	In	Out	Total
Phase 1	28	5	2	7	2	5	7
Phases 1 and 2	40	8	2	10	2	8	10
Phases 1 through 3	872	78	168	246	2	78	80

Reference: West Yost Associates

The education center and demonstration garden will potentially generate a minimal volume of off-peak trips. Internal trip reductions and pass-by trip reductions are not applicable to the proposed project and will not be considered in the analyses.

The number of Project trips (Phases 1 through 3) expected on State facilities, specifically at the State Route (SR) 180 interchange at Fowler Avenue, is presented in Table 2.

Table 2
Project Trips at SR 180 / Fowler Avenue Interchange

Location	Peak Hour Project Trips					
	Phase 1		Phase 1 & 2		Phases 1 - 3	
	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
SR 180 EB on ramp	0	0	0	0	3	0
SR 180 EB off ramp	4	2	6	2	59	2
SR 180 WB on ramp from NB Fowler Avenue	0	0	0	0	0	0
SR 180 WB on ramp from SB Fowler Avenue	2	4	2	4	126	59
SR 180 WB off ramp	0	0	0	0	2	0
Fowler Avenue SB past SR 180	0	0	0	0	5	2
Fowler Avenue NB past SR 180	0	0	0	0	2	0

WB – Westbound EB – Eastbound NB – Northbound SB - Southbound

Traffic Modeling and Project Trip Distribution

The regional distribution of Project traffic can be estimated by performing a select zone analysis using available traffic models. A select zone analyses was performed by Council of Fresno County Governments (COG). Peters Engineering Group requested that COG perform a select zone analysis of the traffic analysis zone (TAZ) that includes the project site based on the land uses assumed in the 2035 Fresno County travel model. The results of the select zone analysis performed by COG are presented in Figures 6 and 7. The select zone analysis can be utilized to estimate the regional distribution of employee trips entering and exiting the site. The trips generated by the corporation yard (i.e., City work trucks leaving the site in the morning and returning to the site in the afternoon) are distributed manually assuming a relatively even distribution of traffic to the City of Fresno.

The percentage distribution of Project traffic is presented in the attached Figure 3, Project Trip Distribution Percentages.

The peak-hour Project traffic volumes presented in Table 2 were assigned to the study intersections and road segments in accordance with the trip distribution percentages described above. The peak-hour Project traffic volumes are presented in Figure 4, Weekday A.M. and P.M. Peak Hour Project Traffic Volumes.

Study Area

The following intersections have been counted and will be included in the study:

1. Fowler and Floradora Avenues
2. Fowler and Olive Avenues
3. Armstrong and Floradora Avenues
4. Armstrong and Olive Avenues

The following road segments have been counted and will be analyzed utilizing peak hour directional traffic volumes and the Florida Q/LOS tables:

1. Fowler Avenue road segment between Floradora and Olive Avenues
2. Armstrong Avenue road segment between Floradora and Olive Avenues
3. Floradora Avenue road segment between Fowler and Armstrong Avenues
4. Olive Avenue road segment between Fowler and Armstrong Avenues

Traffic counts at the intersections and road segments listed above were performed on Wednesday, December 14, 2011. The existing peak-hour traffic volumes are presented in Figure 5, Weekday A.M. and P.M. Peak Hour Project Traffic Volumes. The intersection traffic count data sheets are attached at Tables 8 through 11. The intersection and road segment level of service (LOS) will be analyzed based on peak-hour traffic volumes.

Pending and Future Projects

The near-term analyses consider the effects of traffic expected to be generated by pending projects in the vicinity of the Project site. Table 3 presents a summary of the pending projects included in the analysis.

Table 3
Pending Projects

Project	Location	A.M. Peak Hour Traffic Volumes		P.M. Peak Hour Traffic Volumes		Weekday Traffic Volumes
		Enter	Exit	Enter	Exit	
Tract 5499	Southeast of Fowler and Belmont	59	20	67	39	1,005
Tract 5552	East of Fowler Avenue between Church and Temperance	20	61	69	41	1,060
Tract 5531	California Avenue between Armstrong and Temperance	65	194	220	129	3,302
Tract 5290	SW of Armstrong and Hamilton	30	88	101	59	1,558
Fancher Creek*	NW of Clovis Avenue and Kings Canyon Road	2,780	1,864	3,879	4,610	89,423
Lonestar	Bounded by Church, Jensen, Fowler, and Sunnyside	Data obtained from project traffic sheets. Totals not included.				
Tract 5310	East of Armstrong Avenue between Butler Avenue and Kings Cyn Road	17	51	57	34	852
Tract 4598	SE of Armstrong and Butler	18	53	59	35	906
Retail	NW of Clovis and Jensen	Data obtained from project traffic sheets. Totals not included.				
Tract 5464	SW of Hamilton and Temperance	35	104	118	69	1,832
Tract 5638	Church and Armstrong	85	257	290	170	4,356

* Although Fancher Creek is an approved project, buildout will last several years and these traffic volumes will be considered in the long-term analyses based on the Fresno County travel model.

Study Scenarios

The study time periods will include the weekday a.m. and p.m. peak hours determined between 7:00 and 9:00 a.m. and between 4:00 and 6:00 p.m. on a typical weekday. The peak hours will be analyzed for the following conditions:

- Existing Conditions;
- Existing Plus Phases 1 and 2 Project Conditions;
- Existing Plus Phases 1 through 3 Project Conditions;
- Near-Term With Phases 1 and 2 Project Conditions (includes approved and pending projects);
- Near-Term With Phases 1 through 3 Project Conditions (includes approved and pending projects);
- Year 2035 No-Project Conditions;
- Year 2035 With Phases 1 through 3 Project Conditions.

Based on the trip generation volumes, it is anticipated that Phases 1 and 2 of the project will not cause significant impacts. However, if the analyses indicate that Phases 1 and 2 will cause near-term impacts, then additional scenarios will be analyzed to determine if Phase 1 alone causes significant impacts.

Significance Criteria

The Transportation Research Board *Highway Capacity Manual,* 2000, (HCM) defines level of service (LOS) as a qualitative measure describing operational characteristics within a traffic stream, based on service measures such as speed and travel time, freedom to maneuver, traffic interruptions, comfort, and convenience. LOS characteristics for both unsignalized and signalized intersections are presented in Tables 4 and 5. LOS characteristics for road segments are presented in Table 6.

Table 4
Level of Service Characteristics for Unsignalized Intersections

Level of Service	Description	Average Vehicle Delay (seconds)
A	Little or no delay.	0-10
B	Short delays.	>10-15
C	Average delays.	>15-25
D	Long delays.	>25-35
E	Very long delays.	>35-50
F	Extremely long delays.	>50

Reference: *Highway Capacity Manual,* Transportation Research Board

Table 5
Level of Service Characteristics for Signalized Intersections

Level of Service	Description	Average Vehicle Delay (seconds)
A	Extremely favorable progression. Most vehicles arrive during green phase. Many vehicles do not stop.	$\leq$10
B	Good progression.	>10-20
C	Fair progression. Significant number of vehicles stopped. Some queues do not clear.	>20-35
D	Noticeable congestion. Many vehicles stop. Individual cycle failures are noticeable. Queues often do not clear.	>35-55
E	Poor progression. Individual cycle failures are frequent. Queues frequently do not clear.	>55-80
F	Poor progression. Oversaturation. Many individual cycle failures and queues not cleared.	>80

Reference: *Highway Capacity Manual,* Transportation Research Board

Table 6
Level of Service Characteristics for Roadways

Level of Service	Description
A	Primarily free flow operations
B	Reasonably unimpeded operations, ability to maneuver only slightly restricted
C	Stable operations, ability to maneuver and select operating speed affected
D	Unstable flow, speeds and ability to maneuver restricted
E	Significant delays, flow quite unstable
F	Extremely slow speeds

Reference: 1998 *Highway Capacity Manual,* Transportation Research Board

The City of Fresno requires that LOS D or better be maintained to comply with the *2025 General Plan, Transportation/Streets and Highways, Policy E-1-f.* The City of Fresno recognizes a traffic impact if a proposed project will decrease the LOS below D at an intersection or road segment. The City of Fresno also recognizes a traffic impact if a project will exacerbate an intersection already operating at a substandard LOS by increasing the average delay at the intersection by 5.0 seconds or more, or by causing the LOS to drop from E to F. Finally, the City of Fresno recognizes a traffic impact if a project will exacerbate a road segment already operating at substandard LOS by increasing the volume-to-capacity ratio (v/c) of the road segment by 0.15 or more, or by causing the LOS to drop from E to F.

The City of Fresno *Traffic Impact Study Report Guidelines* dated January 20, 2009 require a queuing analysis of the study intersections and recommendations for queues that are projected to exceed the available storage capacity. However, it should be noted that queuing is not included in the significance criteria recognized by the City and is reviewed to confirm the LOS results.

Closing

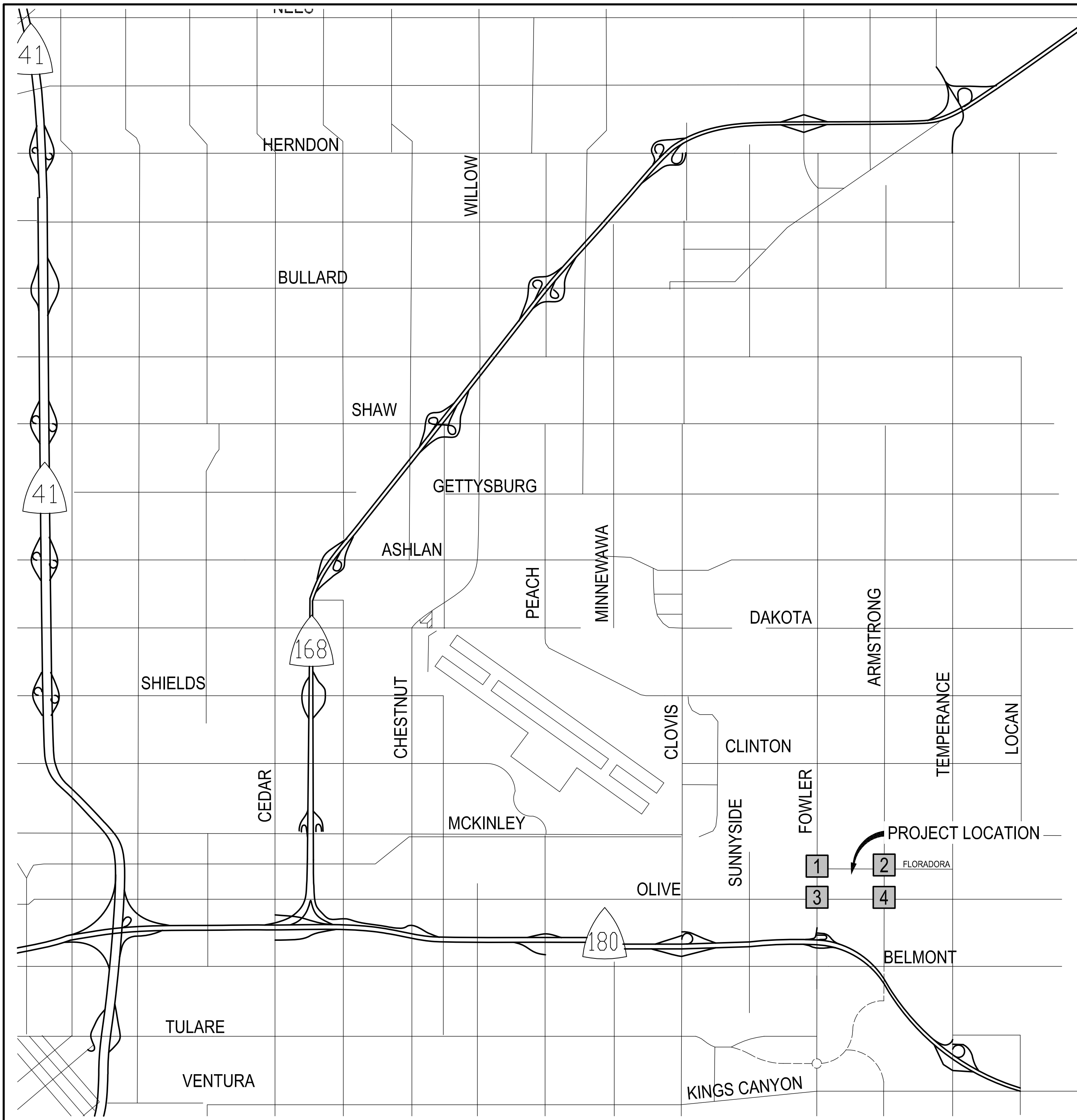
Peters Engineering Group is requesting any comments on the content of this letter as soon as possible, including requests to analyze additional intersections or road segments. We are currently proceeding with the study based on the information contained herein.

Thank you for the opportunity to work with you on this project. Please feel free to call our office if you have any questions.

PETERS ENGINEERING GROUP

John Rowland, PE, TE

Attachments: Tables 7 through 11
Figures 1 through 7



LEGEND

X STUDY AREA INTERSECTIONS

SITE VICINITY MAP

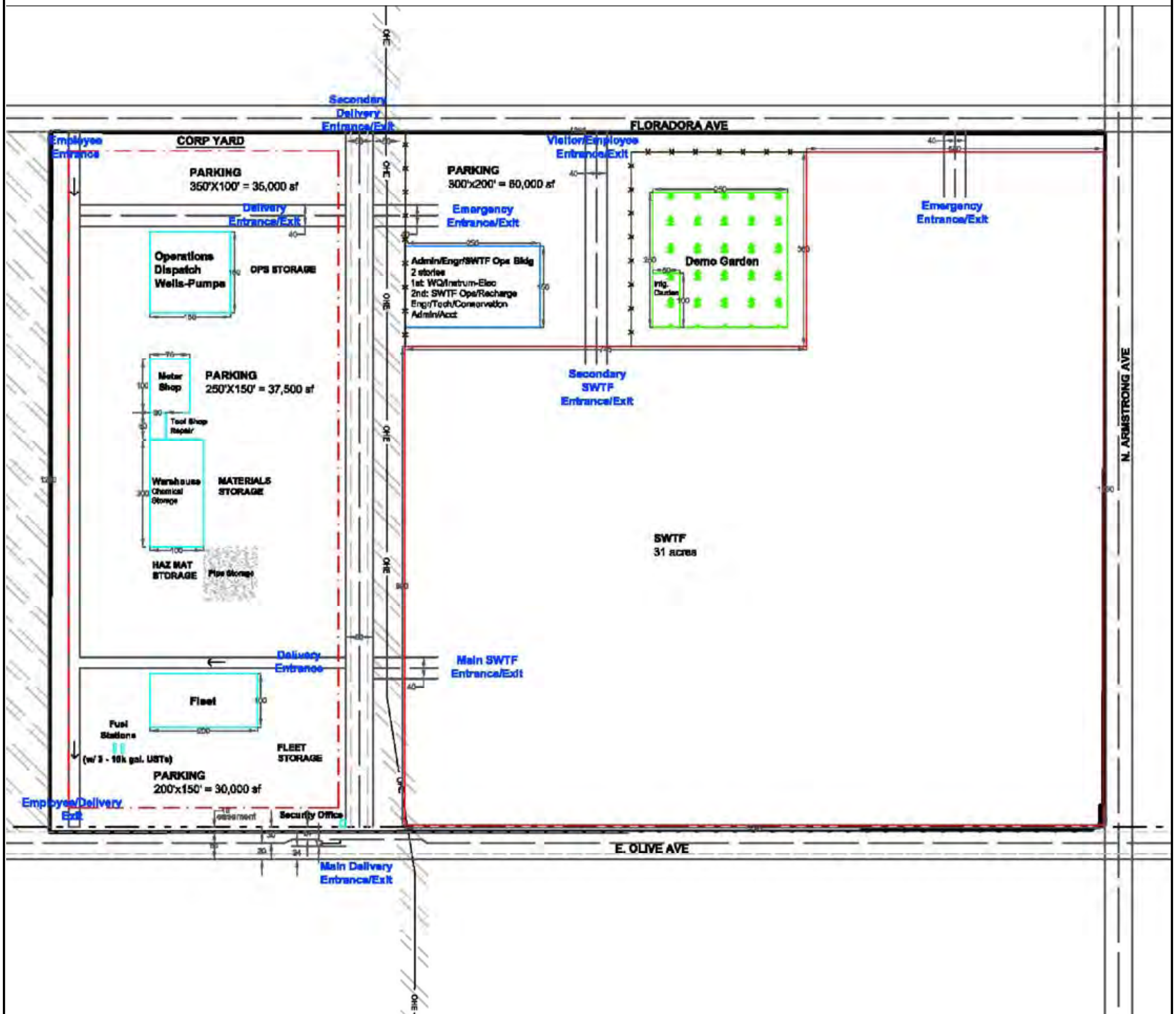
Proposed City of Fresno Southeast Surface Water Treatment Facility

Fresno, California

Not to Scale

PETERS ENGINEERING GROUP

Figure 1

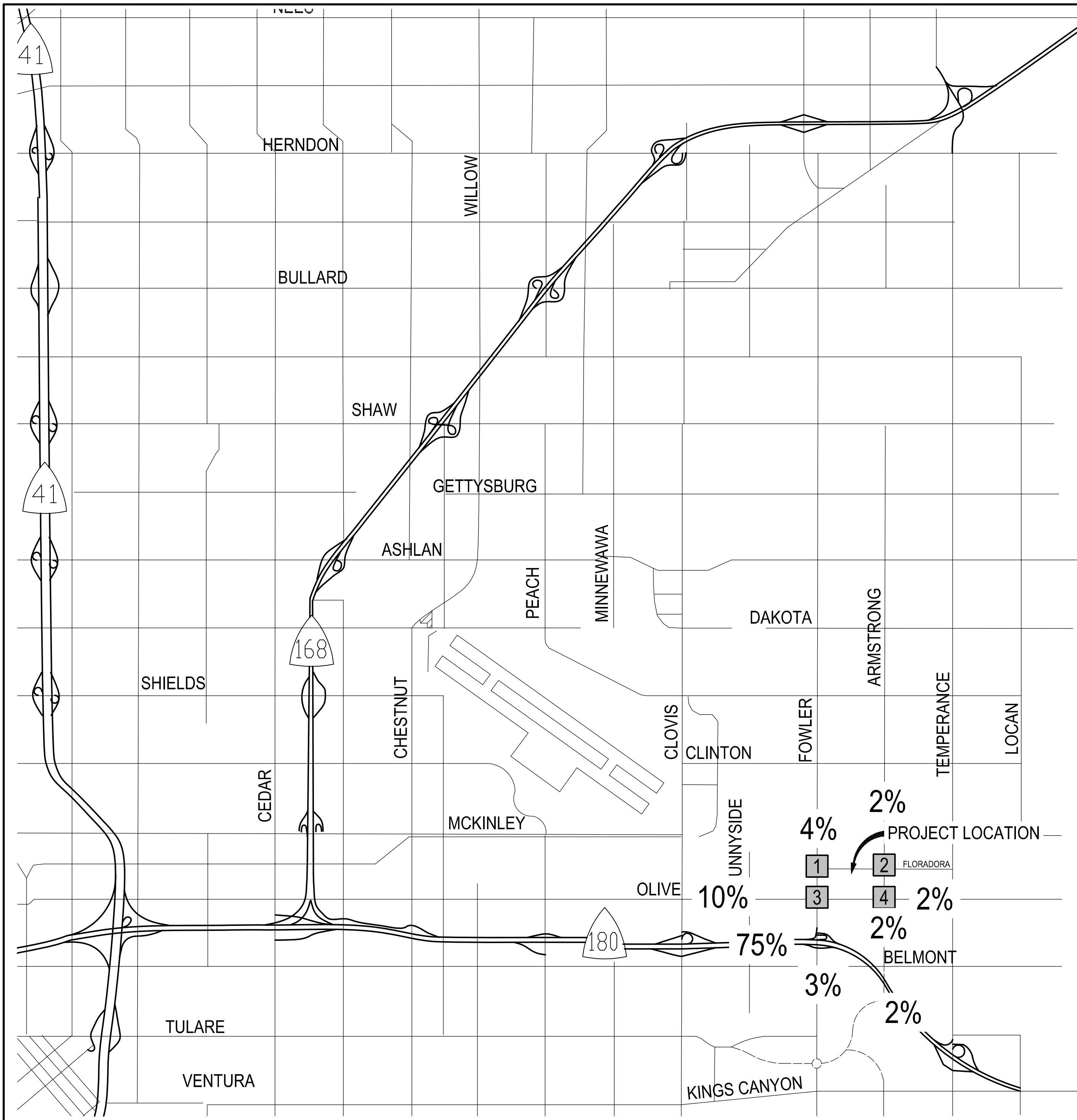


CONCEPTUAL SITE PLAN

Proposed City of Fresno Southeast Surface Water Treatment Facility

Fresno, California

Not to Scale



LEGEND

X	STUDY AREA INTERSECTIONS

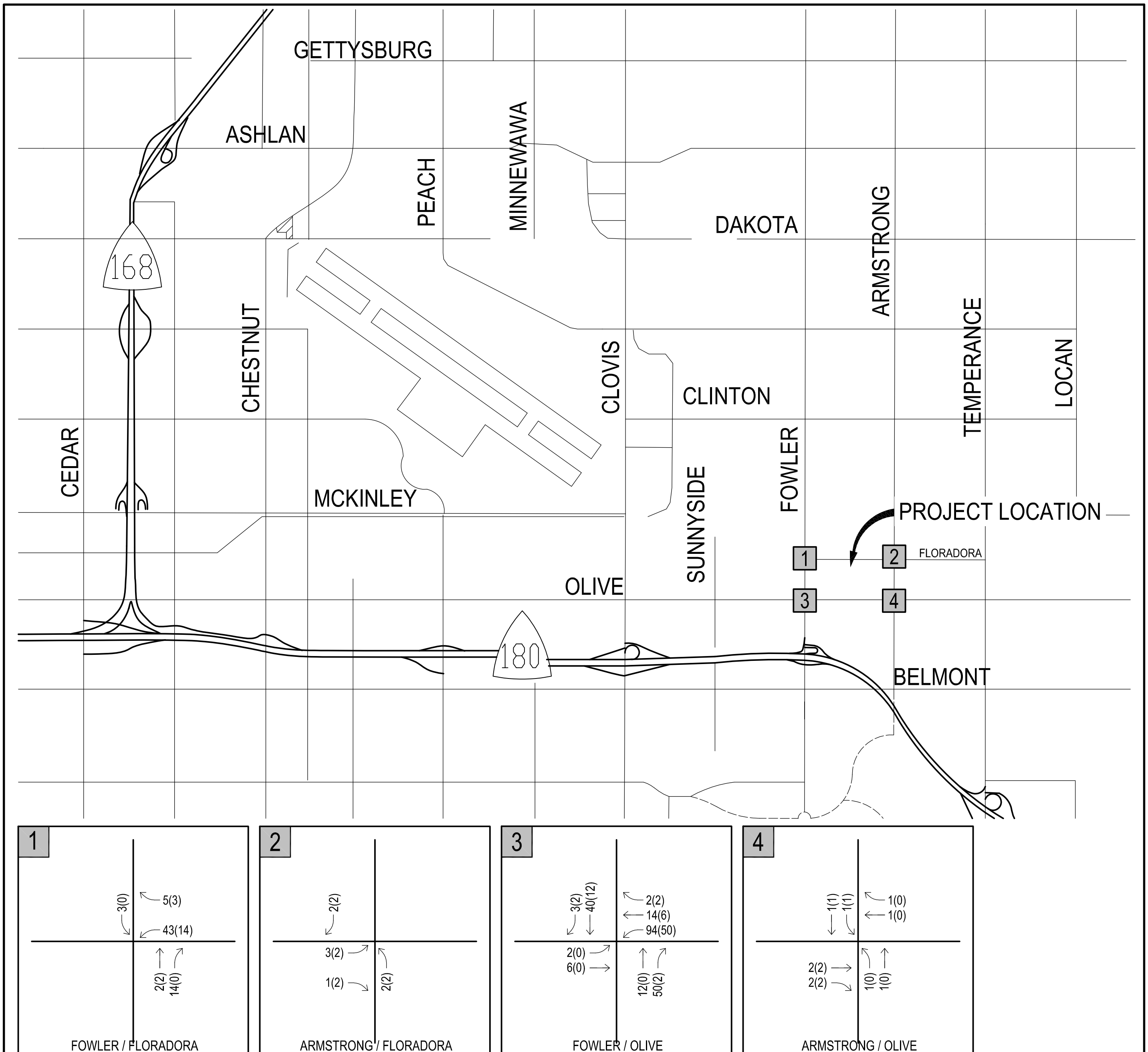
PROJECT TRAFFIC DISTRIBUTION PERCENTAGE

Proposed City of Fresno Southeast Surface Water Treatment Facility

Fresno, California

Not to Scale

PETERS ENGINEERING GROUP



LEGEND

X	STUDY AREA INTERSECTIONS
XX (YY)	AM (PM) VOLUMES

PEAK-HOUR PROJECT TRAFFIC VOLUMES

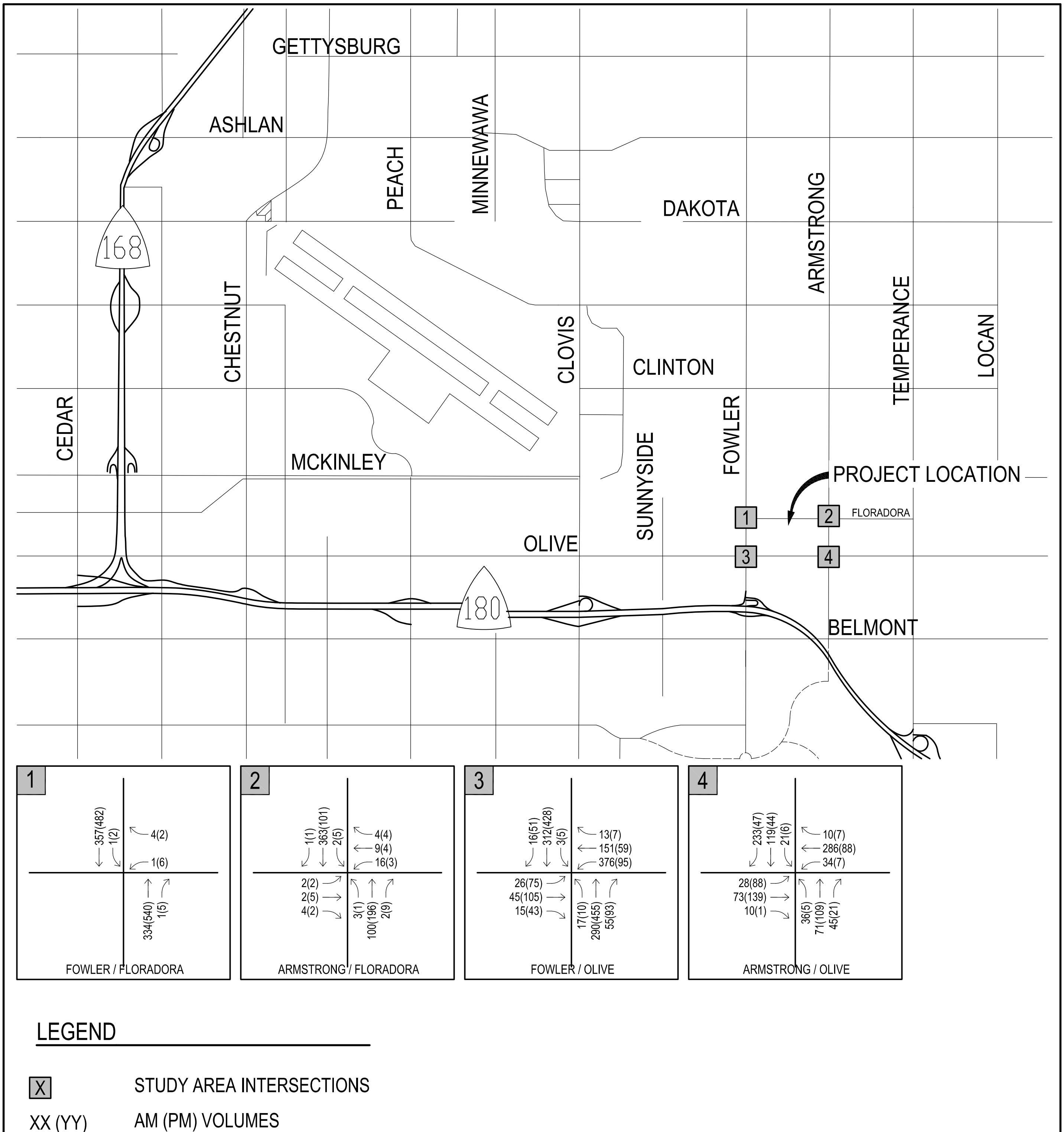
Proposed City of Fresno Southeast Surface Water Treatment Facility

Fresno, California

Not to Scale

PETERS ENGINEERING GROUP

Figure 4



EXISTING PEAK-HOUR TRAFFIC VOLUMES

Proposed City of Fresno Southeast Surface Water Treatment Facility

Fresno, California

Not to Scale

PETERS ENGINEERING GROUP

Table 7

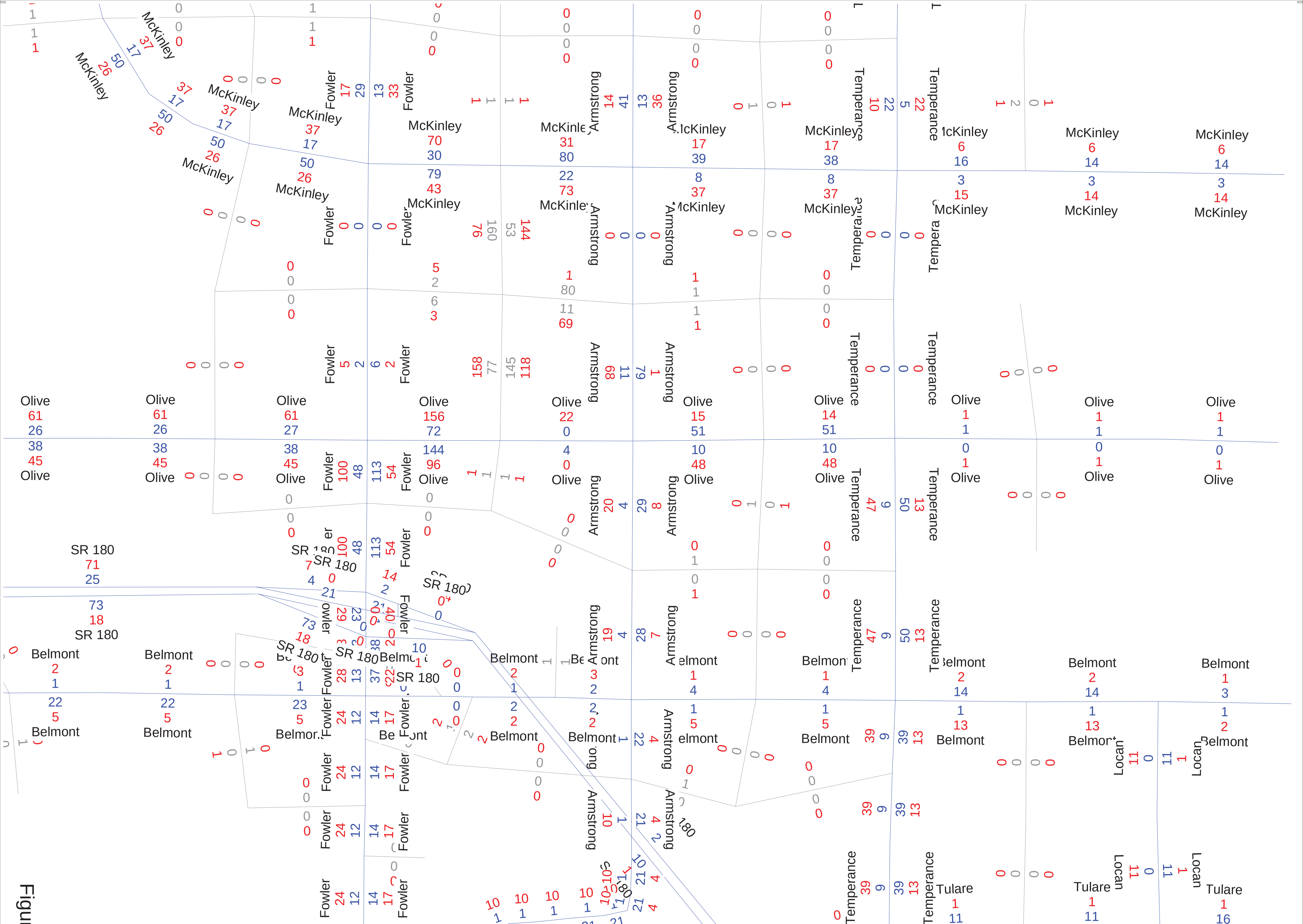
City of Fresno Traffic Study for Southeast Surface Water Treatment Facility Site

Estimated Traffic Counts for Proposed Southeast SWTF Site (for first phase of development with only the Surface Water Treatment Facility constructed and in operation @ 40 mgd)			
Time of Day	**Number of People (Vehicles) Entering Site**	**Number of People (Vehicles) Exiting Site**	**Staff Type**
8:00-9:00 am	5	2	SWTF Operations Staff reporting to work; shift change for 24-hour Operations Staff
4:00-5:00 pm	2	5	SWTF Operations Staff leaving site to go home; shift change for 24-hour Operations Staff
12:00-1:00 am	2	2	Shift change for 24-hour Operations Staff
Various Times Throughout Day (between 8:00 am and 5:00 pm)	5	5	Visitors (Water Division staff, deliveries, etc.)
Total Vehicle Trips	14	14	

Estimated Traffic Counts for Proposed Southeast SWTF Site (for second phase of development with only the Surface Water Treatment Facility constructed and in operation @ 80 mgd)			
Time of Day	**Number of People (Vehicles) Entering Site**	**Number of People (Vehicles) Exiting Site**	**Staff Type**
8:00-9:00 am	8	2	SWTF Operations Staff reporting to work; shift change for 24-hour Operations Staff
4:00-5:00 pm	2	8	SWTF Operations Staff leaving site to go home; shift change for 24-hour Operations Staff
12:00-1:00 am	2	2	Shift change for 24-hour Operations Staff
Various Times Throughout Day (between 8:00 am and 5:00 pm)	8	8	Visitors (Water Division staff, deliveries, etc.)
Total Vehicle Trips	20	20	

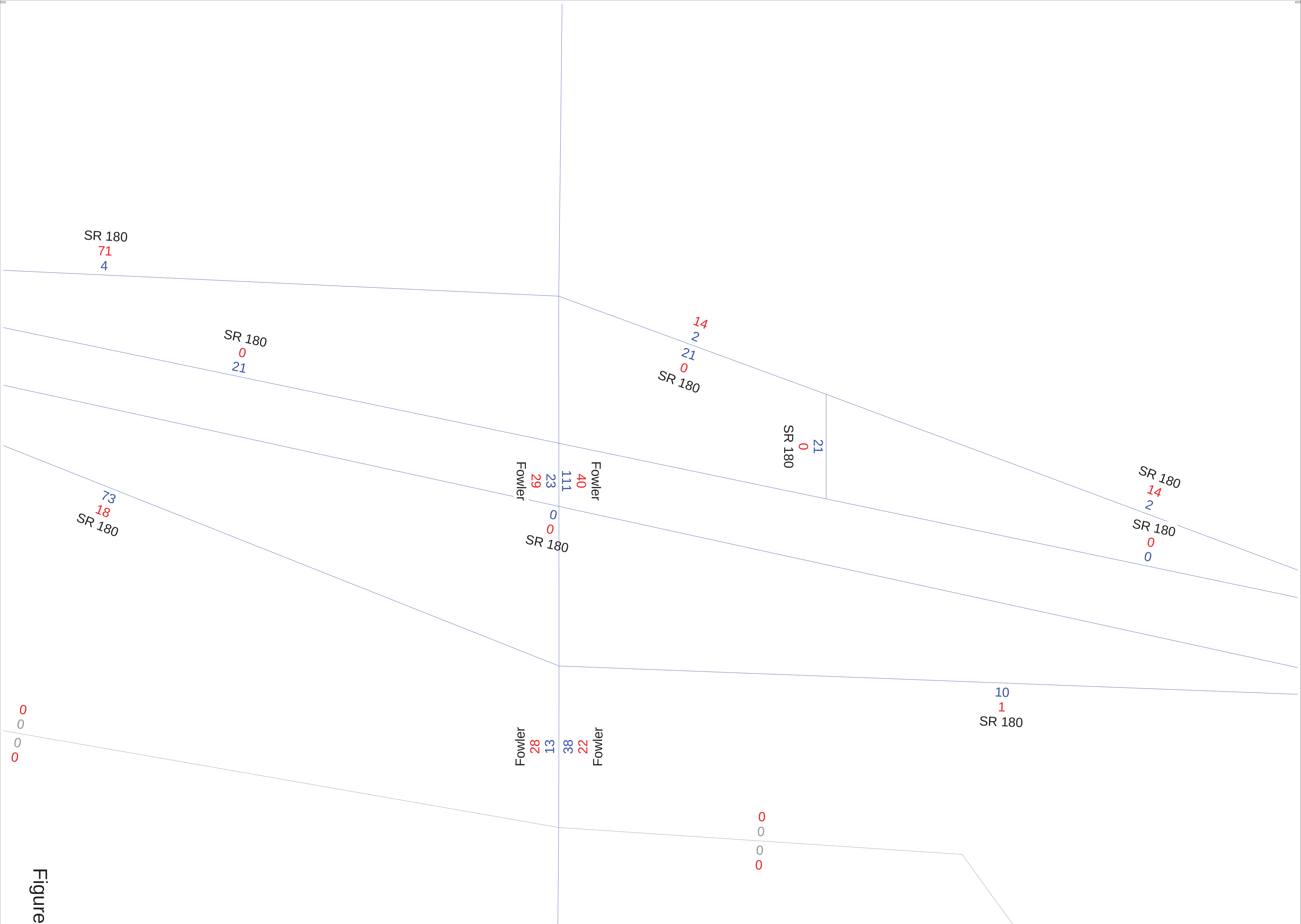
City of Fresno Traffic Study for Southeast Surface Water Treatment Facility Site

Estimated Traffic Counts for Proposed Southeast SWTF Site (at buildout of the Surface Water Treatment Facility, Corporation Yard, and Administrative Facility)			
Time of Day	**Number of People (Vehicles) Entering Site**	**Number of People (Vehicles) Exiting Site**	**Staff Type**
6:45 -7:00 am	167		Field Office, Operations and Maintenance Employees reporting to work
7:15-7:45 am		167	Field Office, Operations and Maintenance Employees leaving site to work at various facility sites throughout the City
8:00-9:00 am	78	2	Office/Admin Staff and SWTF Operations Staff reporting to work; shift change for 24-hour Operations Staff
3:00-3:30 pm	167		Field Office, Operations and Maintenance Employees returning to site
3:30 pm		167	Field Office, Operations and Maintenance Employees leaving site to go home
4:00-5:00 pm	2	78	Office/Admin Staff and SWTF Operations Staff leaving site to go home; shift change for 24-hour Operations Staff
12:00-1:00 am	2	2	Shift change for 24-hour Operations Staff
Various Times Throughout Day (between 8:00 am and 5:00 pm)	20	20	Visitors (water customers paying bills, deliveries, etc.)
Total Vehicle Trips	436	436	



Council of Fresno County Governments Travel Demand Model
Select Zone Analysis AM and PM Peak Hour Traffic Volumes

Figure 6



Council of Fresno County Governments Travel Demand Model
Select Zone Analysis AM and PM Peak Hour Traffic Volumes

Table 8.a Fowler and Floradora A.M.

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA11_8086_001 | Day: WEDNESDAY

City: City of Fresno | Date: 12/14/2011

AM

NS/EW Streets:	Fowler Ave			Fowler Ave			Floradora Ave			Floradora Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:													
7:00 AM		78	0	0	95					0		0	173
7:15 AM		87	0	1	93					1		2	184
7:30 AM		78	0	0	86					0		1	165
7:45 AM		91	1	0	83					0		1	176
8:00 AM		76	0	0	81					0		0	157
8:15 AM		76	3	0	92					0		0	171
8:30 AM		78	0	0	83					2		0	163
8:45 AM		79	3	0	90					1		1	174

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	643	7	1	703	0	0	0	0	4	0	5	1363
APPROACH %'s :	0.00%	98.92%	1.08%	0.14%	99.86%	0.00%	#DIV/0!	#DIV/0!	#DIV/0!	44.44%	0.00%	55.56%	

PEAK HR START TIME :	700 AM												TOTAL
PEAK HR VOL :	0	334	1	1	357	0	0	0	0	1	0	4	698
PEAK HR FACTOR :		0.910			0.942			0.000			0.417		0.948

CONTROL :

Table 8.b Fowler and Floradora P.M.

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA11_8086_001 | Day: WEDNESDAY

City: City of Fresno | Date: 12/14/2011

PM

NS/EW Streets:	Fowler Ave			Fowler Ave			Floradora Ave			Floradora Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:													
4:00 PM		111	1	3	110					0		0	225
4:15 PM		143	0	3	105					1		0	252
4:30 PM		137	0	4	130					1		0	272
4:45 PM		127	1	0	95					0		0	223
5:00 PM		122	1	2	116					1		1	243
5:15 PM		146	1	0	121					0		1	269
5:30 PM		144	2	0	126					4		0	276
5:45 PM		128	1	0	119					1		0	249

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	1058	7	12	922	0	0	0	0	8	0	2	2009
APPROACH %'s :	0.00%	99.34%	0.66%	1.28%	98.72%	0.00%	#DIV/0!	#DIV/0!	#DIV/0!	80.00%	0.00%	20.00%	

PEAK HR START TIME :	500 PM												TOTAL
PEAK HR VOL :	0	540	5	2	482	0	0	0	0	6	0	2	1037
PEAK HR FACTOR :		0.927			0.960			0.000			0.500		0.939

CONTROL :

Table 9.a Fowler and Olive A.M.

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA11_8086_002 | Day: WEDNESDAY

City: City of Fresno | Date: 12/14/2011

AM

NS/EW Streets:	Fowler Ave			Fowler Ave			Olive Ave			Olive Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:													
7:00 AM	7	77	13	0	92	6	1	6	0	62	22	1	287
7:15 AM	10	79	14	1	87	2	10	7	4	85	25	2	326
7:30 AM	4	68	8	0	81	2	4	10	5	112	46	4	344
7:45 AM	1	77	13	1	76	5	6	11	5	92	51	2	340
8:00 AM	2	66	20	1	68	7	6	17	1	87	29	5	309
8:15 AM	1	73	14	0	82	7	1	8	4	74	21	1	286
8:30 AM	8	67	9	4	75	12	2	5	2	42	19	5	250
8:45 AM	4	77	11	2	84	2	4	7	9	31	7	2	240

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	37	584	102	9	645	43	34	71	30	585	220	22	2382
APPROACH %'s :	5.12%	80.77%	14.11%	1.29%	92.54%	6.17%	25.19%	52.59%	22.22%	70.74%	26.60%	2.66%	

PEAK HR START TIME :	715 AM												TOTAL
PEAK HR VOL :	17	290	55	3	312	16	26	45	15	376	151	13	1319
PEAK HR FACTOR :		0.879			0.919			0.896			0.833		0.959

CONTROL :

Table 9.b Fowler and Olive P.M.

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA11_8086_002 — Day: WEDNESDAY

City: City of Fresno — Date: 12/14/2011

PM

NS/EW Streets:	Fowler Ave			Fowler Ave			Olive Ave			Olive Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:													
4:00 PM	3	91	23	2	106	4	16	20	9	22	9	1	306
4:15 PM	6	124	25	0	103	4	15	24	4	16	12	1	334
4:30 PM	4	114	30	4	118	4	18	25	12	31	14	1	375
4:45 PM	2	105	25	2	94	4	17	30	4	19	13	2	317
5:00 PM	3	108	27	0	106	7	16	30	11	28	14	0	350
5:15 PM	4	111	17	3	107	14	24	35	15	24	12	4	370
5:30 PM	3	125	26	1	115	13	22	24	10	19	13	2	373
5:45 PM	0	111	23	1	100	17	13	16	7	24	20	1	333

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	25	889	196	13	849	67	141	204	72	183	107	12	2758
APPROACH %'s :	2.25%	80.09%	17.66%	1.40%	91.39%	7.21%	33.81%	48.92%	17.27%	60.60%	35.43%	3.97%	

PEAK HR START TIME :	500 PM												TOTAL
PEAK HR VOL :	10	455	93	5	428	51	75	105	43	95	59	7	1426
PEAK HR FACTOR :		0.906			0.938			0.753			0.894		0.956

CONTROL :

Table 10.a Armstrong and Floradora A.M.

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA11_8086_003 Day: WEDNESDAY

City: City of Fresno Date: 12/14/2011

AM

NS/EW Streets:	Armstrong Ave			Armstrong Ave			Floradora Ave			Floradora Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:													
7:00 AM	0	9	0	1	61	0	0	1	0	1	1	0	74
7:15 AM	0	15	0	1	81	1	0	1	1	3	4	2	109
7:30 AM	0	14	0	1	128	0	0	0	1	4	2	0	150
7:45 AM	3	36	1	0	92	0	1	1	1	4	2	1	142
8:00 AM	0	35	1	0	62	0	1	0	1	5	1	1	107
8:15 AM	1	13	1	0	50	0	0	1	0	0	0	0	66
8:30 AM	0	9	0	0	31	0	0	0	0	0	0	1	41
8:45 AM	0	10	0	0	23	1	0	1	0	0	2	0	37

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	4	141	3	3	528	2	2	5	4	17	12	5	726
APPROACH %'s :	2.70%	95.27%	2.03%	0.56%	99.06%	0.38%	18.18%	45.45%	36.36%	50.00%	35.29%	14.71%	

PEAK HR START TIME :	715 AM												TOTAL
PEAK HR VOL :	3	100	2	2	363	1	2	2	4	16	9	4	508
PEAK HR FACTOR :		0.656			0.709			0.667			0.806		0.847

CONTROL :

Table 10.b Armstrong and Floradora P.M.

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA11_8086_003 Day: WEDNESDAY

City: City of Fresno Date: 12/14/2011

PM

NS/EW Streets:	Armstrong Ave			Armstrong Ave			Floradora Ave			Floradora Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:													
4:00 PM	0	36	1	2	18	0	1	1	1	2	0	0	62
4:15 PM	0	41	1	0	22	0	0	3	0	2	0	1	70
4:30 PM	0	43	3	0	28	0	0	3	1	1	1	3	83
4:45 PM	0	52	2	0	21	1	1	1	0	2	0	0	80
5:00 PM	0	48	2	3	27	0	1	0	1	0	0	0	82
5:15 PM	1	53	2	2	25	0	0	1	0	0	3	1	88
5:30 PM	0	45	0	0	24	0	0	1	0	1	0	1	72
5:45 PM	0	38	1	1	20	0	1	0	0	0	0	0	61

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	1	356	12	8	185	1	4	10	3	8	4	6	598
APPROACH %'s :	0.27%	96.48%	3.25%	4.12%	95.36%	0.52%	23.53%	58.82%	17.65%	44.44%	22.22%	33.33%	

PEAK HR START TIME :	430 PM												TOTAL
PEAK HR VOL :	1	196	9	5	101	1	2	5	2	3	4	4	333
PEAK HR FACTOR :		0.920			0.892			0.563			0.550		0.946

CONTROL :

Table 11.a Armstrong and Olive A.M.

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA11_8086_004 | Day: WEDNESDAY

City: City of Fresno | Date: 12/14/2011

AM

NS/EW Streets:	Armstrong Ave			Armstrong Ave			Olive Ave			Olive Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:													
7:00 AM	3	3	2	1	19	39	6	16	0	1	43	0	133
7:15 AM	6	11	2	1	29	55	5	14	0	1	51	0	175
7:30 AM	6	13	8	4	36	83	4	16	3	12	87	0	272
7:45 AM	13	26	14	5	33	58	8	23	2	13	67	4	266
8:00 AM	11	21	21	11	21	37	11	20	5	8	81	6	253
8:15 AM	9	5	6	2	12	38	5	16	0	9	45	3	150
8:30 AM	7	7	2	0	8	24	3	12	1	3	35	1	103
8:45 AM	3	2	0	1	7	15	9	9	2	1	19	0	68
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	58	88	55	25	165	349	51	126	13	48	428	14	1420
APPROACH %'s :	28.86%	43.78%	27.36%	4.64%	30.61%	64.75%	26.84%	66.32%	6.84%	9.80%	87.35%	2.86%	
PEAK HR START TIME :	715 AM												TOTAL
PEAK HR VOL :	36	71	45	21	119	233	28	73	10	34	286	10	966
PEAK HR FACTOR :		0.717			0.758			0.771			0.833		0.888

CONTROL :

Table 11.b Armstrong and Olive P.M.

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA11_8086_004 Day: WEDNESDAY

City: City of Fresno Date: 12/14/2011

PM

NS/EW Streets:	Armstrong Ave			Armstrong Ave			Olive Ave			Olive Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:													
4:00 PM	2	23	1	4	10	8	19	21	2	1	23	0	114
4:15 PM	1	22	5	2	7	12	15	24	4	0	21	2	115
4:30 PM	1	23	7	3	11	18	23	39	0	1	21	2	149
4:45 PM	2	26	9	0	9	10	20	34	0	0	22	1	133
5:00 PM	2	32	4	1	13	7	22	34	1	4	24	1	145
5:15 PM	0	28	1	2	11	12	23	32	0	2	21	3	135
5:30 PM	2	23	2	1	10	15	20	30	1	3	18	0	125
5:45 PM	9	24	12	2	10	10	13	25	5	7	20	0	137

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	19	201	41	15	81	92	155	239	13	18	170	9	1053
APPROACH %'s :	7.28%	77.01%	15.71%	7.98%	43.09%	48.94%	38.08%	58.72%	3.19%	9.14%	86.29%	4.57%	

PEAK HR START TIME :	430 PM												TOTAL
PEAK HR VOL :	5	109	21	6	44	47	88	139	1	7	88	7	562
PEAK HR FACTOR :		0.888			0.758			0.919			0.879		0.943

CONTROL :

Responses to Scoping Letter

Fresno All-America City 2000

City of FRESNO

City Hall 559-621-8800
2600 Fresno Street, Rm. 4064
Fresno, CA 93721-3623
www.fresno.gov

Public Works Department
Patrick Wiemiller, Director

April 24, 2012

Peters Engineering Group
John Rowland, PE, TE
952 Pollasky Avenue
Clovis, CA 93612

SUBJECT: REVIEW OF THE SCOPE OF TRAFFIC IMPACT STUDY FOR THE PROPOSED CITY OF FRESNO SOUTHEAST SURFACE WATER TREATMENT FACILITY LOCATED AT THE NORTHWEST INTERSECTION OF ARMSTRONG AND OLIVE AVENUES DATED MARCH 29, 2012

We have reviewed the scope of work for the Traffic Impact Study (TIS) for the proposed City of Fresno Southeast Surface Water Treatment Facility (Project), located at the northwest intersection of Armstrong and Olive Avenues. The TIS will be utilized in the Environmental Impact Report (EIR) being prepared for this Project. The following comments are from Traffic Engineering staff's review of the scope of work.

COMMENTS

1. Trip generation for the TIS will be prepared using information provided by West Yost Associates. The proposed Project Trip Generation shown in Table 1 includes trips associated with employees entering and exiting the site during the AM and PM peak hours but excludes the trips associated with visitors. The Trip Generation shown in Table 1 will need to be revised to include a portion of the visitor trips entering and exiting the Project site in the AM and PM peak hours.

2. The scope of work includes a Project trip distribution that shows the majority of the Project trips traveling westbound/eastbound on State Route 180. We would expect more Project trips than shown in the trip distribution to travel on City roadways. Please review the trip distribution and revise accordingly.

3. The TIS should include a queuing analysis of all left-turn, through, and right-turn movements at the study intersections and identify any queue that exceeds the available storage by 25 feet or more. Mitigations for any queue exceedances should be included in the TIS.

4. The City of Fresno is in the process of a General Plan Amendment for the realignment of McKinley Avenue that should be considered in the TIS.

If you have any further questions regarding this matter, please contact me at (559) 621-8792 or jill.gormley@fresno.gov .

Sincerely,

Jill Gormley

Jill Gormley, TE
Assistant Traffic Engineering Manager
Public Works Department, Traffic & Engineering Services

C: Traffic Engineering Reading File
Scott Tyler, PE, City Traffic Engineer
Mike Sanchez, Planning & Development Dept.

John Rowland

From: Kooner, Harpreet [HKooner@co.fresno.ca.us]
Sent: Thursday, May 24, 2012 7:51 AM
To: John Rowland; Robertson, John
Subject: RE: Traffic Study Scope Letter - Proposed City of Fresno Southeast Surface Water Treatment Facility

John,
No comments from County.
Harpreet

Harpreet Kooner
Department of Public Works and Planning
2220 Tulare Street, 6th Floor (Mailing Address)
Fresno, CA 93721
(559) 600-4533
E-mail: hkooner@co.fresno.ca.us
If you would like to take a moment to complete a customer service survey, please click on the following link:

Customer Service Survey

From: John Rowland [mailto:JohnRowland@peters-engineering.com]
Sent: Wednesday, May 23, 2012 11:30 AM
To: Robertson, John; Kooner, Harpreet
Subject: FW: Traffic Study Scope Letter - Proposed City of Fresno Southeast Surface Water Treatment Facility

John and Harpreet,

I don't think I ever heard back from the County on the attached letter and the emails below. We'll be trying to wrap up the study soon. Thanks.

John Rowland

From: John Rowland
Sent: Friday, April 20, 2012 11:46 AM
To: 'Robertson, John'
Cc: Kooner, Harpreet
Subject: FW: Traffic Study Scope Letter - Proposed City of Fresno Southeast Surface Water Treatment Facility

John and Harpreet,

Our client has asked me to follow up on the attached letter. Caltrans has agreed with the scope and has not requested any additional analyses. Will you be able to provide written comments soon?

Thanks,

John Rowland

From: John Rowland
Sent: Thursday, March 29, 2012 2:09 PM

To: 'Jill Gormley'; Scott Tyler; Robertson, John; 'Michael Navarro'; 'Kennix, Marvin L.'
Cc: Brock Buche; 'Elizabeth Drayer'
Subject: Traffic Study Scope Letter - Proposed City of Fresno Southeast Surface Water Treatment Facility

To all,

The purpose of the attached letter is to provide your agency the opportunity to comment on the scope of the traffic impact study to be prepared for the project. We are requesting that you respond in writing as soon as possible. Please let me know if you have any questions.

Thanks,

John Rowland, PE, TE
PETERS ENGINEERING GROUP
952 Pollasky Avenue
Clovis, California 93612
Phone: (559) 299-1544 Ext. 112
Fax: (559) 299-1722

John Rowland

From: Michael Navarro [michael_navarro@dot.ca.gov]
Sent: Monday, April 02, 2012 2:31 PM
To: John Rowland
Subject: Re: Traffic Study Scope Letter - Proposed City of Fresno Southeast Surface Water Treatment Facility
Attachments: SWTF Traffic Scope Letter (3-29-12).pdf

I have no comments on the scope. thanks.

John Rowland
<JohnRowland@peters-engineering.com>

03/29/2012 02:09 PM

To
Jill Gormley <Jill.Gormley@fresno.gov>, Scott Tyler <Scott.Tyler@fresno.gov>, "Robertson, John" <jrobertson@co.fresno.ca.us>, Michael Navarro <michael_navarro@dot.ca.gov>, "Kennix, Marvin L." <marvin.kennix@cpuc.ca.gov>

cc
Brock Buche <Brock.Buche@fresno.gov>, Elizabeth Drayer <edrayer@westyost.com>

Subject
Traffic Study Scope Letter - Proposed City of Fresno Southeast Surface Water Treatment Facility

To all,

The purpose of the attached letter is to provide your agency the opportunity to comment on the scope of the traffic impact study to be prepared for the project. We are requesting that you respond in writing as soon as possible. Please let me know if you have any questions.

Thanks,

John Rowland, PE, TE
Peters Engineering Group
952 Pollasky Avenue
Clovis, California 93612
Phone: (559) 299-1544 Ext. 112

Fax: (559) 299-1722
(See attached file: SWTF Traffic Scope Letter (3-29-12).pdf)

John Rowland

From: Kennix, Marvin L. [marvin.kennix@cpuc.ca.gov]
Sent: Thursday, March 29, 2012 2:57 PM
To: John Rowland
Subject: RE: Traffic Study Scope Letter - Proposed City of Fresno Southeast Surface Water Treatment Facility

Hello John:

I didn't see where there is any discussion in your report regarding the impact of the project on the railroad crossing across Olive Avenue adjacent to the Olive Avenue/Clovis Avenue intersection. This intersection is already very busy with vehicle traffic and it seems like it will be a likely route for vehicles, especially large trucks enroute to the proposed facility. There is a very short distance between the the track and the Clovis/Olive Avenue intersection and although I know there is not much train traffic at this crossing, I am concerned that the proposed facility will cause an increase in large 18- wheel truck traffic that can potentially foul the track while stopped for a red light. I suggest that a pre-signal (stopping vehicles east of the track) new rail crossing warning devices with gates, and an upgrading of the railroad preemption (if there is none, it should be installed) be considered.

Thanks,

Marvin Kennix
Utilities Engineer
CPUC

From: John Rowland [mailto:JohnRowland@peters-engineering.com]
Sent: Thursday, March 29, 2012 2:09 PM
To: Jill Gormley; Scott Tyler; Robertson, John; Michael Navarro; Kennix, Marvin L.
Cc: Brock Buche; Elizabeth Drayer
Subject: Traffic Study Scope Letter - Proposed City of Fresno Southeast Surface Water Treatment Facility

To all,

The purpose of the attached letter is to provide your agency the opportunity to comment on the scope of the traffic impact study to be prepared for the project. We are requesting that you respond in writing as soon as possible. Please let me know if you have any questions.

Thanks,

John Rowland, PE, TE
PETERS ENGINEERING GROUP
952 Pollasky Avenue
Clovis, California 93612
Phone: (559) 299-1544 Ext. 112
Fax: (559) 299-1722

APPENDIX B

ROADWAY LEVEL OF SERVICE ANALYSES
AND FLORIDA TABLES

Road Segment Calculations

SEGMENT	LANES	LENGTH (mile)	SIGNALS	SIGNALS/ MILE	DIVIDED	LEFT TURN	RIGHT TURN	Condition	Florida Table	Florida Table LOS Criteria				Existing AM			Existing Plus Phases 1-2 AM			
										B	C	D	E	Volume	LOS	v/c	Volume	LOS	v/c	Δ v/c
Fowler Avenue Between Floradora and Olive	2	0.25	0	<1 99	No	No	No	Transitioning	5	774	1,233	1,332	***	693	B	0.52	693	B	0.52	0.00
Armstrong Avenue Between Floradora and Olive	2	0.25	0	<1 99	No	No	No	Transitioning	5	774	1,233	1,332	***	488	B	0.37	488	B	0.37	0.00
Floradora Avenue Between Fowler and Armstrong	2	0.5	1	2.00	No	No	No	Transitioning	5	**	819	1,197	1,278	21	C	0.02	21	C	0.02	0.00
Olive Avenue Between Fowler and Armstrong	2	0.5	1	2.00	No	No	No	Transitioning	5	**	819	1,197	1,278	666	C	0.52	666	C	0.52	0.00

SEGMENT	LANES	LENGTH (mile)	SIGNALS	SIGNALS/ MILE	DIVIDED	LEFT TURN	RIGHT TURN	Condition	Florida Table	Florida Table LOS Criteria				Existing PM			Existing Plus Phases 1-2 PM			
										B	C	D	E	Volume	LOS	v/c	Volume	LOS	v/c	Δ v/c
Fowler Avenue Between Floradora and Olive	2	0.25	0	<1 99	No	No	No	Transitioning	5	774	1,233	1,332	***	1,033	C	0.78	1,033	C	0.78	0.00
Armstrong Avenue Between Floradora and Olive	2	0.25	0	<1 99	No	No	No	Transitioning	5	774	1,233	1,332	***	312	B	0.23	312	B	0.23	0.00
Floradora Avenue Between Fowler and Armstrong	2	0.5	1	2.00	No	No	No	Transitioning	5	**	819	1,197	1,278	15	C	0.01	15	C	0.01	0.00
Olive Avenue Between Fowler and Armstrong	2	0.5	1	2.00	No	No	No	Transitioning	5	**	819	1,197	1,278	368	C	0.29	375	C	0.29	0.01

Road Segment Calculations

SEGMENT	LANES	LENGTH (mile)	SIGNALS	SIGNALS/ MILE	DIVIDED	LEFT TURN	RIGHT TURN	Condition	Florida Table	Florida Table LOS Criteria				Existing AM			Existing Plus Project AM			
										B	C	D	E	Volume	LOS	v/c	Volume	LOS	v/c	Δ v/c
Fowler Avenue Between Floradora and Olive	2	0.25	0	<1 99	No	No	No	Transitioning	5	774	1,233	1,332	***	693	B	0.52	758	B	0.57	0.05
Armstrong Avenue Between Floradora and Olive	2	0.25	0	<1 99	No	No	No	Transitioning	5	774	1,233	1,332	***	488	B	0.37	492	B	0.37	0.00
Floradora Avenue Between Fowler and Armstrong	2	0.5	1	2.00	No	No	No	Transitioning	5	**	819	1,197	1,278	21	C	0.02	91	C	0.07	0.05
Olive Avenue Between Fowler and Armstrong	2	0.5	1	2.00	No	No	No	Transitioning	5	**	819	1,197	1,278	666	C	0.52	791	C	0.62	0.10

SEGMENT	LANES	LENGTH (mile)	SIGNALS	SIGNALS/ MILE	DIVIDED	LEFT TURN	RIGHT TURN	Condition	Florida Table	Florida Table LOS Criteria				Existing PM			Existing Plus Project PM			
										B	C	D	E	Volume	LOS	v/c	Volume	LOS	v/c	Δ v/c
Fowler Avenue Between Floradora and Olive	2	0.25	0	<1 99	No	No	No	Transitioning	5	774	1,233	1,332	***	1,033	C	0.78	1,055	C	0.79	0.02
Armstrong Avenue Between Floradora and Olive	2	0.25	0	<1 99	No	No	No	Transitioning	5	774	1,233	1,332	***	312	B	0.23	314	B	0.24	0.00
Floradora Avenue Between Fowler and Armstrong	2	0.5	1	2.00	No	No	No	Transitioning	5	**	819	1,197	1,278	15	C	0.01	42	C	0.03	0.02
Olive Avenue Between Fowler and Armstrong	2	0.5	1	2.00	No	No	No	Transitioning	5	**	819	1,197	1,278	368	C	0.29	417	C	0.33	0.04

Road Segment Calculations

SEGMENT	LANES	LENGTH (mile)	SIGNALS	SIGNALS/ MILE	DIVIDED	LEFT TURN	RIGHT TURN	Condition	Florida Table	Florida Table LOS Criteria				Existing AM			Near Term Plus Phases 1-2 AM			
										B	C	D	E	Volume	LOS	v/c	Volume	LOS	v/c	Δ v/c
Fowler Avenue Between Floradora and Olive	2	0.25	0	<1 99	No	No	No	Transitioning	5	774	1,233	1,332	***	693	B	0.52	934	C	0.70	0.18
Armstrong Avenue Between Floradora and Olive	2	0.25	0	<1 99	No	No	No	Transitioning	5	774	1,233	1,332	***	488	B	0.37	515	B	0.39	0.02
Floradora Avenue Between Fowler and Armstrong	2	0.5	1	2.00	No	No	No	Transitioning	5	**	819	1,197	1,278	21	C	0.02	22	C	0.02	0.00
Olive Avenue Between Fowler and Armstrong	2	0.5	1	2.00	No	No	No	Transitioning	5	**	819	1,197	1,278	666	C	0.52	718	C	0.56	0.04

SEGMENT	LANES	LENGTH (mile)	SIGNALS	SIGNALS/ MILE	DIVIDED	LEFT TURN	RIGHT TURN	Condition	Florida Table	Florida Table LOS Criteria				Existing PM			Near Term Plus Phases 1-2 PM			
										B	C	D	E	Volume	LOS	v/c	Volume	LOS	v/c	Δ v/c
Fowler Avenue Between Floradora and Olive	2	0.25	0	<1 99	No	No	No	Transitioning	5	774	1,233	1,332	***	1,033	C	0.78	**1,424**	**E**	1.07	**0.29**
Armstrong Avenue Between Floradora and Olive	2	0.25	0	<1 99	No	No	No	Transitioning	5	774	1,233	1,332	***	312	B	0.23	335	B	0.25	0.02
Floradora Avenue Between Fowler and Armstrong	2	0.5	1	2.00	No	No	No	Transitioning	5	**	819	1,197	1,278	15	C	0.01	16	C	0.01	0.00
Olive Avenue Between Fowler and Armstrong	2	0.5	1	2.00	No	No	No	Transitioning	5	**	819	1,197	1,278	368	C	0.29	441	C	0.35	0.06

Road Segment Calculations

SEGMENT	LANES	LENGTH (mile)	SIGNALS	SIGNALS/ MILE	DIVIDED	LEFT TURN	RIGHT TURN	Condition	Florida Table	Florida Table LOS Criteria				Existing AM			Near Term Plus Project AM			
										B	C	D	E	Volume	LOS	v/c	Volume	LOS	v/c	Δ v/c
Fowler Avenue Between Floradora and Olive	2	0.25	0	<1 99	No	No	No	Transitioning	5	774	1,233	1,332	***	693	B	0.52	999	C	0.75	0.23
Armstrong Avenue Between Floradora and Olive	2	0.25	0	<1 99	No	No	No	Transitioning	5	774	1,233	1,332	***	488	B	0.37	519	B	0.39	0.02
Floradora Avenue Between Fowler and Armstrong	2	0.5	1	2.00	No	No	No	Transitioning	5	**	819	1,197	1,278	21	C	0.02	91	C	0.07	0.05
Olive Avenue Between Fowler and Armstrong	2	0.5	1	2.00	No	No	No	Transitioning	5	**	819	1,197	1,278	666	C	0.52	842	C	0.66	0.14

SEGMENT	LANES	LENGTH (mile)	SIGNALS	SIGNALS/ MILE	DIVIDED	LEFT TURN	RIGHT TURN	Condition	Florida Table	Florida Table LOS Criteria				Existing PM			Near Term Plus Project PM			
										B	C	D	E	Volume	LOS	v/c	Volume	LOS	v/c	Δ v/c
Fowler Avenue Between Floradora and Olive	2	0.25	0	<1 99	No	No	No	Transitioning	5	774	1,233	1,332	***	1,033	C	0.78	**1,446**	**E**	1.09	**0.31**
Armstrong Avenue Between Floradora and Olive	2	0.25	0	<1 99	No	No	No	Transitioning	5	774	1,233	1,332	***	312	B	0.23	337	B	0.25	0.02
Floradora Avenue Between Fowler and Armstrong	2	0.5	1	2.00	No	No	No	Transitioning	5	**	819	1,197	1,278	15	C	0.01	42	C	0.03	0.02
Olive Avenue Between Fowler and Armstrong	2	0.5	1	2.00	No	No	No	Transitioning	5	**	819	1,197	1,278	368	C	0.29	483	C	0.38	0.09

Road Segment Calculations

SEGMENT	LANES	LENGTH (mile)	SIGNALS	SIGNALS/ MILE	DIVIDED	LEFT TURN	RIGHT TURN	Condition	Florida Table	Florida Table LOS Criteria				2035 No Project AM			2035 With Project AM			
										B	C	D	E	Volume	LOS	v/c	Volume	LOS	v/c	Δ v/c
Fowler Avenue Between Floradora and Olive	2	0.25	0	<1 99	No	No	No	Transitioning	5	774	1,233	1,332	***	2,280	E	1.71	2,345	E	1.76	0.05
Armstrong Avenue Between Floradora and Olive	2	0.25	0	<1 99	No	No	No	Transitioning	5	774	1,233	1,332	***	1,801	E	1.35	1,805	E	1.36	0.00
Floradora Avenue Between Fowler and Armstrong	2	0.5	1	2.00	No	No	No	Transitioning	5	**	819	1,197	1,278	42	C	0.03	98	C	0.08	0.04
Olive Avenue Between Fowler and Armstrong	2	0.5	1	2.00	No	No	No	Transitioning	5	**	819	1,197	1,278	1,385	F	1.08	1,533	F	1.20	0.12

SEGMENT	LANES	LENGTH (mile)	SIGNALS	SIGNALS/ MILE	DIVIDED	LEFT TURN	RIGHT TURN	Condition	Florida Table	Florida Table LOS Criteria				2035 No Project PM			2035 With Project PM			
										B	C	D	E	Volume	LOS	v/c	Volume	LOS	v/c	Δ v/c
Fowler Avenue Between Floradora and Olive	2	0.25	0	<1 99	No	No	No	Transitioning	5	774	1,233	1,332	***	2,764	E	2.08	2,786	E	2.09	0.02
Armstrong Avenue Between Floradora and Olive	2	0.25	0	<1 99	No	No	No	Transitioning	5	774	1,233	1,332	***	1,830	E	1.37	1,832	E	1.38	0.00
Floradora Avenue Between Fowler and Armstrong	2	0.5	1	2.00	No	No	No	Transitioning	5	**	819	1,197	1,278	30	C	0.02	57	C	0.04	0.02
Olive Avenue Between Fowler and Armstrong	2	0.5	1	2.00	No	No	No	Transitioning	5	**	819	1,197	1,278	1,466	F	1.15	1,519	F	1.19	0.04

Road Segment Calculations
(McKinley Realignment)

SEGMENT	LANES	LENGTH (mile)	SIGNALS	SIGNALS/ MILE	DIVIDED	LEFT TURN	RIGHT TURN	Condition	Florida Table	Florida Table LOS Criteria				2035 No Project AM			2035 With Project AM			
										B	C	D	E	Volume	LOS	v/c	Volume	LOS	v/c	Δ v/c
Fowler Avenue Between Floradora and Olive	2	0.25	0	<1 99	No	No	No	Transitioning	5	774	1,233	1,332	***	2,407	E	1.81	2,468	E	1.85	0.05
Armstrong Avenue Between Floradora and Olive	2	0.25	0	<1 99	No	No	No	Transitioning	5	774	1,233	1,332	***	1,801	E	1.35	1,805	E	1.36	0.00
Floradora Avenue Between Fowler and Armstrong	2	0.5	1	2.00	No	No	No	Transitioning	5	**	819	1,197	1,278	856	D	0.67	940	D	0.74	0.07
Olive Avenue Between Fowler and Armstrong	2	0.5	1	2.00	No	No	No	Transitioning	5	**	819	1,197	1,278	1,385	F	1.08	1,533	F	1.20	0.12

SEGMENT	LANES	LENGTH (mile)	SIGNALS	SIGNALS/ MILE	DIVIDED	LEFT TURN	RIGHT TURN	Condition	Florida Table	Florida Table LOS Criteria				2035 No Project PM			2035 With Project PM			
										B	C	D	E	Volume	LOS	v/c	Volume	LOS	v/c	Δ v/c
Fowler Avenue Between Floradora and Olive	2	0.25	0	<1 99	No	No	No	Transitioning	5	774	1,233	1,332	***	2,749	E	2.06	2,770	E	2.08	0.02
Armstrong Avenue Between Floradora and Olive	2	0.25	0	<1 99	No	No	No	Transitioning	5	774	1,233	1,332	***	1,854	E	1.39	1,856	E	1.39	0.00
Floradora Avenue Between Fowler and Armstrong	2	0.5	1	2.00	No	No	No	Transitioning	5	**	819	1,197	1,278	1,019	D	0.80	1,046	D	0.82	0.02
Olive Avenue Between Fowler and Armstrong	2	0.5	1	2.00	No	No	No	Transitioning	5	**	819	1,197	1,278	1,466	F	1.15	1,519	F	1.19	0.04

Road Segment Calculations
(Mitigated)

SEGMENT	LANES	LENGTH (mile)	SIGNALS	SIGNALS/ MILE	DIVIDED	LEFT TURN	RIGHT TURN	Condition	Florida Table	Florida Table LOS Criteria				Near Term Plus Phases 1-2 AM		
										B	C	D	E	Volume	LOS	v/c
Fowler Avenue Between Floradora and Olive	4	0.25	0	<1.99	Yes	Yes	No	Transitioning	5	2,340	2,799	2,952	***	934	B	0 32
Armstrong Avenue Between Floradora and Olive	2	0.25	0	<1.99	No	No	No	Transitioning	5	774	1,233	1,332	***	515	B	0 39
Floradora Avenue Between Fowler and Armstrong	2	0.5	1	2.00	No	No	No	Transitioning	5	**	819	1,197	1,278	22	C	0.02
Olive Avenue Between Fowler and Armstrong	2	0.5	1	2.00	No	No	No	Transitioning	5	**	819	1,197	1,278	718	C	0 56

SEGMENT	LANES	LENGTH (mile)	SIGNALS	SIGNALS/ MILE	DIVIDED	LEFT TURN	RIGHT TURN	Condition	Florida Table	Florida Table LOS Criteria				Near Term Plus Phases 1-2 PM		
										B	C	D	E	Volume	LOS	v/c
Fowler Avenue Between Floradora and Olive	4	0.25	0	<1.99	Yes	Yes	No	Transitioning	5	2,340	2,799	2,952	***	1,424	B	0.48
Armstrong Avenue Between Floradora and Olive	2	0.25	0	<1.99	No	No	No	Transitioning	5	774	1,233	1,332	***	335	B	0 25
Floradora Avenue Between Fowler and Armstrong	2	0.5	1	2.00	No	No	No	Transitioning	5	**	819	1,197	1,278	16	C	0.01
Olive Avenue Between Fowler and Armstrong	2	0.5	1	2.00	No	No	No	Transitioning	5	**	819	1,197	1,278	441	C	0 35

Road Segment Calculations
(Mitigated)

SEGMENT	LANES	LENGTH (mile)	SIGNALS	SIGNALS/ MILE	DIVIDED	LEFT TURN	RIGHT TURN	Condition	Florida Table	Florida Table LOS Criteria				Near Term Plus Project AM		
										B	C	D	E	Volume	LOS	v/c
Fowler Avenue Between Floradora and Olive	4	0.25	0	<1.99	Yes	Yes	No	Transitioning	5	2,340	2,799	2,952	***	999	B	0 34
Armstrong Avenue Between Floradora and Olive	2	0.25	0	<1.99	No	No	No	Transitioning	5	774	1,233	1,332	***	519	B	0 39
Floradora Avenue Between Fowler and Armstrong	2	0.5	1	2.00	No	No	No	Transitioning	5	**	819	1,197	1,278	91	C	0.07
Olive Avenue Between Fowler and Armstrong	2	0.5	1	2.00	No	No	No	Transitioning	5	**	819	1,197	1,278	842	C	0.66

SEGMENT	LANES	LENGTH (mile)	SIGNALS	SIGNALS/ MILE	DIVIDED	LEFT TURN	RIGHT TURN	Condition	Florida Table	Florida Table LOS Criteria				Near Term Plus Project PM		
										B	C	D	E	Volume	LOS	v/c
Fowler Avenue Between Floradora and Olive	4	0.25	0	<1.99	Yes	Yes	No	Transitioning	5	2,340	2,799	2,952	***	1,446	B	0.49
Armstrong Avenue Between Floradora and Olive	2	0.25	0	<1.99	No	No	No	Transitioning	5	774	1,233	1,332	***	337	B	0 25
Floradora Avenue Between Fowler and Armstrong	2	0.5	1	2.00	No	No	No	Transitioning	5	**	819	1,197	1,278	42	C	0.03
Olive Avenue Between Fowler and Armstrong	2	0.5	1	2.00	No	No	No	Transitioning	5	**	819	1,197	1,278	483	C	0 38

Road Segment Calculations
(General Plan Configuration)

SEGMENT	LANES	LENGTH (mile)	SIGNALS	SIGNALS/ MILE	DIVIDED	LEFT TURN	RIGHT TURN	Condition	Florida Table	Florida Table LOS Criteria				2035 With Project AM		
										B	C	D	E	Volume	LOS	v/c
Fowler Avenue Between Floradora and Olive	4	0.25	1	2.00	Yes	Yes	Yes	Urban	4	**	2,286	3,042	3,213	2,345	D	0.73
Armstrong Avenue Between Floradora and Olive	2	0.25	1	2.00	Yes	Yes	Yes	Urban	4	**	903	1,320	1,409	1,805	F	1 28
	4	0.25	1	2.00	No	Yes	No	Urban	4	**	2,069	2,753	2,907	1,805	C	0.62
Floradora Avenue Between Fowler and Armstrong	2	0.5	1	2.00	No	No	No	Urban	4	**	918	1,332	1,413	98	C	0.07
Olive Avenue Between Fowler and Armstrong	2	0.5	1	2.00	Yes	Yes	Yes	Urban	4	**	903	1,320	1,409	1,805	F	1 28
	4	0.5	1	2.00	No	Yes	No	Urban	4	**	2,069	2,753	2,907	1,805	C	0.62

SEGMENT	LANES	LENGTH (mile)	SIGNALS	SIGNALS/ MILE	DIVIDED	LEFT TURN	RIGHT TURN	Condition	Florida Table	Florida Table LOS Criteria				2035 With Project PM		
										B	C	D	E	Volume	LOS	v/c
Fowler Avenue Between Floradora and Olive	4	0.25	1	2.00	Yes	Yes	Yes	Urban	4	**	2,286	3,042	3,213	2,786	D	0 87
Armstrong Avenue Between Floradora and Olive	2	0.25	1	2.00	Yes	Yes	Yes	Urban	4	**	903	1,320	1,409	1,832	F	1 30
	4	0.25	1	2.00	No	Yes	No	Urban	4	**	2,069	2,753	2,907	1,832	C	0.63
Floradora Avenue Between Fowler and Armstrong	2	0.5	1	2.00	No	No	No	Urban	4	**	918	1,332	1,413	57	C	0.04
Olive Avenue Between Fowler and Armstrong	2	0.5	1	2.00	Yes	Yes	Yes	Urban	4	**	903	1,320	1,409	1,519	F	1.08
	4	0.5	1	2.00	No	Yes	No	Urban	4	**	2,069	2,753	2,907	1,519	C	0 52

Road Segment Calculations
(McKinley Realignment)
(General Plan Configuration)

SEGMENT	LANES	LENGTH (mile)	SIGNALS	SIGNALS/ MILE	DIVIDED	LEFT TURN	RIGHT TURN	Condition	Florida Table	Florida Table LOS Criteria				2035 With Project AM		
										B	C	D	E	Volume	LOS	v/c
Fowler Avenue Between Floradora and Olive	4	0.25	1	2.00	Yes	Yes	Yes	Urban	4	**	2,286	3,042	3,213	2,468	D	0.77
Armstrong Avenue Between Floradora and Olive	2	0.25	1	2.00	Yes	Yes	Yes	Urban	4	**	903	1,320	1,409	1,805	F	1 28
	4	0.25	1	2.00	No	Yes	No	Urban	4	**	2,069	2,753	2,907	1,805	C	0.62
Floradora (McKinley) Avenue Between Fowler and Armstrong	2	0.5	1	2.00	Yes	Yes	Yes	Urban	4	**	903	1,320	1,409	940	D	0.67
Olive Avenue Between Fowler and Armstrong	2	0.5	1	2.00	Yes	Yes	Yes	Urban	4	**	903	1,320	1,409	1,533	F	1.09
	4	0.5	1	2.00	No	Yes	No	Urban	4	**	2,069	2,753	2,907	1,533	C	0 53

SEGMENT	LANES	LENGTH (mile)	SIGNALS	SIGNALS/ MILE	DIVIDED	LEFT TURN	RIGHT TURN	Condition	Florida Table	Florida Table LOS Criteria				2035 With Project PM		
										B	C	D	E	Volume	LOS	v/c
Fowler Avenue Between Floradora and Olive	4	0.25	1	2.00	Yes	Yes	Yes	Urban	4	**	2,286	3,042	3,213	2,468	D	0.77
Armstrong Avenue Between Floradora and Olive	2	0.25	1	2.00	Yes	Yes	Yes	Urban	4	**	903	1,320	1,409	1,856	F	1 32
	4	0.25	1	2.00	No	Yes	No	Urban	4	**	2,069	2,753	2,907	1,856	C	0.64
Floradora (McKinley) Avenue Between Fowler and Armstrong	2	0.5	1	2.00	Yes	Yes	Yes	Urban	4	**	903	1,320	1,409	1,046	D	0.74
Olive Avenue Between Fowler and Armstrong	2	0.5	1	2.00	Yes	Yes	Yes	Urban	4	**	903	1,320	1,409	1,519	F	1.08
	4	0.5	1	2.00	No	Yes	No	Urban	4	**	2,069	2,753	2,907	1,519	C	0 52

TABLE 4

Generalized **Peak Hour Two-Way** Volumes for Florida's **Urbanized Areas**[1]

10/4/10

STATE SIGNALIZED ARTERIALS

Class I (>0.00 to 1.99 signalized intersections per mile)

Lanes	Median	B	C	D	E
2	Undivided	930	1,500	1,600	***
4	Divided	2,840	3,440	3,560	***
6	Divided	4,370	5,200	5,360	***
8	Divided	5,900	6,970	7,160	***

Class II (2.00 to 4.50 signalized intersections per mile)

Lanes	Median	B	C	D	E
2	Undivided	**	1,020	1,480	1,570
4	Divided	**	2,420	3,220	3,400
6	Divided	**	3,790	4,880	5,150
8	Divided	**	5,150	6,530	6,880

Class III/IV (more than 4.50 signalized intersections per mile)

Lanes	Median	B	C	D	E
2	Undivided	**	500	1,150	1,440
4	Divided	**	1,220	2,730	3,100
6	Divided	**	1,910	4,240	4,680
8	Divided	**	2,620	5,770	6,280

Non-State Signalized Roadway Adjustments

(Alter corresponding state volumes by the indicated percent.)

Major City/County Roadways	- 10%
Other Signalized Roadways	- 35%

State & Non-State Signalized Roadway Adjustments

(Alter corresponding state volumes by the indicated percent.)

Divided/Undivided & Turn Lane Adjustments

Lanes	Median	Exclusive Left Lanes	Exclusive Right Lanes	Adjustment Factors
2	Divided	Yes	No	+5%
2	Undivided	No	No	-20%
Multi	Undivided	Yes	No	-5%
Multi	Undivided	No	No	-25%
–	–	–	Yes	+ 5%

One-Way Facility Adjustment

Multiply the corresponding two-directional volumes in this table by 0.6.

FREEWAYS

Lanes	B	C	D	E
4	4,000	5,500	6,770	7,300
6	6,000	8,320	10,150	11,290
8	8,000	11,050	13,480	15,270
10	10,000	13,960	16,930	19,250
12	13,730	18,600	21,950	23,230

Freeway Adjustments

Auxiliary Lanes	Ramp Metering
+ 1,800	+ 5%

UNINTERRUPTED FLOW HIGHWAYS

Lanes	Median	B	C	D	E
2	Undivided	730	1,460	2,080	2,620
4	Divided	3,220	4,660	6,040	6,840
6	Divided	4,840	6,990	9,060	10,280

Uninterrupted Flow Highway Adjustments

Lanes	Median	Exclusive left lanes	Adjustment factors
2	Divided	Yes	+5%
Multi	Undivided	Yes	-5%
Multi	Undivided	No	-25%

BICYCLE MODE[2]

(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Paved Shoulder/ Bicycle Lane Coverage	B	C	D	E
0-49%	**	310	1,180	>1,180
50-84%	240	360	>360	***
85-100%	620	>620	***	***

PEDESTRIAN MODE[2]

(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Sidewalk Coverage	B	C	D	E
0-49%	**	**	480	1,390
50-84%	**	**	1,100	1,820
85-100%	**	1,100	1,820	>1,820

BUS MODE (Scheduled Fixed Route)[3]

(Buses in peak hour in peak direction)

Sidewalk Coverage	B	C	D	E
0-84%	>5	≥4	≥3	≥2
85-100%	>4	≥3	≥2	≥1

[1] Values shown are presented as hourly two-way volumes for levels of service and are for the automobile/truck modes unless specifically stated Although presented as peak hour two-way volumes, they actually represent peak hour peak direction conditions with an applicable D factor applied This table does not constitute a standard and should be used only for general planning applications The computer models from which this table is derived should be used for more specific planning applications The table and deriving computer models should not be used for corridor or intersection design, where more refined techniques exist Calculations are based on planning applications of the Highway Capacity Manual, Bicycle LOS Model, Pedestrian LOS Model and Transit Capacity and Quality of Service Manual, respectively for the automobile/truck, bicycle, pedestrian and bus modes

[2] Level of service for the bicycle and pedestrian modes in this table is based on number of motorized vehicles, not number of bicyclists or pedestrians using the facility

[3] Buses per hour shown are only for the peak hour in the single direction of the higher traffic flow

** Cannot be achieved using table input value defaults

*** Not applicable for that level of service letter grade For the automobile mode, volumes greater than level of service D become F because intersection capacities have been reached For the bicycle mode, the level of service letter grade (including F) is not achievable because there is no maximum vehicle volume threshold using table input value defaults

Source:
Florida Department of Transportation
Systems Planning Office
605 Suwannee Street, MS 19
Tallahassee, FL 32399-0450

TABLE 5

Generalized **Peak Hour Two-Way** Volumes for Florida's **Areas Transitioning into Urbanized Areas** OR **Areas Over 5,000 Not In Urbanized Areas**[1]

10/4/10

STATE SIGNALIZED ARTERIALS

Class I (>0.00 to 1.99 signalized intersections per mile)

Lanes	Median	B	C	D	E
2	Undivided	860	1,370	1,480	***
4	Divided	2,600	3,110	3,280	***
6	Divided	4,020	4,710	4,950	***

Class II (2.00 to 4.50 signalized intersections per mile)

Lanes	Median	B	C	D	E
2	Undivided	**	910	1,330	1,420
4	Divided	**	2,200	2,910	3,080
6	Divided	**	3,460	4,400	4,640

Class III/IV (more than 4.50 signalized intersections per mile)

Lanes	Median	B	C	D	E
2	Undivided	**	460	1,040	1,300
4	Divided	**	1,110	2,480	2,800
6	Divided	**	1,750	3,860	4,260

Non-State Signalized Roadway Adjustments

(Alter corresponding volume by the indicated percent.)

Major City/County Roadways - 10%
Other Signalized Roadways - 35%

State & Non-State Signalized Roadway Adjustments

(Alter corresponding volume by the indicated percent.)

Divided/Undivided & Turn Lane Adjustments

Lanes	Median	Exclusive Left Lanes	Exclusive Right Lanes	Adjustment Factors
2	Divided	Yes	No	+5%
2	Undivided	No	No	-20%
Multi	Undivided	Yes	No	-5%
Multi	Undivided	No	No	-25%
–	–	–	Yes	+ 5%

One-Way Facility Adjustment

Multiply the corresponding two-directional volumes in this table by 0.6.

FREEWAYS

Lanes	B	C	D	E
4	4,000	5,410	6,460	6,920
6	6,000	8,140	9,710	10,690
8	8,000	10,870	12,930	14,450
10	10,000	13,690	16,200	18,120

Freeway Adjustments

Auxiliary Lanes	Ramp Metering
+ 1,800	+ 5%

UNINTERRUPTED FLOW HIGHWAYS

Lanes	Median	B	C	D	E
2	Undivided	770	1,460	2,040	2,590
4	Divided	3,040	4,400	5,700	6,460
6	Divided	4,570	6,600	8,550	9,700

Uninterrupted Flow Highway Adjustments

Lanes	Median	Exclusive left lanes	Adjustment factors
2	Divided	Yes	+5%
Multi	Undivided	Yes	-5%
Multi	Undivided	No	-25%

BICYCLE MODE[2]

(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Paved Shoulder/ Bicycle Lane Coverage	B	C	D	E
0-49%	**	270	710	>710
50-84%	220	330	1,270	>1,270
85-100%	400	>400	***	***

PEDESTRIAN MODE[2]

(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Sidewalk Coverage	B	C	D	E
0-49%	**	**	480	1,390
50-84%	**	**	1,100	1,820
85-100%	**	1,100	1,820	>1,820

[1] Values shown are presented as hourly two-way volumes for levels of service and are for the automobile/truck modes unless specifically stated Although presented as peak hour two-way volumes, they actually represent peak hour direction conditions with an applicable D factor applied This table does not constitute a standard and should be used only for general planning applications The computer models from which this table is derived should be used for more specific planning applications The table and deriving computer models should not be used for corridor or intersection design, where more refined techniques exist Calculations are based on planning applications of the Highway Capacity Manual, Bicycle LOS Model, Pedestrian LOS Model and Transit Capacity and Quality of Service Manual, respectively for the automobile/truck, bicycle, pedestrian and bus modes

[2] Level of service for the bicycle and pedestrian modes in this table is based on number of motorized vehicles, not number of bicyclists or pedestrians using the facility

[3] Buses per hour shown are only for the peak hour in the single direction of the higher traffic flow

** Cannot be achieved using table input value defaults

*** Not applicable for that level of service letter grade For the automobile mode, volumes greater than level of service D become F because intersection capacities have been reached For the bicycle mode, the level of service letter grade (including F) is not achievable because there is no maximum vehicle volume threshold using table input value defaults

Source:
Florida Department of Transportation
Systems Planning Office
605 Suwannee Street, MS 19
Tallahassee, FL 32399-0450

APPENDIX C

AT-GRADE RAILROAD CROSSING DATA

U.S. DOT - CROSSING INVENTORY INFORMATION
AS OF 8/13/2012

Crossing No.: 750694A   Update Reason: Changed Crossing   Effective Begin-Date of Record: 09/12/11

Railroad: SJVR San Joaquin Valley RR Co. [SJVR]   End-Date of Record:

Initiating Agency Railroad   Type and Positiion: Public At Grade

Part I Location and Classification of Crossing

Division:	SAN JOAQUIN	State:	CA
Subdivision:	BAKERSFIELD	County:	FRESNO
Branch or Line Name:	BR-CLOVIS	City:	Near FRESNO
Railroad Milepost:	0006.26	Street or Road Name:	OLIVE AVE
RailRoad I.D. No.:	BS-212.7	Highway Type & No.:	
Nearest RR Timetable Stn:	LAS PALMAS	HSR Corridor ID:	
Parent Railroad:		County Map Ref. No.:	9C5
Crossing Owner:		Latitude:	36.7314000
ENS Sign Installed:		Longitude:	-120.0050130
Passenger Service:		Lat/Long Source:	
Avg Passenger Train Count:	0	Quiet Zone:	No
Adjacent Crossing with Separate Number:			

Private Crossing Information:

Category: Public Access: Unknown

Specify Signs: Specify Signals:

	ST/RR A	ST/RR B	ST/RR C	ST/RR D
Railroad Use:				
State Use:				

Narrative:

Emergency Contact: (800)800-3490   Railroad Contact: (800)800-3490   State Contact: (213)576-7078

Part II Railroad Information

Number of Daily Train Movements: Less Than One Movement Per Day: No

Total Trains: 4   Total Switching: 4   Day Thru: 0

Typical Speed Range Over Crossing: From 10 to 20 mph   Maximum Time Table Speed: 20

Type and Number of Tracks: Main: 0   Other 1   Specify: SPUR

Does Another RR Operate a Separate Track at Crossing? No

Does Another RR Operate Over Your Track at Crossing? No

U.S. DOT - CROSSING INVENTORY INFORMATION
Continued

Crossing 750694A

Effective Begin-Date of Record: 09/12/11
End-Date of Record:

Part III: Traffic Control Device Information

Signs:

Crossbucks:	0	Highway Stop Signs:	0
Advanced Warning:	Yes	Hump Crossing Sign:	
Pavement Markings:	Stop Lines	Other Signs: 0 Specify:	
		0	

Train Activated Devices:

Gates:	0	4 Quad or Full Barrier:	
Mast Mounted FL:	2	Total Number FL Pairs:	0
Cantilevered FL (Over):	2	Cantilevered FL (Not over):	0
Other Flashing Lights:	0	Specify Other Flashing Lights:	
Highway Traffic Signals:	0	Wigwags: 0 Bells:	2
Other Train Activated Warning Devices:		Special Warning Devices Not Train Activated:	
Channelization:		Type of Train Detection:	DC/AFO
Track Equipped with Train Signals?	No	Traffic Light Interconnection/Preemption:	

Part IV: Physical Characteristics

Type of Development:	Commercial	Smallest Crossing Angle:	60 to 90 Degrees
Number of Traffic Lanes Crossing Railroad:	4	Are Truck Pullout Lanes Present?	No
Is Highway Paved?	Yes		
Crossing Surface:	Timber	If Other:	
Nearby Intersecting Highway?	Less than 75 feet	Is it Signalized?	
Does Track Run Down a Street?	No	Is Crossing Illuminated?	
Is Commercial Power Available?	Yes		

Part V: Highway Information

Highway System:	Other FA Highway - Not NHS	Functional Classification of Road at Crossing:	Urban Collector
Is Crossing on State Highway System:	No		
Annual Average Daily Traffic (AADT):	001200	AADT Year:	1987
Estimated Percent Trucks:	15	Avg. No of School Buses per Day:	0
Posted Highway Speed:	0		

Annual WBAPS 2012

WEB ACCIDENT PREDICTION SYSTEM

Accident Prediction Report for
Public at-Grade Highway-Rail Crossings

Including:

Disclaimer/Abbreviation Key
Accident Prediction List
Collision History
Abbreviated Inventory Profile

Provided by:

Federal Railroad Administration
Office of Safety Analysis
Highway-Rail Crossing Safety & Trespass Prevention

Data Contained in this Report:

Crossing: 750694a'

Date Prepared: 8/13/2012

U.S. Department
of Transportation
Federal Railroad
Administration

USING DATA PRODUCED BY WBAPS
(Web Accident Prediction System)

1200 New Jersey Avenue, SE
Third Floor West
Washington, DC 20590

WBAPS generates reports listing public highway-rail intersections for a State, County, City or railroad ranked by predicted collisions per year. These reports include brief lists of the Inventory record and the collisions over the last 10 years along with a list of contacts for further information. These data were produced by the Federal Railroad Administration's Web Accident Prediction System (WBAPS).

WBAPS is a computer model which provides the user an analytical tool, which combined with other site-specific information, can assist in determining where scarce highway-rail grade crossing resources can best be directed. This computer model does not rank crossings in terms of most to least dangerous. Use of WBAPS data in this manner is incorrect and misleading.

WBAPS provides the same reports as PCAPS, which is FRA's PC Accident Prediction System. PCAPS was originally developed as a tool to alert law enforcement and local officials of the important need to improve safety at public highway-rail intersections within their jurisdictions. It has since become an indispensable information resource which is helping the FRA, States, railroads, Operation Lifesaver and others, to raise the awareness of the potential dangers at public highway-rail intersections. The PCAPS/WBAPS output enables State and local highway and law enforcement agencies identify public highway-rail crossing locations which may require additional or specialized attention. It is also a tool which can be used by state highway authorities and railroads to nominate particular crossings which may require physical safety improvements or enhancements.

The WBAPS accident prediction formula is based upon two independent factors (variables) which includes (1) basic data about a crossing's physical and operating characteristics and (2) five years of accident history data at the crossing. These data are obtained from the FRA's inventory and accident/incident files which are subject to keypunch and submission errors. Although every attempt is made to find and correct errors, there is still a possibility that some errors still exist. Erroneous, inaccurate and non-current data will alter WBAPS accident prediction values. While approximately 100,000 inventory file changes and updates are voluntarily provided annually by States and railroads and processed by FRA into the National Inventory File, data records for specific crossings may not be completely current. Only the intended users (States and railroads) are really knowledgeable as to how current the inventory data is for a particular State, railroad, or location.

It is important to understand the type of information produced by WBAPS and the limitations on the application of the output data. WBAPS does not state that specific crossings are the most dangerous. Rather, the WBAPS data provides an indication that conditions are such that one crossing may possibly be more hazardous than another based on the specific data that is in the program. It is only one of many tools which can be used to assist individual States, railroads and local highway authorities in determining where and how to initially focus attention for improving safety at public highway-rail intersections. WBAPS is designed to nominate crossings for further evaluation based only upon the physical and operating characteristics of specific crossings as voluntarily reported and updated by States and railroads and five years of accident history data.

PCAPS and WBAPS software are not designed to single out specific crossings without considering the many other factors which may influence accident rates or probabilities. State highway planners may or may not use PCAPS/WBAPS accident prediction model. Some States utilize their own formula or model which may include other geographic and site-specific factors. At best, PCAPS and WBAPS software and data nominates crossings for further on-the-ground review by knowledgeable highway traffic engineers and specialists. The output information is not the end or final product and the WBAPS data should not be used for non-intended purposes.

It should also be noted that there are certain characteristics or factors which are not, nor can be, included in the WBAPS database. These include sight-distance, highway congestion, bus or hazardous material traffic, local topography, and passenger exposure (train or vehicle), etc. Be aware that PCAPS/WBAPS is only one model and that other accident prediction models which may be used by States may yield different, by just as valid, results for ranking crossings for safety improvements.

Finally, it should be noted that this database is not the sole indicator of the condition of a specific public highway-rail intersection. The WBAPS output must be considered as a supplement to the information needed to undertake specific actions aimed at enhancing highway-rail crossing safety at locations across the U.S. The authority and jurisdiction to appropriate resources towards the safety improvement or elimination of specific crossings lies with the individual States.

U.S. Department
of Transportation
Federal Railroad
Administration

ABBREVIATION KEY

for use with WBAPS Reports

1200 New Jersey Avenue, SE
Third Floor West
Washington, DC 20590

The lists produced are only for public at-grade highway-rail intersections for the entity listed at the top of the page. The parameters shown are those used in the collision prediction calculation.

RANK:	Crossings are listed in order and ranked with the highest collision prediction value first.
PRED COLLS:	The accident prediction value is the probability that a collision between a train and a highway vehicle will occur at the crossing in a year.
CROSSING:	The unique sight specific identifying DOT/AAR Crossing Inventory Number.
RR:	The alphabetic abbreviation for the railroad name.
CITY:	The city in (or near) which the crossing is located.
ROAD:	The name of the road, street, or highway (if provided) where the crossing is located.
NUM OF COLLISIONS:	The number of accidents reported to FRA in each of the years indicated. Note: Most recent year is partial year (data is not for the complete calendar year) unless Accidents per Year is 'AS OF DECEMBER 31'.
DATE CHG:	The date of the latest change of the warning device category at the crossing which impacts the collision prediction calculation, e.g., a change from crossbucks to flashing lights, or flashing lights to gates. The accident prediction calculation utilizes three different formulas, on each for (1) passive devices, (2) flashing lights only, and (3) flashing lights with gates. When a date is shown, the collision history prior to the indicated year-month is not included in calculating the accident prediction value.
WD:	The type of warning device shown on the current Inventory record for the crossing where: FQ=Four Quad Gates; GT = All Other Gates; FL = Flashing lights; HS = Wigwags, Highway Signals, Bells, or Other Activated; SP = Special Protection (e.g., a flagman); SS = Stop Signs; XB = Crossbucks; OS = Other Signs or Signals; NO = No Signs or Signals.
TOT TRNS:	Number of total trains per day.
TOT TRKS:	Total number of railroad tracks between the warning devices at the crossing.
TTBL SPD:	The maximum timetable (allowable) speed for trains through the crossing.
HWY PVD:	Is the highway paved on both sides of the crossing?
HWY LNS:	The number of highway traffic lanes crossing the tracks at the crossing.
AADT:	The Average Annual Daily Traffic count for highway vehicles using the crossing.

*PUBLIC HIGHWAY-RAIL CROSSINGS RANKED BY PREDICTED ACCIDENTS PER YEAR AS OF 12/31/2011**

*Num of Collisions: Most recent year is partial year (data is not for the complete calendar year) unless Accidents per Year is 'AS OF DECEMBER 31'.

RANK	PRED COLLS	CROSSING	RR	STATE	COUNTY	CITY	ROAD	NUM OF COLLISIONS 11*	10	09	08	07	DATE CHG	WD	TOT TRN	TOT TRK	TTBL SPD	HWY PVD	HWY LNS	AADT
1	0 007425	750694A	SJVR	CA	FRESNO	FRESNO	OLIVE AVE	0	0	0	0	0		FL	4	1	20	YES	4	1,200
TTL:	0 007425							0	0	0	0	0								

TEN YEAR COLLISION HISTORY AT PUBLIC AT-GRADE CROSSINGS ON THE ACCIDENT PREDICTION LIST

Crossing	Date/Time	Railroad	City/hwy	Highway User/ User Speed	Type Track/ Train Speed	Weather	Circumstances/ View of Track Obstructed	Warning Devices/ Operating?	Interc/ Lights	# Killed / # Injured
Total Accidents:	0									

Total accidents this report: 0

ABBREVIATED HIGHWAY-RAIL CROSSING INVENTORY PROFILE

Crossing	State	County	City	Highway	Railroad
750694A	CA	FRESNO	FRESNO		SJVR

Division	Subdivision	Milepost	Train Movements
SAN JOAQUIN	BAKERSFIELD	0006.26	4 Day switch

Typical Train Speed	Type Development	# Traffic Lanes	Highway Paved?
From 10 to 20 MPH	3	4	1 / 1

Passive Devices	Active Devices

Tracks	Highway System	Function Class	AADT	% Trucks
1 SPUR	03	17	1200	15

APPENDIX D

TRAFFIC COUNT DATA SHEETS

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA11_8086_001 **Day:** WEDNESDAY

City: City of Fresno **Date:** 12/14/2011

AM

NS/EW Streets:	Fowler Ave			Fowler Ave			Floradora Ave			Floradora Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:													
7:00 AM		78	0	0	95					0		0	173
7:15 AM		87	0	1	93					1		2	184
7:30 AM		78	0	0	86					0		1	165
7:45 AM		91	1	0	83					0		1	176
8:00 AM		76	0	0	81					0		0	157
8:15 AM		76	3	0	92					0		0	171
8:30 AM		78	0	0	83					2		0	163
8:45 AM		79	3	0	90					1		1	174
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	643	7	1	703	0	0	0	0	4	0	5	1363
APPROACH %'s :	0.00%	98.92%	1.08%	0.14%	99.86%	0.00%	#DIV/0!	#DIV/0!	#DIV/0!	44.44%	0.00%	55.56%	
PEAK HR START TIME :	700 AM												TOTAL
PEAK HR VOL :	0	334	1	1	357	0	0	0	0	1	0	4	698
PEAK HR FACTOR :		0.910			0.942			0.000			0.417		0.948

CONTROL :

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA11_8086_001 **Day:** WEDNESDAY

City: City of Fresno **Date:** 12/14/2011

PM

NS/EW Streets:	Fowler Ave			Fowler Ave			Floradora Ave			Floradora Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:													
4:00 PM		111	1	3	110					0		0	225
4:15 PM		143	0	3	105					1		0	252
4:30 PM		137	0	4	130					1		0	272
4:45 PM		127	1	0	95					0		0	223
5:00 PM		122	1	2	116					1		1	243
5:15 PM		146	1	0	121					0		1	269
5:30 PM		144	2	0	126					4		0	276
5:45 PM		128	1	0	119					1		0	249

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	1058	7	12	922	0	0	0	0	8	0	2	2009
APPROACH %'s :	0.00%	99.34%	0.66%	1.28%	98.72%	0.00%	#DIV/0!	#DIV/0!	#DIV/0!	80.00%	0.00%	20.00%	

PEAK HR START TIME :	500 PM												TOTAL
PEAK HR VOL :	0	540	5	2	482	0	0	0	0	6	0	2	1037
PEAK HR FACTOR :		0.927			0.960			0.000			0.500		0.939

CONTROL :

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA11_8086_002 **Day:** WEDNESDAY

City: City of Fresno **Date:** 12/14/2011

AM

NS/EW Streets:	Fowler Ave			Fowler Ave			Olive Ave			Olive Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:													
7:00 AM	7	77	13	0	92	6	1	6	0	62	22	1	287
7:15 AM	10	79	14	1	87	2	10	7	4	85	25	2	326
7:30 AM	4	68	8	0	81	2	4	10	5	112	46	4	344
7:45 AM	1	77	13	1	76	5	6	11	5	92	51	2	340
8:00 AM	2	66	20	1	68	7	6	17	1	87	29	5	309
8:15 AM	1	73	14	0	82	7	1	8	4	74	21	1	286
8:30 AM	8	67	9	4	75	12	2	5	2	42	19	5	250
8:45 AM	4	77	11	2	84	2	4	7	9	31	7	2	240

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	37	584	102	9	645	43	34	71	30	585	220	22	2382
APPROACH %'s :	5.12%	80.77%	14.11%	1.29%	92.54%	6.17%	25.19%	52.59%	22.22%	70.74%	26.60%	2.66%	

PEAK HR START TIME :	715 AM												TOTAL
PEAK HR VOL :	17	290	55	3	312	16	26	45	15	376	151	13	1319
PEAK HR FACTOR :		0.879			0.919			0.896			0.833		0.959

CONTROL :

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA11_8086_002 **Day:** WEDNESDAY

City: City of Fresno **Date:** 12/14/2011

PM

NS/EW Streets:	Fowler Ave			Fowler Ave			Olive Ave			Olive Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:													
4:00 PM	3	91	23	2	106	4	16	20	9	22	9	1	306
4:15 PM	6	124	25	0	103	4	15	24	4	16	12	1	334
4:30 PM	4	114	30	4	118	4	18	25	12	31	14	1	375
4:45 PM	2	105	25	2	94	4	17	30	4	19	13	2	317
5:00 PM	3	108	27	0	106	7	16	30	11	28	14	0	350
5:15 PM	4	111	17	3	107	14	24	35	15	24	12	4	370
5:30 PM	3	125	26	1	115	13	22	24	10	19	13	2	373
5:45 PM	0	111	23	1	100	17	13	16	7	24	20	1	333

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	25	889	196	13	849	67	141	204	72	183	107	12	2758
APPROACH %'s :	2.25%	80.09%	17.66%	1.40%	91.39%	7.21%	33.81%	48.92%	17.27%	60.60%	35.43%	3.97%	

PEAK HR START TIME :	500 PM												TOTAL
PEAK HR VOL :	10	455	93	5	428	51	75	105	43	95	59	7	1426
PEAK HR FACTOR :		0.906			0.938			0.753			0.894		0.956

CONTROL :

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA11_8086_003 **Day:** WEDNESDAY

City: City of Fresno **Date:** 12/14/2011

AM

NS/EW Streets:	Armstrong Ave			Armstrong Ave			Floradora Ave			Floradora Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:													
7:00 AM	0	9	0	1	61	0	0	1	0	1	1	0	74
7:15 AM	0	15	0	1	81	1	0	1	1	3	4	2	109
7:30 AM	0	14	0	1	128	0	0	0	1	4	2	0	150
7:45 AM	3	36	1	0	92	0	1	1	1	4	2	1	142
8:00 AM	0	35	1	0	62	0	1	0	1	5	1	1	107
8:15 AM	1	13	1	0	50	0	0	1	0	0	0	0	66
8:30 AM	0	9	0	0	31	0	0	0	0	0	0	1	41
8:45 AM	0	10	0	0	23	1	0	1	0	0	2	0	37

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	4	141	3	3	528	2	2	5	4	17	12	5	726
APPROACH %'s :	2.70%	95.27%	2.03%	0.56%	99.06%	0.38%	18.18%	45.45%	36.36%	50.00%	35.29%	14.71%	

PEAK HR START TIME :	715 AM												TOTAL
PEAK HR VOL :	3	100	2	2	363	1	2	2	4	16	9	4	508
PEAK HR FACTOR :		0.656			0.709			0.667			0.806		0.847

CONTROL :

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA11_8086_003 **Day:** WEDNESDAY

City: City of Fresno **Date:** 12/14/2011

PM

NS/EW Streets:	Armstrong Ave			Armstrong Ave			Floradora Ave			Floradora Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:													
4:00 PM	0	36	1	2	18	0	1	1	1	2	0	0	62
4:15 PM	0	41	1	0	22	0	0	3	0	2	0	1	70
4:30 PM	0	43	3	0	28	0	0	3	1	1	1	3	83
4:45 PM	0	52	2	0	21	1	1	1	0	2	0	0	80
5:00 PM	0	48	2	3	27	0	1	0	1	0	0	0	82
5:15 PM	1	53	2	2	25	0	0	1	0	0	3	1	88
5:30 PM	0	45	0	0	24	0	0	1	0	1	0	1	72
5:45 PM	0	38	1	1	20	0	1	0	0	0	0	0	61

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	1	356	12	8	185	1	4	10	3	8	4	6	598
APPROACH %'s :	0.27%	96.48%	3.25%	4.12%	95.36%	0.52%	23.53%	58.82%	17.65%	44.44%	22.22%	33.33%	

PEAK HR START TIME :	430 PM												TOTAL
PEAK HR VOL :	1	196	9	5	101	1	2	5	2	3	4	4	333
PEAK HR FACTOR :		0.920			0.892			0.563			0.550		0.946

CONTROL :

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA11_8086_004 **Day:** WEDNESDAY

City: City of Fresno **Date:** 12/14/2011

AM

NS/EW Streets:	Armstrong Ave			Armstrong Ave			Olive Ave			Olive Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:													
7:00 AM	3	3	2	1	19	39	6	16	0	1	43	0	133
7:15 AM	6	11	2	1	29	55	5	14	0	1	51	0	175
7:30 AM	6	13	8	4	36	83	4	16	3	12	87	0	272
7:45 AM	13	26	14	5	33	58	8	23	2	13	67	4	266
8:00 AM	11	21	21	11	21	37	11	20	5	8	81	6	253
8:15 AM	9	5	6	2	12	38	5	16	0	9	45	3	150
8:30 AM	7	7	2	0	8	24	3	12	1	3	35	1	103
8:45 AM	3	2	0	1	7	15	9	9	2	1	19	0	68

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	58	88	55	25	165	349	51	126	13	48	428	14	1420
APPROACH %'s :	28.86%	43.78%	27.36%	4.64%	30.61%	64.75%	26.84%	66.32%	6.84%	9.80%	87.35%	2.86%	

PEAK HR START TIME :	715 AM												TOTAL
PEAK HR VOL :	36	71	45	21	119	233	28	73	10	34	286	10	966
PEAK HR FACTOR :		0.717			0.758			0.771			0.833		0.888

CONTROL :

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA11_8086_004 **Day:** WEDNESDAY

City: City of Fresno **Date:** 12/14/2011

PM

NS/EW Streets:	Armstrong Ave			Armstrong Ave			Olive Ave			Olive Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:													
4:00 PM	2	23	1	4	10	8	19	21	2	1	23	0	114
4:15 PM	1	22	5	2	7	12	15	24	4	0	21	2	115
4:30 PM	1	23	7	3	11	18	23	39	0	1	21	2	149
4:45 PM	2	26	9	0	9	10	20	34	0	0	22	1	133
5:00 PM	2	32	4	1	13	7	22	34	1	4	24	1	145
5:15 PM	0	28	1	2	11	12	23	32	0	2	21	3	135
5:30 PM	2	23	2	1	10	15	20	30	1	3	18	0	125
5:45 PM	9	24	12	2	10	10	13	25	5	7	20	0	137

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	19	201	41	15	81	92	155	239	13	18	170	9	1053
APPROACH %'s :	7.28%	77.01%	15.71%	7.98%	43.09%	48.94%	38.08%	58.72%	3.19%	9.14%	86.29%	4.57%	

PEAK HR START TIME :	430 PM												TOTAL
PEAK HR VOL :	5	109	21	6	44	47	88	139	1	7	88	7	562
PEAK HR FACTOR :		0.888			0.758			0.919			0.879		0.943

CONTROL :

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA11_8086_002 **Day:** WEDNESDAY

City: City of Fresno **Date:** 12/14/2011

AM

NS/EW Streets:	Fowler Ave			Fowler Ave			Olive Ave			Olive Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:													
7:00 AM	0	2	2		0			0	1		0		5
7:15 AM	0	0	0		1			0	0		1		2
7:30 AM	0	0	0		2			0	0		0		2
7:45 AM	0	4	1		0			1	1		1		8
8:00 AM	0	2	0		3			0	0		0		5
8:15 AM	0	2	0		1			0	0		0		3
8:30 AM	0	2	0		1			1	1		0		5
8:45 AM	1	1	0		1			0	0		0		3

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	1	13	3	0	9	0	0	2	3	0	2	0	33
APPROACH %'s :	5.88%	76.47%	17.65%	0.00%	100.00%	0.00%	0.00%	40.00%	60.00%	0.00%	100.00%	0.00%	

PEAK HR START TIME :	745 AM												TOTAL
PEAK HR VOL :	0	10	1	0	5	0	0	2	2	0	1	0	21
PEAK HR FACTOR :		0.550			0.417			0.500			0.250		0.656

CONTROL :

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA11_8086_002 **Day:** WEDNESDAY

City: City of Fresno **Date:** 12/14/2011

PM

NS/EW Streets:	Fowler Ave			Fowler Ave			Olive Ave			Olive Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:													
4:00 PM		0	0		1	0	0	0		0		0	1
4:15 PM		1	0		1	0	0	0		0		0	2
4:30 PM		0	0		0	0	0	1		1		0	2
4:45 PM		3	0		0	0	1	0		0		0	4
5:00 PM		1	0		3	1	0	1		0		0	6
5:15 PM		2	0		1	0	0	0		0		1	4
5:30 PM		0	0		2	1	0	0		0		0	3
5:45 PM		1	1		2	0	0	0		0		0	4

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	8	1	0	10	2	1	2	0	1	0	1	26
APPROACH %'s :	0.00%	88.89%	11.11%	0.00%	83.33%	16.67%	33.33%	66.67%	0.00%	50.00%	0.00%	50.00%	

PEAK HR START TIME :	500 PM												TOTAL
PEAK HR VOL :	0	4	1	0	8	2	0	1	0	0	0	1	17
PEAK HR FACTOR :		0.625			0.625			0.250			0.250		0.708

CONTROL :

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA11_8086_004 **Day:** WEDNESDAY

City: City of Fresno **Date:** 12/14/2011

AM

NS/EW Streets:	Armstrong Ave			Armstrong Ave			Olive Ave			Olive Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:													
7:00 AM													
7:15 AM					0			2			1		3
7:30 AM					0			1			0		1
7:45 AM					0			1			1		2
8:00 AM					0			1			0		1
8:15 AM					1			0			0		1
8:30 AM													
8:45 AM													

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	0	0	0	1	0	0	5	0	0	2	0	8
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	0.00%	100.00%	0.00%	0.00%	100.00%	0.00%	0.00%	100.00%	0.00%	

PEAK HR START TIME :	715 AM												TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	5	0	0	2	0	7
PEAK HR FACTOR :	0.000			0.000			0.625			0.500			0.583

CONTROL :

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA11_8086_004 **Day:** WEDNESDAY

City: City of Fresno **Date:** 12/14/2011

PM

NS/EW Streets:	Armstrong Ave			Armstrong Ave			Olive Ave			Olive Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:													
4:00 PM													
4:15 PM													
4:30 PM	0							1			1		2
4:45 PM													
5:00 PM	1							1			0		2
5:15 PM													
5:30 PM													
5:45 PM													

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	1	0	0	0	0	0	0	2	0	0	1	0	4
APPROACH %'s :	100.00%	0.00%	0.00%	#DIV/0!	#DIV/0!	#DIV/0!	0.00%	100.00%	0.00%	0.00%	100.00%	0.00%	

PEAK HR START TIME :	430 PM												TOTAL
PEAK HR VOL :	1	0	0	0	0	0	0	2	0	0	1	0	4
PEAK HR FACTOR :	0.250			0.000			0.500			0.250			0.500

CONTROL :

PREPARED BY NATIONAL DATA & SURVEYING SERVICES

Pedestrian Count

	Start:	End:
AM	7:00	9:00
NOON		
PM	16:00	18:00

PROJECT#: 11-8086-004
N/S Street: Armstrong Ave
E/W Street: Olive Ave
DATE: 12/14/2011 DAY: Wednesday
CITY: Fresno

NORTH LEG

AM	0
NOON	0
PM	0

0	**AM**
0	**NOON**
0	**PM**

WEST LEG

AM	NOON	PM
0	0	0

0	0	0
AM	**NOON**	**PM**

EAST LEG

AM	NOON	PM
1	0	0

0	0	0
AM	**NOON**	**PM**

SOUTH LEG

AM	0
NOON	0
PM	0

0	**AM**
0	**NOON**
0	**PM**

PREPARED BY NATIONAL DATA & SURVEYING SERVICES

Bicycle Count

	Start:	End:
AM	7:00	9:00
NOON		
PM	16:00	18:00

PROJECT#: 11-8086-004
N/S Street: Armstrong Ave
E/W Street: Olive Ave
DATE: 12/14/2011 DAY: Wednesday
CITY: Fresno

NORTH LEG

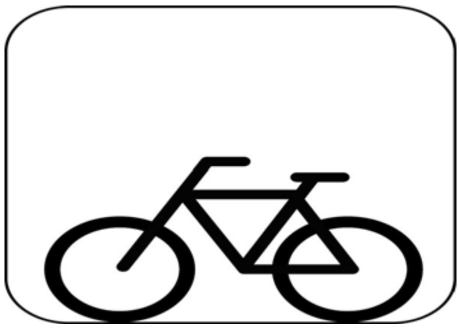
AM	0
NOON	0
PM	0

0	AM
0	NOON
0	PM

AM	NOON	PM
0	0	0

AM	NOON	PM
0	0	0

WEST LEG



EAST LEG

0	0	0
AM	NOON	PM

0	0	0
AM	NOON	PM

SOUTH LEG

AM	0
NOON	0
PM	0

0	AM
0	NOON
0	PM

Prepared by NDS/ATD

VOLUME

Fowler Ave between Floradora Ave & Olive Ave

Day: Wednesday
Date: 12/14/2011

City: Fresno
Project #: CA11_8087_001

DAILY TOTALS	NB	SB	EB	WB	Total
	6,365	5,896	0	0	12,261

AM Period	NB		SB		EB	WB	TOTAL	
00:00	19		17				36	
00:15	13		8				21	
00:30	17		11				28	
00:45	10	59	7	43			17	102
01:00	7		11				18	
01:15	8		4				12	
01:30	6		5				11	
01:45	4	25	9	29			13	54
02:00	2		6				8	
02:15	2		4				6	
02:30	5		5				10	
02:45	8	17	7	22			15	39
03:00	5		11				16	
03:15	5		5				10	
03:30	6		5				11	
03:45	14	30	8	29			22	59
04:00	5		14				19	
04:15	10		11				21	
04:30	25		30				55	
04:45	54	94	11	66			65	160
05:00	14		21				35	
05:15	24		25				49	
05:30	44		36				80	
05:45	81	163	55	137			136	300
06:00	36		50				86	
06:15	73		64				137	
06:30	74		82				156	
06:45	89	272	84	280			173	552
07:00	76		92				168	
07:15	88		110				198	
07:30	90		94				184	
07:45	105	359	86	382			191	741
08:00	89		102				191	
08:15	71		83				154	
08:30	71		87				158	
08:45	79	310	63	335			142	645
09:00	63		76				139	
09:15	68		58				126	
09:30	77		61				138	
09:45	86	294	60	255			146	549
10:00	77		74				151	
10:15	83		72				155	
10:30	68		54				122	
10:45	83	311	62	262			145	573
11:00	93		66				159	
11:15	93		69				162	
11:30	84		77				161	
11:45	89	359	80	292			169	651
TOTALS		2293		2132				**4425**
SPLIT %		51.8%		48.2%				**36.1%**

PM Period	NB		SB		EB	WB	TOTAL	
12:00	75		91				166	
12:15	99		79				178	
12:30	95		90				185	
12:45	102	371	101	361			203	732
13:00	120		95				215	
13:15	111		121				232	
13:30	96		132				228	
13:45	108	435	107	455			215	890
14:00	88		100				188	
14:15	98		105				203	
14:30	104		113				217	
14:45	120	410	105	423			225	833
15:00	114		101				215	
15:15	115		102				217	
15:30	117		121				238	
15:45	112	458	100	424			212	882
16:00	105		102				207	
16:15	145		97				242	
16:30	141		118				259	
16:45	132	523	93	410			225	933
17:00	134		114				248	
17:15	151		113				264	
17:30	145		128				273	
17:45	125	555	155	510			280	1065
18:00	102		90				192	
18:15	105		89				194	
18:30	107		85				192	
18:45	97	411	78	342			175	753
19:00	95		53				148	
19:15	74		67				141	
19:30	83		55				138	
19:45	77	329	50	225			127	554
20:00	62		68				130	
20:15	73		54				127	
20:30	42		55				97	
20:45	57	234	58	235			115	469
21:00	45		55				100	
21:15	43		46				89	
21:30	38		42				80	
21:45	33	159	32	175			65	334
22:00	34		47				81	
22:15	35		32				67	
22:30	22		26				48	
22:45	23	114	20	125			43	239
23:00	21		36				57	
23:15	17		15				32	
23:30	18		17				35	
23:45	17	73	11	79			28	152
TOTALS		4072		3764				**7836**
SPLIT %		52.0%		48.0%				**63.9%**

DAILY TOTALS	NB	SB	EB	WB	Total
	6,365	5,896	0	0	12,261

	NB	SB	EB	WB	Total		NB	SB	EB	WB	Total
AM Peak Hour	07:15	07:15			**07:15**	**PM Peak Hour**	16:45	17:00			**17:00**
AM Pk Volume	372	392			**764**	**PM Pk Volume**	562	510			**1065**
Pk Hr Factor	0.886	0.891			**0.965**	**Pk Hr Factor**	0.930	0.823			**0.951**
7 - 9 Volume	669	717	0	0	**1386**	**4 - 6 Volume**	1078	920	0	0	**1998**
7 - 9 Peak Hour	07:15	07:15			**07:15**	**4 - 6 Peak Hour**	16:45	17:00			**17:00**
7 - 9 Pk Volume	372	392	0	0	**764**	**4 - 6 Pk Volume**	562	510	0	0	**1065**
Pk Hr Factor	0.886	0.891	0.000	0.000	**0.965**	**Pk Hr Factor**	0.930	0.823	0.000	0.000	**0.951**

Prepared by NDS/ATD

VOLUME

Armstrong Ave between Floradora Ave & Olive Ave

Day: Wednesday
Date: 12/14/2011

City: Fresno
Project #: CA11_8087_002

DAILY TOTALS	NB	SB	EB	WB	Total
	1,290	1,789	0	0	3,079

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	1		2				3		12:00	12		20				32	
00:15	1		3				4		12:15	14		21				35	
00:30	1		1				2		12:30	10		20				30	
00:45	2	5	3	9			5	14	12:45	11	47	16	77			27	124
01:00	0		1				1		13:00	11		16				27	
01:15	0		2				2		13:15	14		19				33	
01:30	0		1				1		13:30	23		25				48	
01:45	0		0	4			0	4	13:45	44	92	40	100			84	192
02:00	0		0				0		14:00	28		22				50	
02:15	0		0				0		14:15	14		19				33	
02:30	3		0				3		14:30	20		20				40	
02:45	1	4	0				1	4	14:45	22	84	20	81			42	165
03:00	1		2				3		15:00	18		33				51	
03:15	2		0				2		15:15	17		22				39	
03:30	1		3				4		15:30	18		25				43	
03:45	1	5	2	7			3	12	15:45	26	79	30	110			56	189
04:00	1		3				4		16:00	43		25				68	
04:15	0		2				2		16:15	40		22				62	
04:30	1		5				6		16:30	48		33				81	
04:45	1	3	6	16			7	19	16:45	53	184	20	100			73	284
05:00	3		6				9		17:00	55		27				82	
05:15	1		13				14		17:15	53		24				77	
05:30	0		10				10		17:30	44		25				69	
05:45	4	8	12	41			16	49	17:45	39	191	25	101			64	292
06:00	5		15				20		18:00	22		23				45	
06:15	10		27				37		18:15	33		22				55	
06:30	9		39				48		18:30	18		15				33	
06:45	10	34	58	139			68	173	18:45	13	86	10	70			23	156
07:00	9		63				72		19:00	12		17				29	
07:15	16		86				102		19:15	10		12				22	
07:30	17		133				150		19:30	13		17				30	
07:45	40	82	99	381			139	463	19:45	11	46	6	52			17	98
08:00	38		67				105		20:00	8		9				17	
08:15	15		52				67		20:15	9		10				19	
08:30	11		33				44		20:30	9		6				15	
08:45	12	76	26	178			38	254	20:45	7	33	3	28			10	61
09:00	9		25				34		21:00	6		3				9	
09:15	14		24				38		21:15	9		8				17	
09:30	17		24				41		21:30	13		4				17	
09:45	11	51	20	93			31	144	21:45	12	40	2	17			14	57
10:00	13		15				28		22:00	2		4				6	
10:15	12		20				32		22:15	8		2				10	
10:30	10		20				30		22:30	7		7				14	
10:45	20	55	15	70			35	125	22:45	5	22	3	16			8	38
11:00	11		40				51		23:00	3		0				3	
11:15	9		14				23		23:15	1		2				3	
11:30	17		18				35		23:30	4		3				7	
11:45	17	54	21	93			38	147	23:45	1	9	1	6			2	15
TOTALS		377		1031				**1408**	**TOTALS**		913		758				**1671**
SPLIT %		26.8%		73.2%				**45.7%**	**SPLIT %**		54.6%		45.4%				**54.3%**

DAILY TOTALS	NB	SB	EB	WB	Total
	1,290	1,789	0	0	3,079

	NB	SB	EB	WB	TOTAL		NB	SB	EB	WB	TOTAL
AM Peak Hour	07:15	07:15			**07:15**	**PM Peak Hour**	16:30	15:00			**16:30**
AM Pk Volume	111	385			**496**	**PM Pk Volume**	209	110			**313**
Pk Hr Factor	0.694	0.724			**0.827**	**Pk Hr Factor**	0.950	0.833			**0.954**
7 - 9 Volume	158	559	0	0	**717**	**4 - 6 Volume**	375	201	0	0	**576**
7 - 9 Peak Hour	07:15	07:15			**07:15**	**4 - 6 Peak Hour**	16:30	16:30			**16:30**
7 - 9 Pk Volume	111	385	0	0	**496**	**4 - 6 Pk Volume**	209	104	0	0	**313**
Pk Hr Factor	0.694	0.724	0.000	0.000	**0.827**	**Pk Hr Factor**	0.950	0.788	0.000	0.000	**0.954**

Prepared by NDS/ATD

VOLUME

Floradora Ave between Fowler Ave & Armstrong Ave

Day: Wednesday **City:** Fresno
Date: 12/14/2011 **Project #:** CA11_8087_003

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	65	95	160

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			0		0		0		12:00			1		1		2	
00:15			0		0		0		12:15			3		4		7	
00:30			0		0		0		12:30			1		1		2	
00:45			0		0		0		12:45			0	5	0	6	0	11
01:00			0		0		0		13:00			0		2		2	
01:15			0		0		0		13:15			0		2		2	
01:30			0		0		0		13:30			1		2		3	
01:45			0		0		0		13:45			3	4	1	7	4	11
02:00			0		0		0		14:00			1		3		4	
02:15			0		0		0		14:15			0		0		0	
02:30			0		0		0		14:30			0		0		0	
02:45			0		0		0		14:45			3	4	4	7	7	11
03:00			0		0		0		15:00			0		0		0	
03:15			0		0		0		15:15			1		1		2	
03:30			0		0		0		15:30			1		1		2	
03:45			0		0		0		15:45			2	4	2	4	4	8
04:00			0		0		0		16:00			4		1		5	
04:15			0		0		0		16:15			2		1		3	
04:30			0		0		0		16:30			4		1		5	
04:45			0		0		0		16:45			2	12	1	4	3	16
05:00			0		0		0		17:00			2		0		2	
05:15			0		0		0		17:15			1		4		5	
05:30			0		0		0		17:30			1		1		2	
05:45			0		0		0		17:45			1	5	0	5	1	10
06:00			0		0		0		18:00			0		0		0	
06:15			0		0		0		18:15			1		2		3	
06:30			0		0		0		18:30			0		0		0	
06:45			1	1	4	4	5	5	18:45			0	1	1	3	1	4
07:00			1		1		2		19:00			0		0		0	
07:15			4		6		10		19:15			1		0		1	
07:30			1		1		2		19:30			1		1		2	
07:45			3	9	6	14	9	23	19:45			0	2	1	2	1	4
08:00			1		1		2		20:00			0		0		0	
08:15			1		2		3		20:15			1		0		1	
08:30			0		0		0		20:30			0		0		0	
08:45			1	3	3	6	4	9	20:45			0	1	1	1	1	2
09:00			1		2		3		21:00			0		0		0	
09:15			1		1		2		21:15			0		0		0	
09:30			2		3		5		21:30			1		2		3	
09:45			0	4	0	6	0	10	21:45			1	2	1	3	2	5
10:00			1		3		4		22:00			0		0		0	
10:15			2		5		7		22:15			1		0		1	
10:30			0		0		0		22:30			0		0		0	
10:45			0	3	5	13	5	16	22:45			0	1	0		0	1
11:00			1		0		1		23:00			0		1		1	
11:15			0		1		1		23:15			0		0		0	
11:30			1		4		5		23:30			0		0		0	
11:45			2	4	3	8	5	12	23:45			0		1	2	1	2
TOTALS				24		51		**75**	**TOTALS**				41		44		**85**
SPLIT %				32.0%		68.0%		**46.9%**	**SPLIT %**				48.2%		51.8%		**53.1%**

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	65	95	160

	NB	SB	EB	WB	Total		NB	SB	EB	WB	Total
AM Peak Hour			07 00	07 00	**07:00**	**PM Peak Hour**			15:45	13:15	**15:45**
AM Pk Volume			9	14	**23**	**PM Pk Volume**			12	8	**17**
Pk Hr Factor			0.563	0.583	**0.575**	**Pk Hr Factor**			0.750	0.667	**0.850**
7 - 9 Volume	0	0	12	20	**32**	**4 - 6 Volume**	0	0	17	9	**26**
7 - 9 Peak Hour			07 00	07 00	**07:00**	**4 - 6 Peak Hour**			16:00	16:30	**16:00**
7 - 9 Pk Volume	0	0	9	14	**23**	**4 - 6 Pk Volume**	0	0	12	6	**16**
Pk Hr Factor	0.000	0.000	0.563	0.583	**0.575**	**Pk Hr Factor**	0.000	0.000	0.750	0.375	**0.800**

Daily Speed Report

Prepared by: National Data & Surveying Services

City of Fresno

Project #: 11-8087-004e

Date: 12/14/11 WEDNESDAY

Location: Olive Ave btwn Fowler Ave & Armstrong Ave

East Bound

	5	15	20	25	30	35	40	45	50	55	60	65	70	
Time	**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00 AM	0	0	0	0	1	1	5	6	4	1	0	0	0	18
01:00	0	0	0	0	0	0	3	1	3	0	1	0	0	8
02:00	0	0	0	0	0	0	1	0	3	1	1	0	0	6
03:00	0	0	0	0	0	0	2	0	2	0	0	0	0	4
04:00	0	0	0	0	0	0	1	2	1	0	1	0	0	5
05:00	0	0	0	0	0	3	3	5	1	0	1	0	0	13
06:00	0	0	0	1	1	10	19	29	11	3	2	0	0	76
07:00	0	0	0	0	1	8	30	47	21	4	1	0	0	112
08:00	0	0	0	0	1	13	32	46	18	7	0	0	0	117
09:00	0	0	0	0	2	15	31	35	20	8	1	0	0	112
10:00	0	0	0	0	1	7	13	32	20	3	1	0	0	77
11:00	0	0	0	0	0	9	18	42	14	7	1	1	0	92
12:00 PM	0	0	0	0	0	2	34	35	26	9	1	0	0	107
13:00	0	0	0	1	4	13	24	33	25	8	2	0	0	110
14:00	0	0	0	1	2	13	32	58	34	13	2	0	0	155
15:00	0	0	0	2	5	16	50	60	31	4	3	0	0	171
16:00	0	0	0	0	6	20	35	77	63	14	5	0	0	220
17:00	0	0	0	0	3	14	63	80	41	7	1	0	0	209
18:00	0	0	0	0	1	11	23	56	21	9	1	0	0	122
19:00	0	0	0	0	0	7	29	33	21	3	1	0	0	94
20:00	0	0	0	2	2	6	23	31	14	10	1	0	0	89
21:00	0	0	0	0	0	5	17	20	14	5	2	1	0	64
22:00	0	0	0	0	3	4	12	15	11	2	0	0	0	47
23:00	0	0	0	0	2	0	7	17	7	1	0	0	0	34
Totals				**7**	**35**	**177**	**507**	**760**	**426**	**119**	**29**	**2**		**2062**
% of Totals				0%	2%	9%	25%	37%	21%	6%	1%	0%		100%
% AM				0%	0%	3%	8%	12%	6%	2%	0%	0%		31%
AM Peak Hour				06:00	09:00	09:00	08:00	07:00	07:00	09:00	06:00	11:00		08:00
Volume				1	2	15	32	47	21	8	2	1		117
% PM				0%	1%	5%	17%	25%	15%	4%	1%	0%		69%
PM Peak Hour				15:00	16:00	16:00	17:00	17:00	16:00	16:00	16:00	21:00		16:00
Volume				2	6	20	63	80	63	14	5	1		220

Average Speed	50th Percentile	85th Percentile
46.9	47	53

Daily Speed Report

Prepared by: National Data & Surveying Services

City of Fresno

Project #: 11-8087-004w

Date: 12/14/11 WEDNESDAY

Location: Olive Ave btwn Fowler Ave & Armstrong Ave

West Bound

Time	5 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 74+	Total
00:00 AM	0	0	0	0	0	2	4	1	0	0	0	0	0	7
01:00	0	0	0	1	0	4	2	0	0	0	0	0	0	7
02:00	0	0	0	0	0	0	2	1	1	0	0	0	0	4
03:00	0	0	0	0	1	3	0	2	0	0	0	0	0	6
04:00	0	0	0	0	1	6	4	8	0	0	0	0	0	19
05:00	0	0	0	0	1	23	38	17	0	0	0	0	0	79
06:00	0	0	0	1	10	78	117	25	3	0	0	0	0	234
07:00	0	0	1	3	23	119	248	101	4	0	0	0	0	499
08:00	0	0	0	1	13	86	136	60	3	0	0	0	0	299
09:00	0	0	1	2	25	56	69	29	3	1	0	0	0	186
10:00	0	0	1	7	27	65	38	19	1	0	0	0	0	158
11:00	0	0	1	2	9	44	54	17	2	0	0	0	0	129
12:00 PM	0	0	0	4	16	44	54	23	3	0	0	0	0	144
13:00	0	0	2	2	19	49	54	19	0	0	0	0	0	145
14:00	0	0	1	2	16	40	56	15	4	0	0	0	0	134
15:00	0	0	0	1	28	112	84	15	1	0	0	0	0	241
16:00	0	0	1	1	19	61	62	22	1	0	0	0	0	167
17:00	0	0	0	6	24	60	54	16	0	0	0	0	0	160
18:00	0	0	1	4	4	26	41	22	2	0	0	0	0	100
19:00	0	0	0	0	5	26	23	9	2	0	0	0	0	65
20:00	0	0	0	2	2	14	13	8	3	0	0	0	0	42
21:00	0	0	0	2	4	9	22	0	0	0	0	0	0	37
22:00	0	0	1	0	2	7	12	6	0	0	0	0	0	28
23:00	0	0	0	0	3	7	5	2	0	0	0	0	0	17
Totals			**10**	**41**	**252**	**941**	**1192**	**437**	**33**	**1**				**2907**
% of Totals			0%	1%	9%	32%	41%	15%	1%	0%				100%
% AM			0%	1%	4%	17%	24%	10%	1%	0%				56%
AM Peak Hour			07:00	10:00	10:00	07:00	07:00	07:00	07:00	09:00				07:00
Volume			1	7	27	119	248	101	4	1				499
% PM			0%	1%	5%	16%	17%	5%	1%					44%
PM Peak Hour			13:00	17:00	15:00	15:00	15:00	12:00	14:00					15:00
Volume			2	6	28	112	84	23	4					241

Average Speed	50th Percentile	85th Percentile
40.6	41	45

APPENDIX E

BASELINE INTERSECTION ANALYSIS SHEETS

Existing Conditions

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	1	4	334	1	1	357
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.91	0.91	0.94	0.94
Hourly flow rate (vph)	1	5	367	1	1	380
Pedestrians	10		10			10
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	1		1			1
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	769	388			378	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	769	388			378	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	99			100	
cM capacity (veh/h)	363	650			1171	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	6	368	381
Volume Left	1	0	1
Volume Right	5	1	0
cSH	561	1700	1171
Volume to Capacity	0.01	0.22	0.00
Queue Length 95th (ft)	1	0	0
Control Delay (s)	11.5	0.0	0.0
Lane LOS	B		A
Approach Delay (s)	11.5	0.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	32.4%	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 (veh/h)	2	2	4	16	9	4	3	100	2	2	363	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.66	0.66	0.66	0.71	0.71	0.71
Hourly flow rate (vph)	2	2	5	18	10	5	5	152	3	3	511	1
Pedestrians		10			10			10			10	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	709	701	532	705	700	173	523			165		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	709	701	532	705	700	173	523			165		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	99	99	95	97	99	100			100		
cM capacity (veh/h)	328	354	538	335	355	856	1035			1402		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	9	33	159	515
Volume Left	2	18	5	3
Volume Right	5	5	3	1
cSH	417	372	1035	1402
Volume to Capacity	0.02	0.09	0.00	0.00
Queue Length 95th (ft)	2	7	0	0
Control Delay (s)	13.8	15.6	0.3	0.1
Lane LOS	B	C	A	A
Approach Delay (s)	13.8	15.6	0.3	0.1
Approach LOS	B	C		

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	32.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	26	45	15	376	151	13	17	290	55	3	312	16
Peak Hour Factor	0.90	0.90	0.90	0.83	0.83	0.83	0.88	0.88	0.88	0.92	0.92	0.92
Hourly flow rate (vph)	29	50	17	453	182	16	19	330	62	3	339	17

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	29	67	453	198	411	360
Volume Left (vph)	29	0	453	0	19	3
Volume Right (vph)	0	17	0	16	63	17
Hadj (s)	0.53	-0.14	0.53	-0.02	-0.05	0.01
Departure Headway (s)	9.3	8.6	8.0	7.5	7.0	7.2
Degree Utilization, x	0.07	0.16	1.01	0.41	0.80	0.72
Capacity (veh/h)	354	380	434	477	505	486
Control Delay (s)	11.8	12.0	73.3	14.4	32.4	26.3
Approach Delay (s)	12.0		55.4		32.4	26.3
Approach LOS	B		F		D	D

Intersection Summary			
Delay	39.5		
HCM Level of Service	E		
Intersection Capacity Utilization	64.2%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	28	73	10	34	286	10	36	71	45	21	119	233
Peak Hour Factor	0.77	0.77	0.77	0.83	0.83	0.83	0.72	0.72	0.72	0.76	0.76	0.76
Hourly flow rate (vph)	36	95	13	41	345	12	50	99	62	28	157	307

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	144	398	211	491
Volume Left (vph)	36	41	50	28
Volume Right (vph)	13	12	63	307
Hadj (s)	0.03	0.04	-0.10	-0.33
Departure Headway (s)	7.2	6.5	6.8	5.9
Degree Utilization, x	0.29	0.72	0.40	0.81
Capacity (veh/h)	431	514	469	491
Control Delay (s)	13.1	24.5	14.2	29.4
Approach Delay (s)	13.1	24.5	14.2	29.4
Approach LOS	B	C	B	D

Intersection Summary			
Delay	23.4		
HCM Level of Service	C		
Intersection Capacity Utilization	49.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	6	2	540	5	2	482
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.91	0.91	0.88	0.88
Hourly flow rate (vph)	7	2	593	5	2	548
Pedestrians	10		10			10
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	1		1			1
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1168	616			609	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1168	616			609	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	100			100	
cM capacity (veh/h)	209	481			957	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	9	599	550
Volume Left	7	0	2
Volume Right	2	5	0
cSH	243	1700	957
Volume to Capacity	0.04	0.35	0.00
Queue Length 95th (ft)	3	0	0
Control Delay (s)	20.4	0.0	0.1
Lane LOS	C		A
Approach Delay (s)	20.4	0.0	0.1
Approach LOS	C		

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	41.6%	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 (veh/h)	2	5	2	3	4	4	1	196	9	5	101	1
Sign Control		Stop			Stop			Free			Free	
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)	2	5	2	3	4	4	1	213	10	5	110	1
Pedestrians		10			10			10			10	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	368	366	130	366	362	238	121			233		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	368	366	130	366	362	238	121			233		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	99	100	99	99	99	100			100		
cM capacity (veh/h)	561	549	901	563	552	785	1448			1318		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	10	12	224	116
Volume Left	2	3	1	5
Volume Right	2	4	10	1
cSH	604	623	1448	1318
Volume to Capacity	0.02	0.02	0.00	0.00
Queue Length 95th (ft)	1	1	0	0
Control Delay (s)	11.1	10.9	0.0	0.4
Lane LOS	B	B	A	A
Approach Delay (s)	11.1	10.9	0.0	0.4
Approach LOS	B	B		

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	24.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	75	105	43	95	59	7	10	455	93	5	428	51
Peak Hour Factor	0.90	0.90	0.90	0.83	0.83	0.83	0.88	0.88	0.88	0.92	0.92	0.92
Hourly flow rate (vph)	83	117	48	114	71	8	11	517	106	5	465	55

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	83	164	114	80	634	526
Volume Left (vph)	83	0	114	0	11	5
Volume Right (vph)	0	48	0	8	106	55
Hadj (s)	0.55	-0.15	0.55	-0.02	-0.05	-0.01
Departure Headway (s)	9.0	8.3	9.1	8.6	6.8	6.8
Degree Utilization, x	0.21	0.38	0.29	0.19	1.20	0.99
Capacity (veh/h)	393	426	383	409	533	526
Control Delay (s)	13.1	15.0	14.6	12.3	132.1	63.4
Approach Delay (s)	14.3		13.7		132.1	63.4
Approach LOS	B		B		F	F

Intersection Summary			
Delay	77.0		
HCM Level of Service	F		
Intersection Capacity Utilization	61.2%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	88	139	1	7	88	7	5	109	21	6	44	47
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)	96	151	1	8	96	8	5	118	23	7	48	51

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	248	111	147	105
Volume Left (vph)	96	8	5	7
Volume Right (vph)	1	8	23	51
Hadj (s)	0.13	0.02	-0.03	-0.23
Departure Headway (s)	4.8	4.9	4.9	4.8
Degree Utilization, x	0.33	0.15	0.20	0.14
Capacity (veh/h)	707	683	679	685
Control Delay (s)	10.2	8.7	9.1	8.6
Approach Delay (s)	10.2	8.7	9.1	8.6
Approach LOS	B	A	A	A

Intersection Summary			
Delay	9.4		
HCM Level of Service	A		
Intersection Capacity Utilization	35.6%	ICU Level of Service	A
Analysis Period (min)	15		

Long-Term (Year 2035) No-Project Conditions

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	2	8	1025	2	2	1251
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	9	1114	2	2	1360
Pedestrians	10		10			10
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	1		1			1
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2499	1135			1126	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2499	1135			1126	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	93	96			100	
cM capacity (veh/h)	31	242			615	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	11	1116	1362
Volume Left	2	0	2
Volume Right	9	2	0
cSH	103	1700	615
Volume to Capacity	0.11	0.66	0.00
Queue Length 95th (ft)	9	0	0
Control Delay (s)	44.2	0.0	0.2
Lane LOS	E		A
Approach Delay (s)	44.2	0.0	0.2
Approach LOS	E		

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	80.3%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	4	4	8	32	18	8	6	710	4	4	1041	2
Sign Control		Stop			Stop			Free			Free	
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)	4	4	9	35	20	9	7	772	4	4	1132	2
Pedestrians		10			10			10			10	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1967	1950	1153	1959	1949	794	1144			786		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1967	1950	1153	1959	1949	794	1144			786		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	87	93	96	17	69	98	99			99		
cM capacity (veh/h)	33	62	236	42	62	382	606			826		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	17	63	783	1138
Volume Left	4	35	7	4
Volume Right	9	9	4	2
cSH	74	54	606	826
Volume to Capacity	0.24	1.17	0.01	0.01
Queue Length 95th (ft)	21	137	1	0
Control Delay (s)	68.5	301.6	0.3	0.2
Lane LOS	F	F	A	A
Approach Delay (s)	68.5	301.6	0.3	0.2
Approach LOS	F	F		

Intersection Summary			
Average Delay	10.3		
Intersection Capacity Utilization	72.6%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	97	185	27	479	474	35	62	895	187	24	1091	138
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)	105	201	29	521	515	38	67	973	203	26	1186	150

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	105	230	521	553	1243	1362
Volume Left (vph)	105	0	521	0	67	26
Volume Right (vph)	0	29	0	38	203	150
Hadj (s)	0.53	-0.06	0.53	-0.01	-0.05	-0.03
Departure Headway (s)	10.2	9.6	9.6	9.0	8.8	8.8
Degree Utilization, x	0.30	0.62	1.39	1.39	3.03	3.33
Capacity (veh/h)	349	366	381	408	424	413
Control Delay (s)	16.3	25.6	214.4	213.7	937.1	1070.6
Approach Delay (s)	22.7		214.0		937.1	1070.6
Approach LOS	C		F		F	F

Intersection Summary			
Delay	712.5		
HCM Level of Service	F		
Intersection Capacity Utilization	140.8%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	103	110	24	193	515	86	56	531	139	69	625	388
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	117	125	27	219	585	98	64	603	158	78	710	441

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	269	902	825	1230
Volume Left (vph)	117	219	64	78
Volume Right (vph)	27	98	158	441
Hadj (s)	0.06	0.02	-0.07	-0.17
Departure Headway (s)	9.6	8.9	8.8	8.7
Degree Utilization, x	0.72	2.22	2.01	2.96
Capacity (veh/h)	368	413	417	428
Control Delay (s)	33.8	577.0	483.9	908.0
Approach Delay (s)	33.8	577.0	483.9	908.0
Approach LOS	D	F	F	F

Intersection Summary			
Delay	634.0		
HCM Level of Service	F		
Intersection Capacity Utilization	129.9%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	12	4	1504	10	4	1238
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	4	1635	11	4	1346
Pedestrians	10		10			10
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	1		1			1
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	3015	1660			1656	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	3015	1660			1656	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	9	96			99	
cM capacity (veh/h)	14	118			386	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	17	1646	1350
Volume Left	13	0	4
Volume Right	4	11	0
cSH	18	1700	386
Volume to Capacity	0.95	0.97	0.01
Queue Length 95th (ft)	62	0	1
Control Delay (s)	479.1	0.0	0.8
Lane LOS	F		A
Approach Delay (s)	479.1	0.0	0.8
Approach LOS	F		

Intersection Summary			
Average Delay	3.1		
Intersection Capacity Utilization	92.6%	ICU Level of Service	F
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	4	10	4	6	8	8	2	993	18	10	807	2
Sign Control		Stop			Stop			Free			Free	
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)	4	11	4	7	9	9	2	1079	20	11	877	2
Pedestrians		10			10			10			10	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2027	2023	898	2023	2015	1109	889			1109		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2027	2023	898	2023	2015	1109	889			1109		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	88	81	99	81	85	97	100			98		
cM capacity (veh/h)	35	56	332	34	56	251	756			624		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	20	24	1101	890
Volume Left	4	7	2	11
Volume Right	4	9	20	2
cSH	59	63	756	624
Volume to Capacity	0.33	0.38	0.00	0.02
Queue Length 95th (ft)	30	35	0	1
Control Delay (s)	94.2	93.0	0.1	0.5
Lane LOS	F	F	A	A
Approach Delay (s)	94.2	93.0	0.1	0.5
Approach LOS	F	F		

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	67.4%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	351	524	104	327	299	47	24	1116	243	25	1042	183
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)	382	570	113	355	325	51	26	1213	264	27	1133	199

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	382	683	355	376	1503	1359
Volume Left (vph)	382	0	355	0	26	27
Volume Right (vph)	0	113	0	51	264	199
Hadj (s)	0.53	-0.08	0.53	-0.06	-0.07	-0.05
Departure Headway (s)	10.2	9.6	10.2	9.6	9.5	9.5
Degree Utilization, x	1.08	1.82	1.01	1.00	3.97	3.59
Capacity (veh/h)	360	380	355	376	383	382
Control Delay (s)	102.8	399.2	81.5	78.0	1359.6	1191.5
Approach Delay (s)	293.0		79.7		1359.6	1191.5
Approach LOS	F		F		F	F

Intersection Summary			
Delay	865.8		
HCM Level of Service	F		
Intersection Capacity Utilization	148.3%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	280	464	7	98	331	47	18	686	139	41	603	173
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)	304	504	8	107	360	51	20	746	151	45	655	188

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	816	517	916	888
Volume Left (vph)	304	107	20	45
Volume Right (vph)	8	51	151	188
Hadj (s)	0.10	0.02	-0.06	-0.08
Departure Headway (s)	9.7	9.6	9.5	9.5
Degree Utilization, x	2.19	1.38	2.42	2.34
Capacity (veh/h)	379	385	387	388
Control Delay (s)	566.3	212.0	666.9	631.1
Approach Delay (s)	566.3	212.0	666.9	631.1
Approach LOS	F	F	F	F

Intersection Summary			
Delay	555.6		
HCM Level of Service	F		
Intersection Capacity Utilization	140.0%	ICU Level of Service	H
Analysis Period (min)	15		

Long-Term (Year 2035) No-Project Conditions

(With McKinley Avenue Realignment)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	44	50	221	243	289	116	252	736	129	29	826	98
Sign Control		Stop			Stop			Free			Free	
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)	48	54	240	264	314	126	274	800	140	32	898	107
Pedestrians					10			10			10	
Lane Width (ft)					12.0			12.0			12.0	
Walking Speed (ft/s)					4.0			4.0			4.0	
Percent Blockage					1			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2655	2512	961	2666	2495	890	1004			950		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2655	2512	961	2666	2495	890	1004			950		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	0	22	0	0	62	60			96		
cM capacity (veh/h)	0	16	308	0	17	336	690			717		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	48	295	264	440	274	940	32	1004
Volume Left	48	0	264	0	274	0	32	0
Volume Right	0	240	0	126	0	140	0	107
cSH	0	71	0	23	690	1700	717	1700
Volume to Capacity	Err	4.14	Err	19.34	0.40	0.55	0.04	0.59
Queue Length 95th (ft)	Err	Err	Err	Err	48	0	3	0
Control Delay (s)	Err	Err	Err	Err	13.6	0.0	10.3	0.0
Lane LOS	F	F	F	F	B		B	
Approach Delay (s)	Err		Err		3.1		0.3	
Approach LOS	F		F					

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	106.4%	ICU Level of Service	G
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	22	132	31	153	366	109	128	555	36	41	898	145
Sign Control		Stop			Stop			Free			Free	
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)	24	143	34	166	398	118	139	603	39	45	976	158
Pedestrians		10			10			10			10	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2382	2085	1075	2171	2144	643	1144			652		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2382	2085	1075	2171	2144	643	1144			652		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	0	87	0	0	75	77			95		
cM capacity (veh/h)	0	38	262	0	35	466	606			926		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	201	683	782	1178
Volume Left	24	166	139	45
Volume Right	34	118	39	158
cSH	0	0	606	926
Volume to Capacity	Err	Err	0.23	0.05
Queue Length 95th (ft)	Err	Err	22	4
Control Delay (s)	Err	Err	6.1	1.6
Lane LOS	F	F	A	A
Approach Delay (s)	Err	Err	6.1	1.6
Approach LOS	F	F		

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	143.5%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	97	185	27	479	474	35	62	895	187	24	1091	138
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)	105	201	29	521	515	38	67	973	203	26	1186	150

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	105	230	521	553	1243	1362
Volume Left (vph)	105	0	521	0	67	26
Volume Right (vph)	0	29	0	38	203	150
Hadj (s)	0.53	-0.06	0.53	-0.01	-0.05	-0.03
Departure Headway (s)	10.2	9.6	9.6	9.0	8.8	8.8
Degree Utilization, x	0.30	0.62	1.39	1.39	3.03	3.33
Capacity (veh/h)	349	366	381	408	424	413
Control Delay (s)	16.3	25.6	214.4	213.7	937.1	1070.6
Approach Delay (s)	22.7		214.0		937.1	1070.6
Approach LOS	C		F		F	F

Intersection Summary			
Delay	712.5		
HCM Level of Service	F		
Intersection Capacity Utilization	140.8%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	103	110	24	193	515	86	56	531	139	69	625	388
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	117	125	27	219	585	98	64	603	158	78	710	441

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	269	902	825	1230
Volume Left (vph)	117	219	64	78
Volume Right (vph)	27	98	158	441
Hadj (s)	0.06	0.02	-0.07	-0.17
Departure Headway (s)	9.6	8.9	8.8	8.7
Degree Utilization, x	0.72	2.22	2.01	2.96
Capacity (veh/h)	368	413	417	428
Control Delay (s)	33.8	577.0	483.9	908.0
Approach Delay (s)	33.8	577.0	483.9	908.0
Approach LOS	D	F	F	F

Intersection Summary			
Delay	634.0		
HCM Level of Service	F		
Intersection Capacity Utilization	129.9%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	104	254	241	193	129	57	326	906	282	104	801	81
Sign Control		Stop			Stop			Free			Free	
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)	113	276	262	210	140	62	354	985	307	113	871	88
Pedestrians					10			10			10	
Lane Width (ft)					12.0			12.0			12.0	
Walking Speed (ft/s)					4.0			4.0			4.0	
Percent Blockage					1			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2976	3151	925	3363	3042	1158	959			1301		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2976	3151	925	3363	3042	1158	959			1301		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	0	19	0	0	74	51			79		
cM capacity (veh/h)	0	4	324	0	5	235	717			528		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	113	538	210	202	354	1291	113	959
Volume Left	113	0	210	0	354	0	113	0
Volume Right	0	262	0	62	0	307	0	88
cSH	0	8	0	7	717	1700	528	1700
Volume to Capacity	Err	65.65	Err	28.14	0.49	0.76	0.21	0.56
Queue Length 95th (ft)	Err	Err	Err	Err	69	0	20	0
Control Delay (s)	Err	Err	Err	Err	14.8	0.0	13.7	0.0
Lane LOS	F	F	F	F	B		B	
Approach Delay (s)	Err		Err		3.2		1.4	
Approach LOS	F		F					

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	123.0%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	87	481	98	100	241	81	71	818	124	130	643	41
Sign Control		Stop			Stop			Free			Free	
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)	95	523	107	109	262	88	77	889	135	141	699	45
Pedestrians		10			10			10			10	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2354	2202	741	2503	2157	977	753			1034		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2354	2202	741	2503	2157	977	753			1034		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	0	74	0	0	71	91			79		
cM capacity (veh/h)	0	31	409	0	34	299	849			667		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	724	459	1101	885
Volume Left	95	109	77	141
Volume Right	107	88	135	45
cSH	0	0	849	667
Volume to Capacity	Err	Err	0.09	0.21
Queue Length 95th (ft)	Err	Err	7	20
Control Delay (s)	Err	Err	2.7	5.6
Lane LOS	F	F	A	A
Approach Delay (s)	Err	Err	2.7	5.6
Approach LOS	F	F		

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	124.7%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	351	524	104	327	299	47	24	1116	243	25	1042	183
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)	382	570	113	355	325	51	26	1213	264	27	1133	199

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	382	683	355	376	1503	1359
Volume Left (vph)	382	0	355	0	26	27
Volume Right (vph)	0	113	0	51	264	199
Hadj (s)	0.53	-0.08	0.53	-0.06	-0.07	-0.05
Departure Headway (s)	10.2	9.6	10.2	9.6	9.5	9.5
Degree Utilization, x	1.08	1.82	1.01	1.00	3.97	3.59
Capacity (veh/h)	360	380	355	376	383	382
Control Delay (s)	102.8	399.2	81.5	78.0	1359.6	1191.5
Approach Delay (s)	293.0		79.7		1359.6	1191.5
Approach LOS	F		F		F	F

Intersection Summary			
Delay	865.8		
HCM Level of Service	F		
Intersection Capacity Utilization	148.3%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	280	464	7	98	331	47	18	686	139	41	603	173
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)	304	504	8	107	360	51	20	746	151	45	655	188

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	816	517	916	888
Volume Left (vph)	304	107	20	45
Volume Right (vph)	8	51	151	188
Hadj (s)	0.10	0.02	-0.06	-0.08
Departure Headway (s)	9.7	9.6	9.5	9.5
Degree Utilization, x	2.19	1.38	2.42	2.34
Capacity (veh/h)	379	385	387	388
Control Delay (s)	566.3	212.0	666.9	631.1
Approach Delay (s)	566.3	212.0	666.9	631.1
Approach LOS	F	F	F	F

Intersection Summary			
Delay	555.6		
HCM Level of Service	F		
Intersection Capacity Utilization	140.0%	ICU Level of Service	H
Analysis Period (min)	15		

APPENDIX F

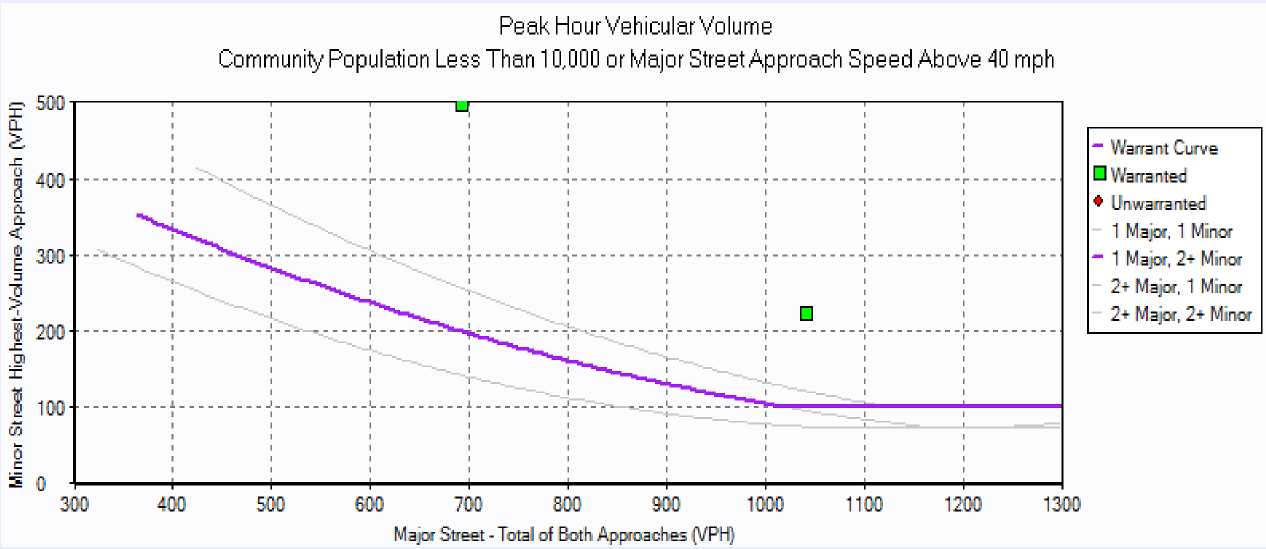
BASELINE PEAK-HOUR TRAFFIC SIGNAL WARRANTS

Warrant 3: Peak Hour

Existing

3: Fowler Ave & Olive Ave

Warrant 3

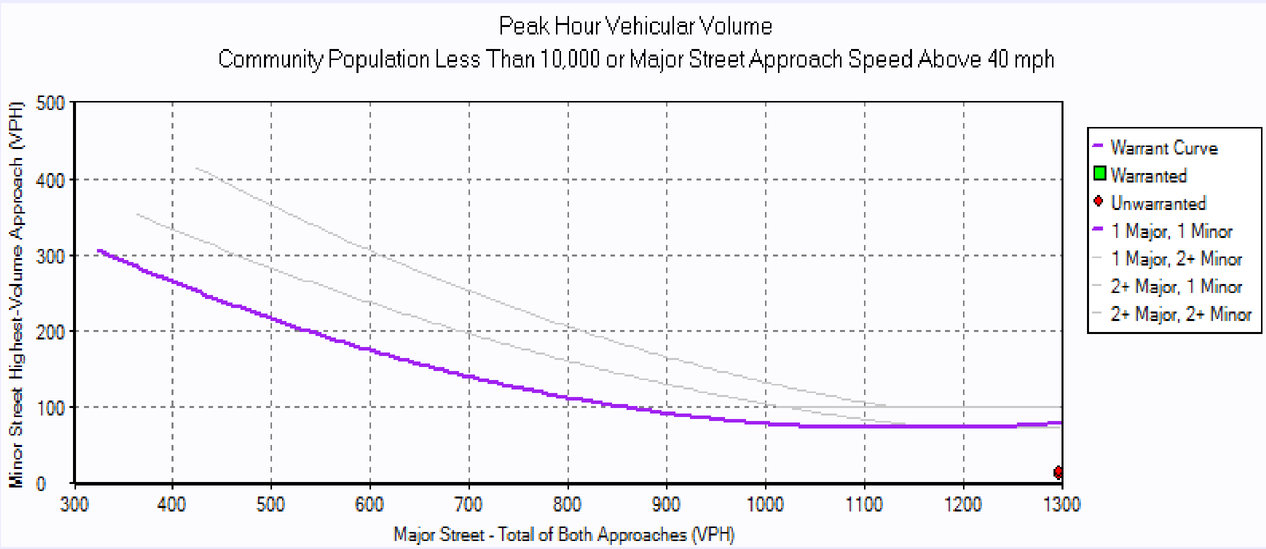


Note: Please turn over for volume information.

Warrant 3: Peak Hour

1: Fowler Ave & Floradora Ave

Warrant 3



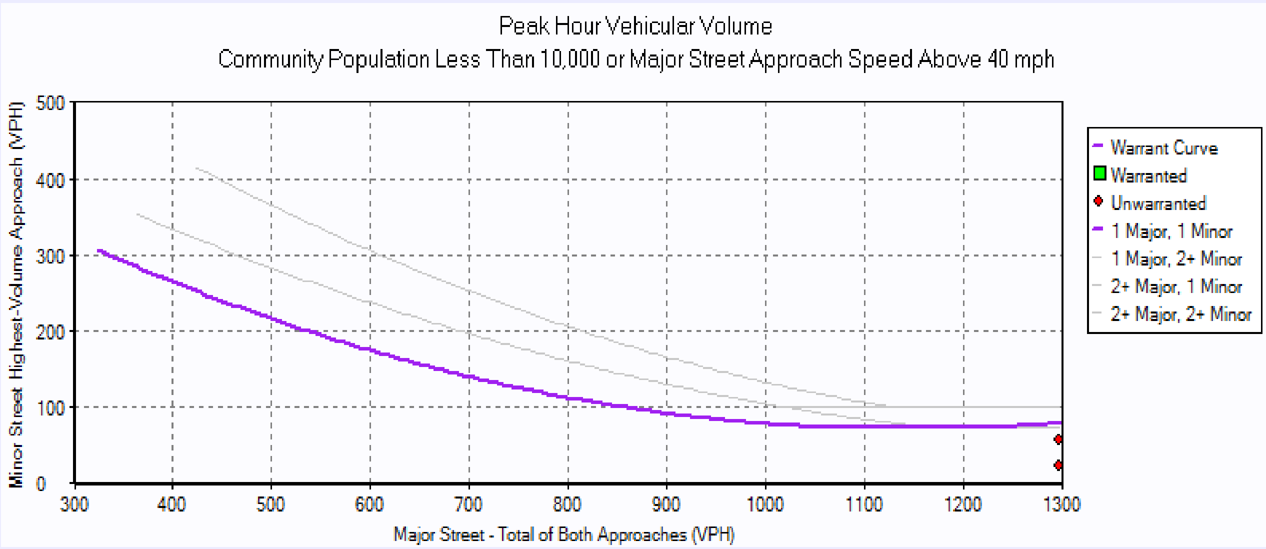
Note: Please turn over for volume information.

Warrant 3: Peak Hour

2035 No Project

2: Armstrong Ave & Floradora Ave

Warrant 3



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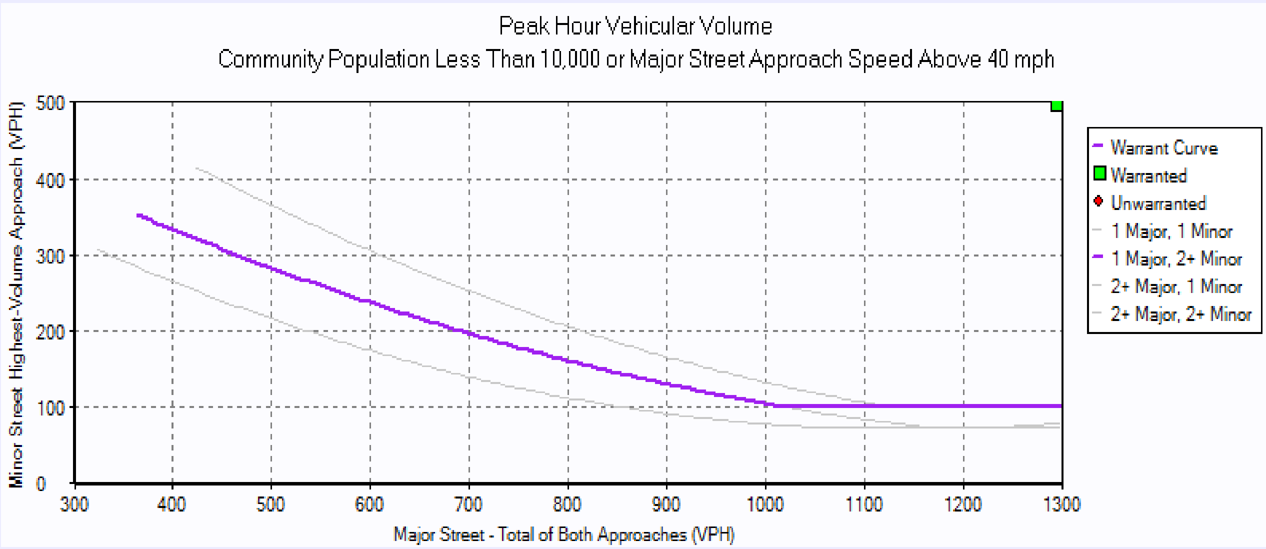
Warrant 3: Peak Hour

2035 No Project

3: Fowler Ave & Olive Ave

Warrant 3



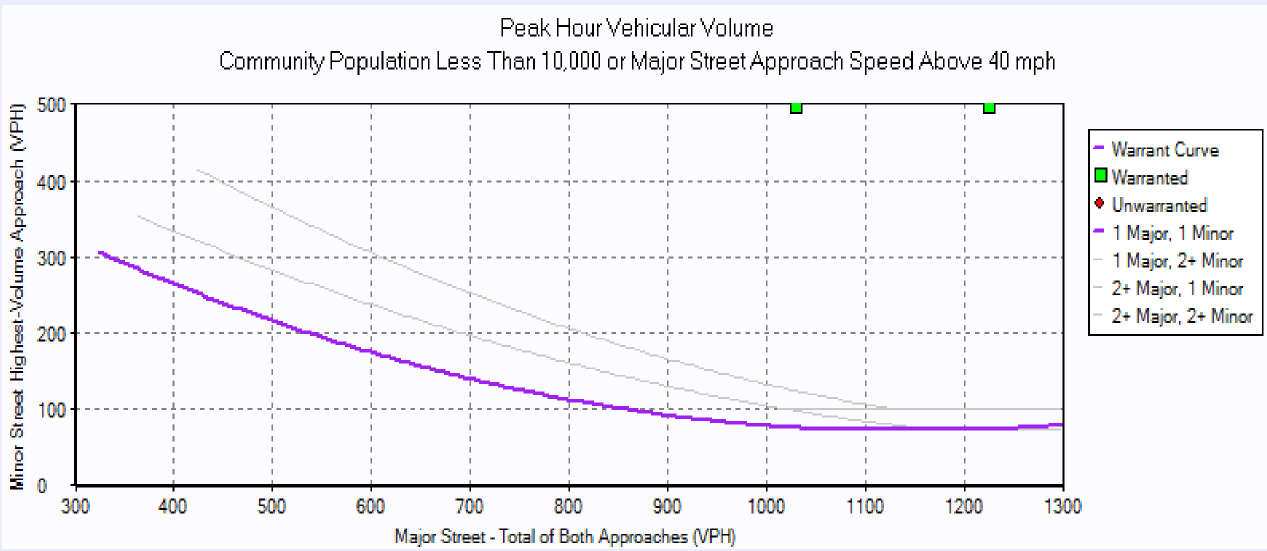
Note: Please turn over for volume information.

Warrant 3: Peak Hour

2035 No Project

4: Armstrong Ave & Olive Ave

Warrant 3

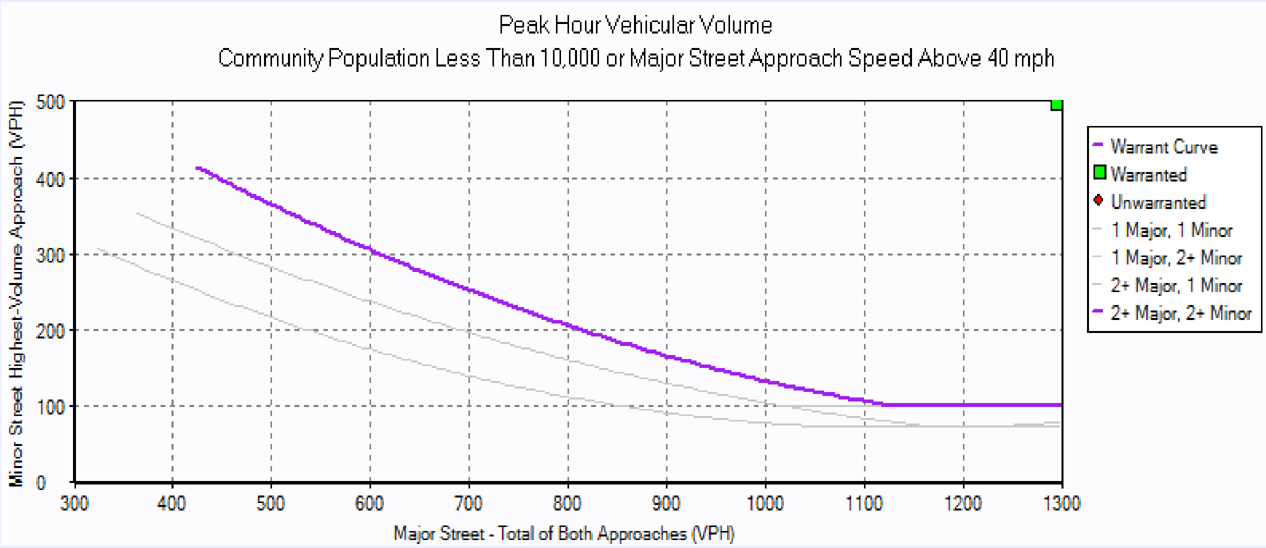


Note: Please turn over for volume information.

Warrant 3: Peak Hour

1: Fowler Ave & Floradora / McKinley

Warrant 3



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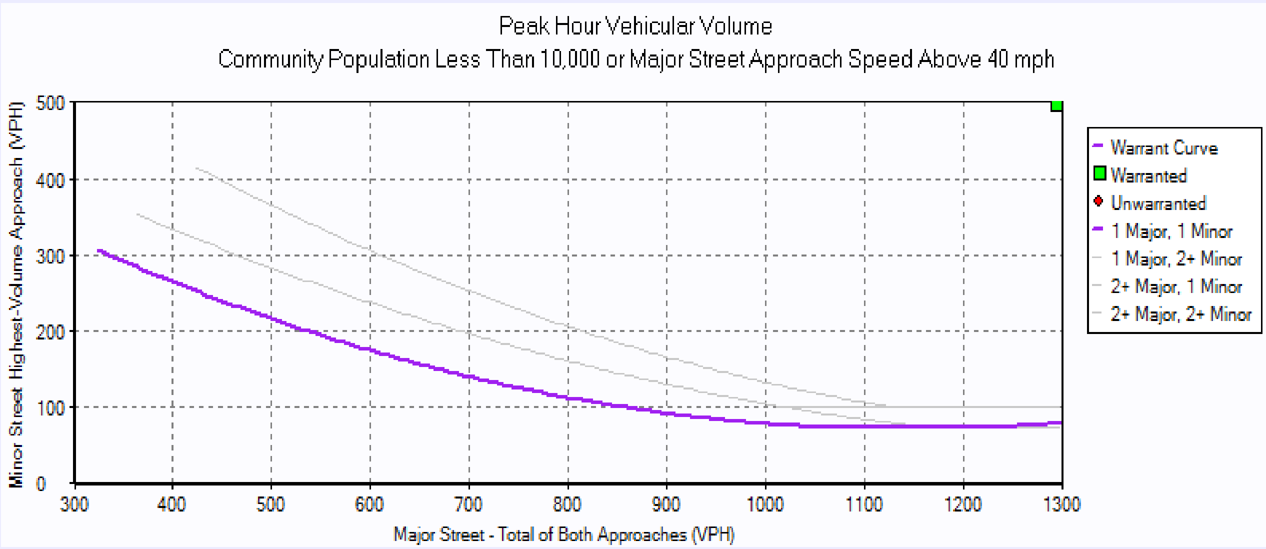
Warrant 3: Peak Hour

2: Armstrong Ave & Floradora / McKinley

Warrant 3



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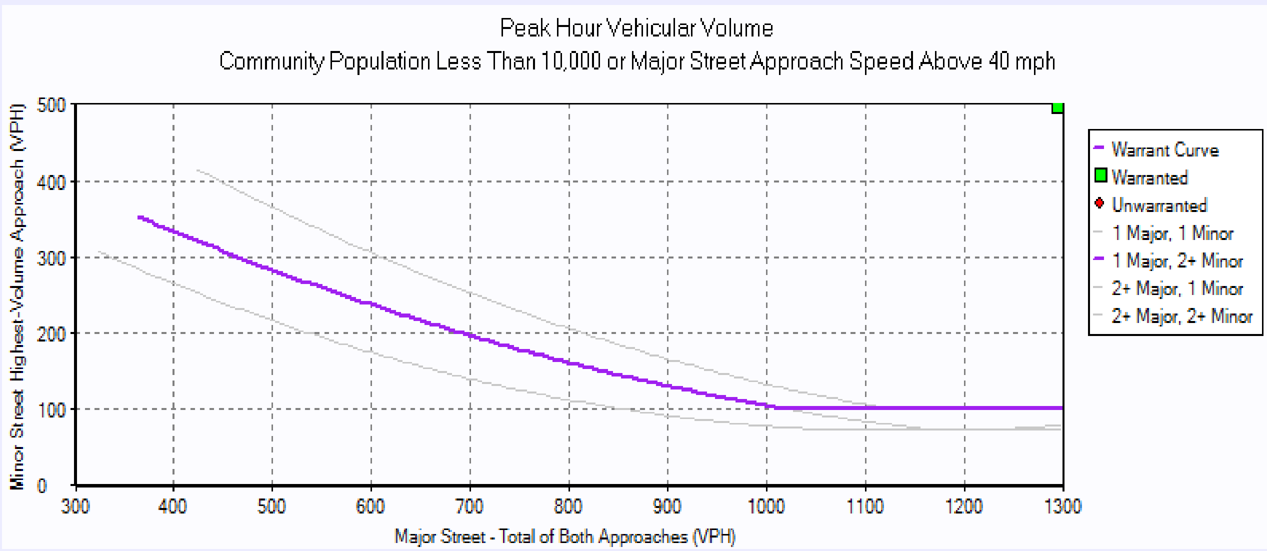
Warrant 3: Peak Hour

3: Fowler Ave & Olive Ave

Warrant 3

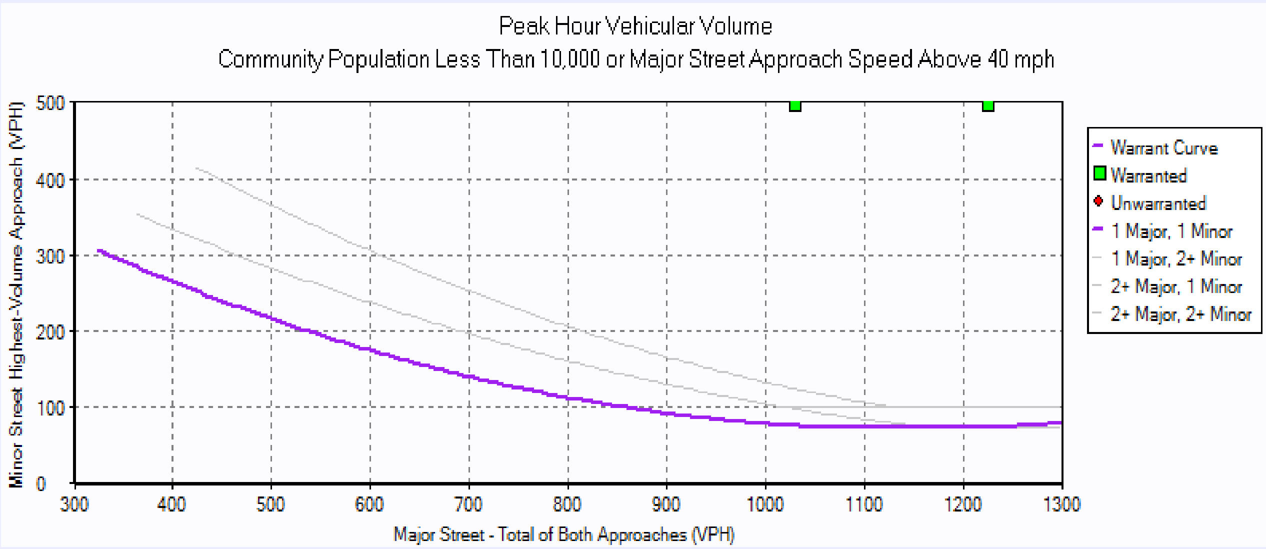


Note: Please turn over for volume information.

Warrant 3: Peak Hour

4: Armstrong Ave & Olive Ave

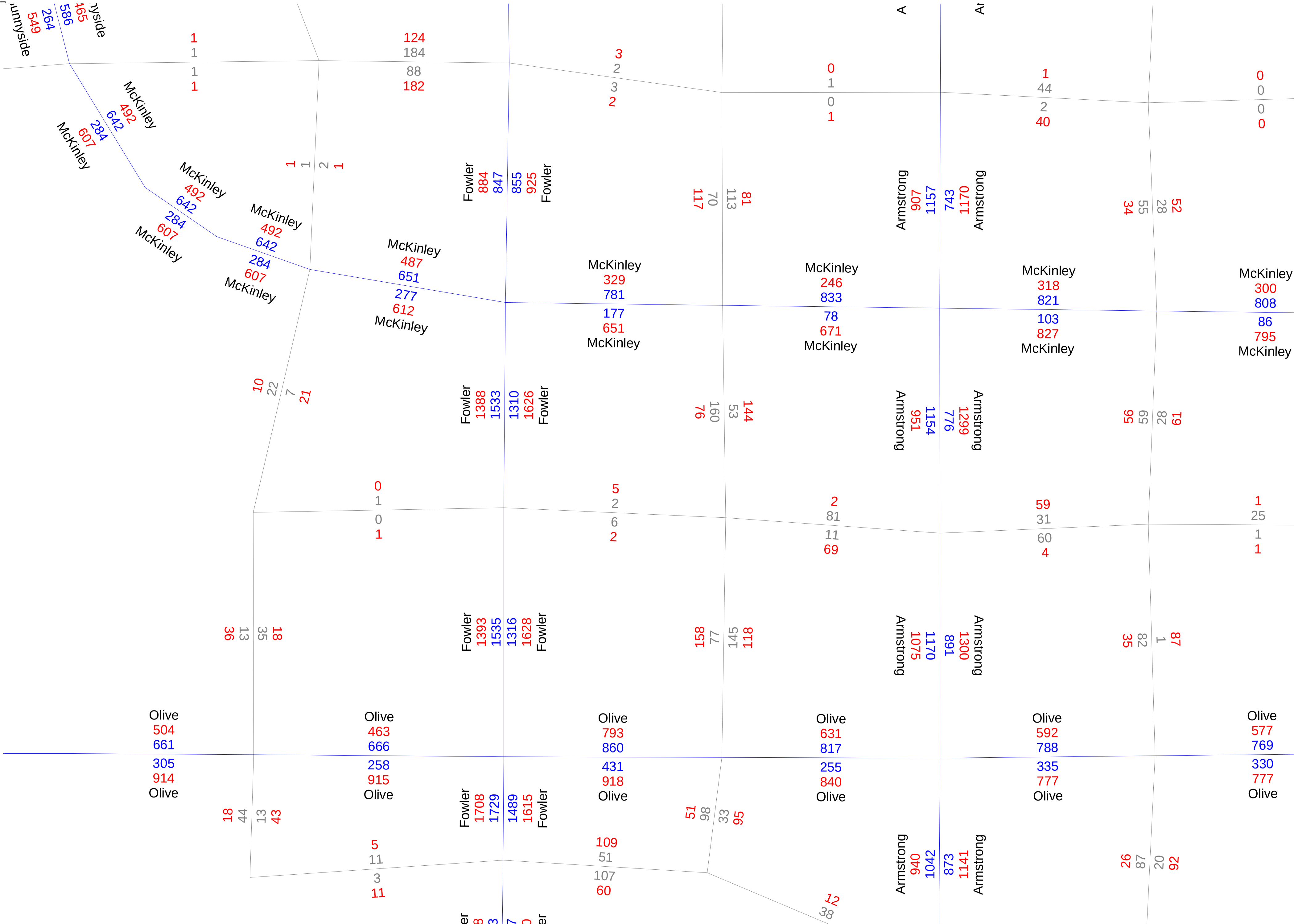
Warrant 3



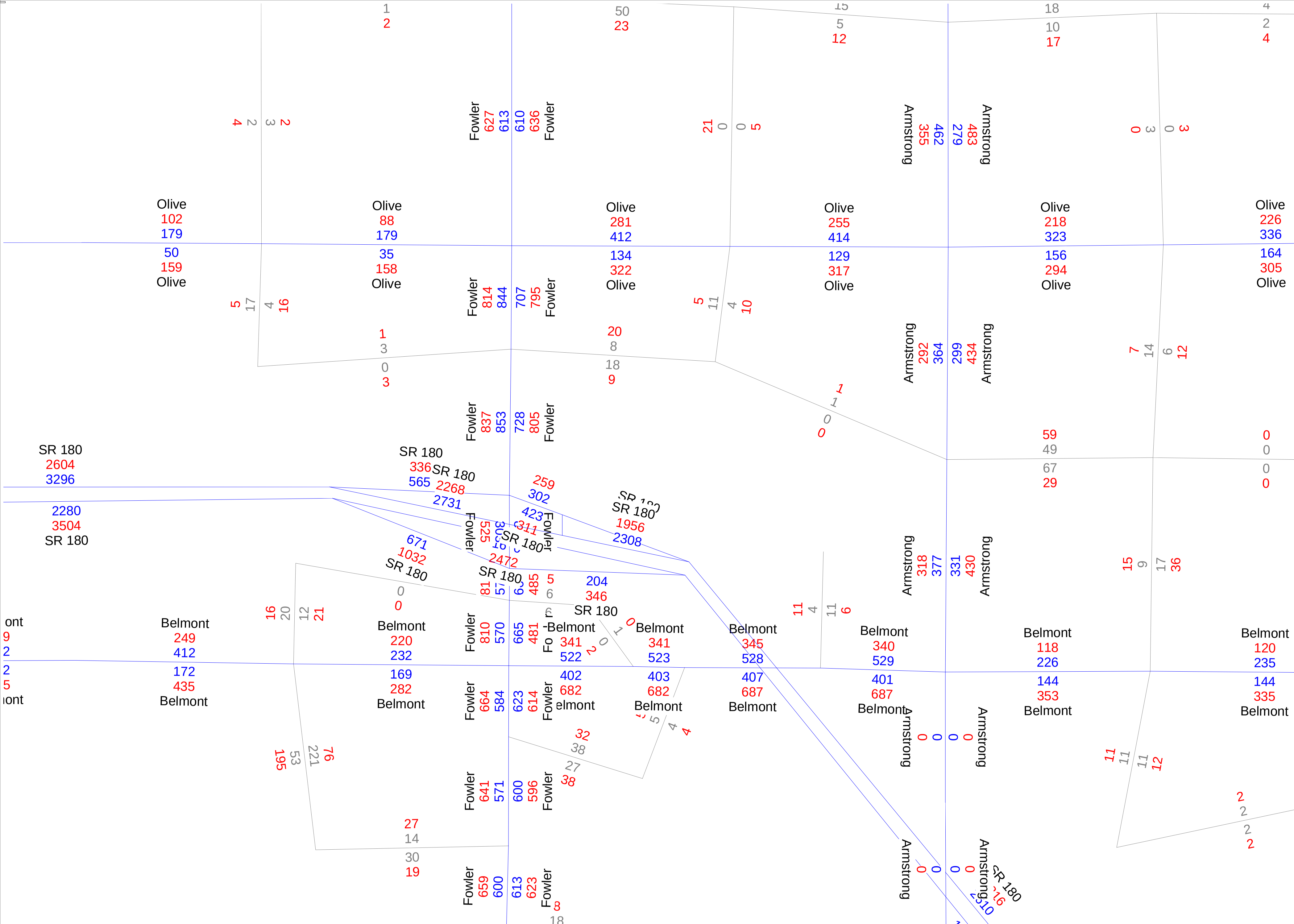
Note: Please turn over for volume information.

APPENDIX G

TRAFFIC MODELING

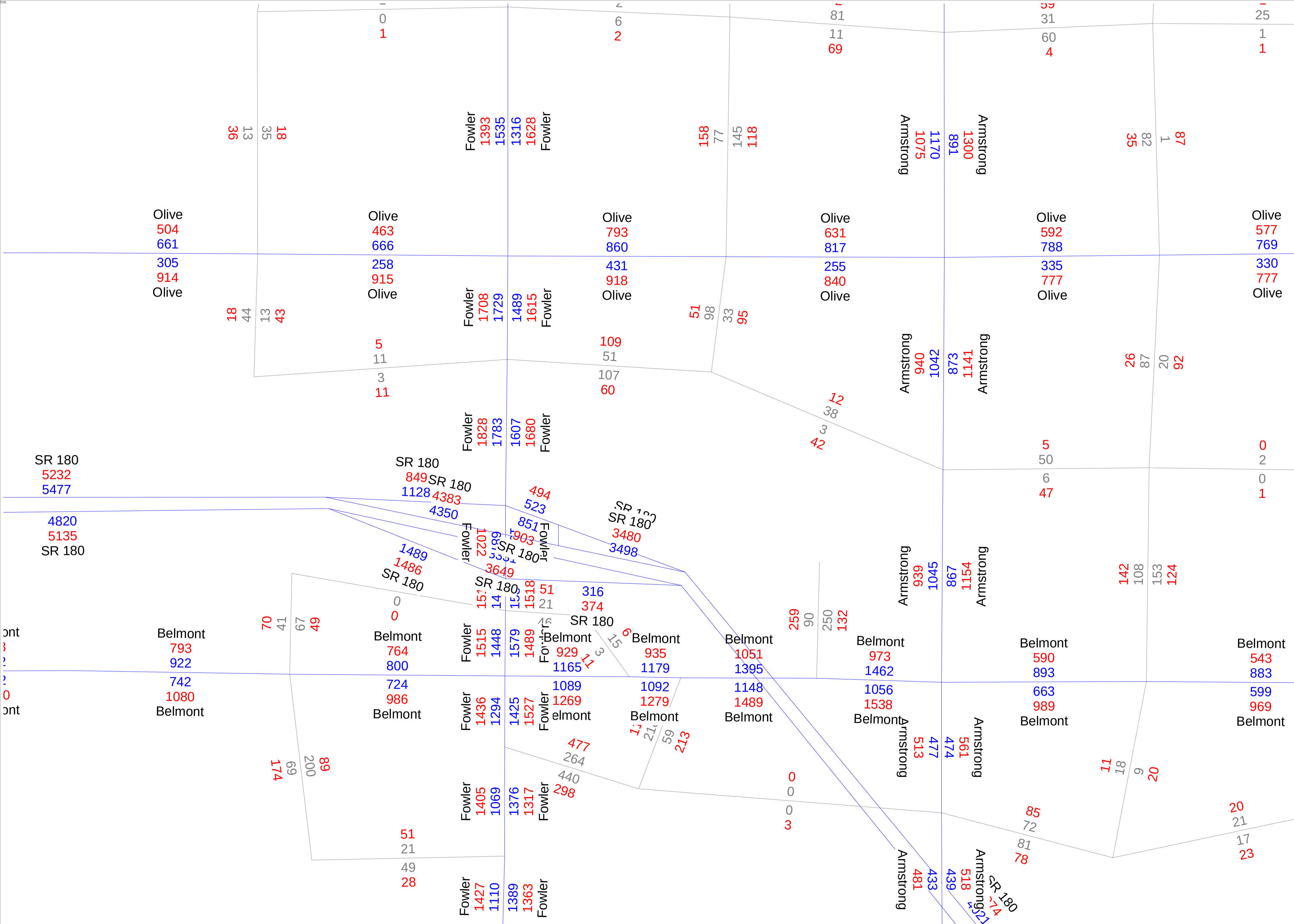


2035 Council Of Fresno County Governments Travel Demand Model
AM and PM Peak Hour Traffic Volumes



2011 Council of Fresno County Governments Travel Demand Model
AM and PM Peak Hour Traffic Volumes

cube



2035 Council Of Fresno County Governments Travel Demand Model
AM and PM Peak Hour Traffic Volumes

cube

Licensed to Peters Engineering

John Rowland

From: Kai Han [KHan@fresnocog.org]
Sent: Thursday, January 05, 2012 12:01 PM
To: John Rowland
Subject: RE: Request for Select Zone Analysis
Attachments: SelectZone Olive and Armstrong.zip; Peters Olive and Armstrong.pdf

Hi John,

Please find attached the results for the select zone analysis of TAZ 1417. Let me know if you have any questions.
Thanks!

Kai Han
Senior Regional Planner
Fresno Council of Governments
2035 Tulare Street, Suite 201
Fresno, CA 93721
Phone: (559)233-4148 ext. 206
Fax: (559)233-9645
Email: khan@fresnocog.org
Website: www.fresnocog.org

From: John Rowland [mailto:JohnRowland@peters-engineering.com]
Sent: Friday, December 23, 2011 11:00 AM
To: Kristine Cai; Kai Han
Subject: Request for Select Zone Analysis

Hello Kristine and Kai,

We are requesting a select zone analysis of TAZ 1417 (near the intersection of Olive and Armstrong) in the 2035 travel model. The Peters Engineering project number is 11-058.01.

Thanks,

John Rowland, PE, TE
PETERS ENGINEERING GROUP
952 Pollasky Avenue
Clovis, California 93612
Phone: (559) 299-1544 Ext. 112
Fax: (559) 299-1722

John Rowland

From: John Rowland
Sent: Friday, December 23, 2011 11:00 AM
To: 'Kristine Cai'; 'Kai Han'
Subject: Request for Select Zone Analysis

Hello Kristine and Kai,

We are requesting a select zone analysis of TAZ 1417 (near the intersection of Olive and Armstrong) in the 2035 travel model. The Peters Engineering project number is 11-058.01.

Thanks,

John Rowland, PE, TE
PETERS ENGINEERING GROUP
952 Pollasky Avenue
Clovis, California 93612
Phone: (559) 299-1544 Ext. 112
Fax: (559) 299-1722

APPENDIX H

PROJECT INTERSECTION ANALYSIS SHEETS

Existing Plus Project Phases 1 and 2 Conditions

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	1	4	334	1	2	357
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.91	0.91	0.94	0.94
Hourly flow rate (vph)	1	5	367	1	2	380
Pedestrians	10		10			10
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	1		1			1
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	772	388			378	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	772	388			378	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	99			100	
cM capacity (veh/h)	361	650			1171	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	6	368	382
Volume Left	1	0	2
Volume Right	5	1	0
cSH	560	1700	1171
Volume to Capacity	0.01	0.22	0.00
Queue Length 95th (ft)	1	0	0
Control Delay (s)	11.5	0.0	0.1
Lane LOS	B		A
Approach Delay (s)	11.5	0.0	0.1
Approach LOS	B		

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	33.2%	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 (veh/h)	2	2	4	16	9	4	3	100	2	2	363	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.66	0.66	0.66	0.71	0.71	0.71
Hourly flow rate (vph)	2	2	5	18	10	5	5	152	3	3	511	1
Pedestrians		10			10			10			10	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	709	701	532	705	700	173	523			165		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	709	701	532	705	700	173	523			165		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	99	99	95	97	99	100			100		
cM capacity (veh/h)	328	354	538	335	355	856	1035			1402		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	9	33	159	515
Volume Left	2	18	5	3
Volume Right	5	5	3	1
cSH	417	372	1035	1402
Volume to Capacity	0.02	0.09	0.00	0.00
Queue Length 95th (ft)	2	7	0	0
Control Delay (s)	13.8	15.6	0.3	0.1
Lane LOS	B	C	A	A
Approach Delay (s)	13.8	15.6	0.3	0.1
Approach LOS	B	C		

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	32.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	26	46	15	379	151	13	17	290	62	3	312	16
Peak Hour Factor	0.90	0.90	0.90	0.83	0.83	0.83	0.88	0.88	0.88	0.92	0.92	0.92
Hourly flow rate (vph)	29	51	17	457	182	16	19	330	70	3	339	17

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	29	68	457	198	419	360
Volume Left (vph)	29	0	457	0	19	3
Volume Right (vph)	0	17	0	16	70	17
Hadj (s)	0.53	-0.14	0.53	-0.02	-0.06	0.01
Departure Headway (s)	9.3	8.7	8.1	7.5	7.0	7.2
Degree Utilization, x	0.07	0.16	1.03	0.41	0.82	0.72
Capacity (veh/h)	355	380	433	475	506	484
Control Delay (s)	11.9	12.1	77.0	14.5	34.1	26.6
Approach Delay (s)	12.1		58.1		34.1	26.6
Approach LOS	B		F		D	D

Intersection Summary			
Delay	41.2		
HCM Level of Service	E		
Intersection Capacity Utilization	64.8%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	28	73	10	34	286	10	36	71	45	21	119	233
Peak Hour Factor	0.77	0.77	0.77	0.83	0.83	0.83	0.72	0.72	0.72	0.76	0.76	0.76
Hourly flow rate (vph)	36	95	13	41	345	12	50	99	62	28	157	307

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	144	398	211	491
Volume Left (vph)	36	41	50	28
Volume Right (vph)	13	12	63	307
Hadj (s)	0.03	0.04	-0.10	-0.33
Departure Headway (s)	7.2	6.5	6.8	5.9
Degree Utilization, x	0.29	0.72	0.40	0.81
Capacity (veh/h)	431	514	469	491
Control Delay (s)	13.1	24.5	14.2	29.4
Approach Delay (s)	13.1	24.5	14.2	29.4
Approach LOS	B	C	B	D

Intersection Summary			
Delay	23.4		
HCM Level of Service	C		
Intersection Capacity Utilization	49.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	8	1	0	5	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	1	0	5	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			10		15	9
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			10		15	9
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1610		1004	1072

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	10	5	0
Volume Left	0	0	0
Volume Right	1	0	0
cSH	1700	1610	1700
Volume to Capacity	0.01	0.00	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	6.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	8	103	540	0	0	3
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	112	587	0	0	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	587				716	587
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	587				716	587
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				100	99
cM capacity (veh/h)	988				393	510

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	121	587	3
Volume Left	9	0	0
Volume Right	0	0	3
cSH	988	1700	510
Volume to Capacity	0.01	0.35	0.01
Queue Length 95th (ft)	1	0	0
Control Delay (s)	0.7	0.0	12.1
Lane LOS	A		B
Approach Delay (s)	0.7	0.0	12.1
Approach LOS			B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	38.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	6	3	540	5	2	482
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.91	0.91	0.88	0.88
Hourly flow rate (vph)	7	3	593	5	2	548
Pedestrians	10		10			10
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	1		1			1
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1168	616			609	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1168	616			609	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	99			100	
cM capacity (veh/h)	209	481			957	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	10	599	550
Volume Left	7	0	2
Volume Right	3	5	0
cSH	257	1700	957
Volume to Capacity	0.04	0.35	0.00
Queue Length 95th (ft)	3	0	0
Control Delay (s)	19.6	0.0	0.1
Lane LOS	C		A
Approach Delay (s)	19.6	0.0	0.1
Approach LOS	C		

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	41.6%	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 (veh/h)	2	5	2	3	4	4	1	196	9	5	101	1
Sign Control		Stop			Stop			Free			Free	
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)	2	5	2	3	4	4	1	213	10	5	110	1
Pedestrians		10			10			10			10	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	368	366	130	366	362	238	121			233		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	368	366	130	366	362	238	121			233		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	99	100	99	99	99	100			100		
cM capacity (veh/h)	561	549	901	563	552	785	1448			1318		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	10	12	224	116
Volume Left	2	3	1	5
Volume Right	2	4	10	1
cSH	604	623	1448	1318
Volume to Capacity	0.02	0.02	0.00	0.00
Queue Length 95th (ft)	1	1	0	0
Control Delay (s)	11.1	10.9	0.0	0.4
Lane LOS	B	B	A	A
Approach Delay (s)	11.1	10.9	0.0	0.4
Approach LOS	B	B		

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	24.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	75	105	43	102	60	7	10	455	96	5	428	51
Peak Hour Factor	0.90	0.90	0.90	0.83	0.83	0.83	0.88	0.88	0.88	0.92	0.92	0.92
Hourly flow rate (vph)	83	117	48	123	72	8	11	517	109	5	465	55

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	83	164	123	81	638	526
Volume Left (vph)	83	0	123	0	11	5
Volume Right (vph)	0	48	0	8	109	55
Hadj (s)	0.55	-0.15	0.55	-0.02	-0.05	-0.01
Departure Headway (s)	9.0	8.3	9.1	8.6	6.9	6.9
Degree Utilization, x	0.21	0.38	0.31	0.19	1.22	1.00
Capacity (veh/h)	391	424	383	409	529	526
Control Delay (s)	13.2	15.1	15.0	12.4	139.2	65.6
Approach Delay (s)	14.5		14.0		139.2	65.6
Approach LOS	B		B		F	F

Intersection Summary			
Delay	80.3		
HCM Level of Service	F		
Intersection Capacity Utilization	61.7%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	88	139	1	7	88	7	5	109	21	6	44	47
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)	96	151	1	8	96	8	5	118	23	7	48	51

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	248	111	147	105
Volume Left (vph)	96	8	5	7
Volume Right (vph)	1	8	23	51
Hadj (s)	0.13	0.02	-0.03	-0.23
Departure Headway (s)	4.8	4.9	4.9	4.8
Degree Utilization, x	0.33	0.15	0.20	0.14
Capacity (veh/h)	707	683	679	685
Control Delay (s)	10.2	8.7	9.1	8.6
Approach Delay (s)	10.2	8.7	9.1	8.6
Approach LOS	B	A	A	A

Intersection Summary			
Delay	9.4		
HCM Level of Service	A		
Intersection Capacity Utilization	35.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	9	0	0	8	1	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	0	0	9	1	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			10		18	10
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			10		18	10
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1603		997	1069

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	10	9	1
Volume Left	0	0	1
Volume Right	0	0	0
cSH	1700	1603	997
Volume to Capacity	0.01	0.00	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	8.6
Lane LOS			A
Approach Delay (s)	0.0	0.0	8.6
Approach LOS			A

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	3	203	161	0	0	8
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	221	175	0	0	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	175				402	175
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	175				402	175
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	99
cM capacity (veh/h)	1395				601	866

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	224	175	9
Volume Left	3	0	0
Volume Right	0	0	9
cSH	1395	1700	866
Volume to Capacity	0.00	0.10	0.01
Queue Length 95th (ft)	0	0	1
Control Delay (s)	0.1	0.0	9.2
Lane LOS	A		A
Approach Delay (s)	0.1	0.0	9.2
Approach LOS			A

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	23.1%	ICU Level of Service	A
Analysis Period (min)	15		

Existing Plus Project Phases 1 Through 3 Conditions

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	44	18	337	20	9	357
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.91	0.91	0.94	0.94
Hourly flow rate (vph)	50	20	370	22	10	380
Pedestrians	10		10			10
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	1		1			1
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	800	401			402	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	800	401			402	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	86	97			99	
cM capacity (veh/h)	345	638			1147	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	70	392	389
Volume Left	50	0	10
Volume Right	20	22	0
cSH	398	1700	1147
Volume to Capacity	0.18	0.23	0.01
Queue Length 95th (ft)	16	0	1
Control Delay (s)	16.0	0.0	0.3
Lane LOS	C		A
Approach Delay (s)	16.0	0.0	0.3
Approach LOS	C		

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	39.2%	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 (veh/h)	9	2	6	16	9	4	5	100	2	2	363	4
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.66	0.66	0.66	0.71	0.71	0.71
Hourly flow rate (vph)	10	2	7	18	10	5	8	152	3	3	511	6
Pedestrians		10			10			10			10	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	718	709	534	716	711	173	527			165		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	718	709	534	716	711	173	527			165		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	99	99	94	97	99	99			100		
cM capacity (veh/h)	323	350	537	327	349	856	1031			1402		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	19	33	162	520
Volume Left	10	18	8	3
Volume Right	7	5	3	6
cSH	380	365	1031	1402
Volume to Capacity	0.05	0.09	0.01	0.00
Queue Length 95th (ft)	4	7	1	0
Control Delay (s)	15.0	15.8	0.5	0.1
Lane LOS	B	C	A	A
Approach Delay (s)	15.0	15.8	0.5	0.1
Approach LOS	B	C		

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	32.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	28	51	15	462	163	16	17	307	96	3	350	21
Peak Hour Factor	0.90	0.90	0.90	0.83	0.83	0.83	0.88	0.88	0.88	0.92	0.92	0.92
Hourly flow rate (vph)	31	57	17	557	196	19	19	349	109	3	380	23

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	31	73	557	216	477	407
Volume Left (vph)	31	0	557	0	19	3
Volume Right (vph)	0	17	0	19	109	23
Hadj (s)	0.53	-0.13	0.53	-0.03	-0.10	0.00
Departure Headway (s)	9.9	9.2	8.6	8.0	7.2	7.5
Degree Utilization, x	0.09	0.19	1.32	0.48	0.96	0.84
Capacity (veh/h)	349	374	406	448	494	473
Control Delay (s)	12.6	13.1	185.0	16.8	56.9	39.2
Approach Delay (s)	13.0		138.0		56.9	39.2
Approach LOS	B		F		F	E

Intersection Summary			
Delay	85.8		
HCM Level of Service	F		
Intersection Capacity Utilization	72.7%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	28	75	12	34	287	11	37	72	45	22	120	233
Peak Hour Factor	0.77	0.77	0.77	0.83	0.83	0.83	0.72	0.72	0.72	0.76	0.76	0.76
Hourly flow rate (vph)	36	97	16	41	346	13	51	100	62	29	158	307

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	149	400	214	493
Volume Left (vph)	36	41	51	29
Volume Right (vph)	16	13	63	307
Hadj (s)	0.02	0.03	-0.09	-0.33
Departure Headway (s)	7.3	6.6	6.9	6.0
Degree Utilization, x	0.30	0.73	0.41	0.83
Capacity (veh/h)	427	510	464	569
Control Delay (s)	13.5	25.8	14.6	31.5
Approach Delay (s)	13.5	25.8	14.6	31.5
Approach LOS	B	D	B	D

Intersection Summary			
Delay	24.7		
HCM Level of Service	C		
Intersection Capacity Utilization	50.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	8	27	5	5	57	9
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	29	5	5	62	10
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			38		40	23
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			38		40	23
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		94	99
cM capacity (veh/h)			1572		969	1053

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	38	11	72
Volume Left	0	5	62
Volume Right	29	0	10
cSH	1700	1572	979
Volume to Capacity	0.02	0.00	0.07
Queue Length 95th (ft)	0	0	6
Control Delay (s)	0.0	3.7	9.0
Lane LOS		A	A
Approach Delay (s)	0.0	3.7	9.0
Approach LOS			A

Intersection Summary			
Average Delay	5.7		
Intersection Capacity Utilization	15.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	47	103	540	2	4	101
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	51	112	587	2	4	110
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	589				802	588
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	589				802	588
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				99	78
cM capacity (veh/h)	986				335	509

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	163	589	114
Volume Left	51	0	4
Volume Right	0	2	110
cSH	986	1700	499
Volume to Capacity	0.05	0.35	0.23
Queue Length 95th (ft)	4	0	22
Control Delay (s)	3.1	0.0	14.3
Lane LOS	A		B
Approach Delay (s)	3.1	0.0	14.3
Approach LOS			B

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	53.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	25	8	542	6	3	482
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.91	0.91	0.88	0.88
Hourly flow rate (vph)	28	9	596	7	3	548
Pedestrians	10		10			10
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	1		1			1
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1173	619			612	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1173	619			612	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	86	98			100	
cM capacity (veh/h)	207	479			954	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	38	602	551
Volume Left	28	0	3
Volume Right	9	7	0
cSH	240	1700	954
Volume to Capacity	0.16	0.35	0.00
Queue Length 95th (ft)	14	0	0
Control Delay (s)	22.8	0.0	0.1
Lane LOS	C		A
Approach Delay (s)	22.8	0.0	0.1
Approach LOS	C		

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	41.7%	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 (veh/h)	5	5	4	3	4	4	1	196	9	5	101	1
Sign Control		Stop			Stop			Free			Free	
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)	5	5	4	3	4	4	1	213	10	5	110	1
Pedestrians		10			10			10			10	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	368	366	130	368	362	238	121			233		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	368	366	130	368	362	238	121			233		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	99	100	99	99	99	100			100		
cM capacity (veh/h)	561	549	901	560	552	785	1448			1318		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	15	12	224	116
Volume Left	5	3	1	5
Volume Right	4	4	10	1
cSH	623	622	1448	1318
Volume to Capacity	0.02	0.02	0.00	0.00
Queue Length 95th (ft)	2	1	0	0
Control Delay (s)	10.9	10.9	0.0	0.4
Lane LOS	B	B	A	A
Approach Delay (s)	10.9	10.9	0.0	0.4
Approach LOS	B	B		

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	24.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	75	106	43	136	65	9	10	456	96	5	445	53
Peak Hour Factor	0.90	0.90	0.90	0.83	0.83	0.83	0.88	0.88	0.88	0.92	0.92	0.92
Hourly flow rate (vph)	83	118	48	164	78	11	11	518	109	5	484	58

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	83	166	164	89	639	547
Volume Left (vph)	83	0	164	0	11	5
Volume Right (vph)	0	48	0	11	109	58
Hadj (s)	0.55	-0.15	0.55	-0.03	-0.05	-0.01
Departure Headway (s)	9.2	8.5	9.2	8.6	7.1	7.1
Degree Utilization, x	0.21	0.39	0.42	0.21	1.25	1.08
Capacity (veh/h)	382	414	384	410	517	516
Control Delay (s)	13.5	15.7	17.4	12.7	152.2	89.2
Approach Delay (s)	15.0		15.7		152.2	89.2
Approach LOS	B		C		F	F

Intersection Summary			
Delay	91.1		
HCM Level of Service	F		
Intersection Capacity Utilization	63.8%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	88	140	2	7	88	7	5	109	21	7	45	47
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)	96	152	2	8	96	8	5	118	23	8	49	51

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	250	111	147	108
Volume Left (vph)	96	8	5	8
Volume Right (vph)	2	8	23	51
Hadj (s)	0.12	0.02	-0.03	-0.22
Departure Headway (s)	4.8	4.9	4.9	4.8
Degree Utilization, x	0.33	0.15	0.20	0.14
Capacity (veh/h)	706	681	677	683
Control Delay (s)	10.2	8.8	9.1	8.6
Approach Delay (s)	10.2	8.8	9.1	8.6
Approach LOS	B	A	A	A

Intersection Summary			
Delay	9.4		
HCM Level of Service	A		
Intersection Capacity Utilization	35.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	9	2	0	8	25	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	2	0	9	27	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			12		20	11
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			12		20	11
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		97	99
cM capacity (veh/h)			1600		995	1067

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	12	9	33
Volume Left	0	0	27
Volume Right	2	0	5
cSH	1700	1600	1006
Volume to Capacity	0.01	0.00	0.03
Queue Length 95th (ft)	0	0	3
Control Delay (s)	0.0	0.0	8.7
Lane LOS			A
Approach Delay (s)	0.0	0.0	8.7
Approach LOS			A

Intersection Summary			
Average Delay	5.3		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	4	203	161	0	2	49
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	221	175	0	2	53
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	175				404	175
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	175				404	175
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	94
cM capacity (veh/h)	1395				599	866

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	225	175	55
Volume Left	4	0	2
Volume Right	0	0	53
cSH	1395	1700	851
Volume to Capacity	0.00	0.10	0.07
Queue Length 95th (ft)	0	0	5
Control Delay (s)	0.2	0.0	9.5
Lane LOS	A		A
Approach Delay (s)	0.2	0.0	9.5
Approach LOS			A

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	23.9%	ICU Level of Service	A
Analysis Period (min)	15		

Near-Term With-Project Phases 1 and 2 Conditions

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	1	4	452	1	2	480
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.91	0.91	0.94	0.94
Hourly flow rate (vph)	1	5	497	1	2	511
Pedestrians	10		10			10
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	1		1			1
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1032	517			508	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1032	517			508	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	99			100	
cM capacity (veh/h)	253	549			1048	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	6	498	513
Volume Left	1	0	2
Volume Right	5	1	0
cSH	445	1700	1048
Volume to Capacity	0.01	0.29	0.00
Queue Length 95th (ft)	1	0	0
Control Delay (s)	13.2	0.0	0.1
Lane LOS	B		A
Approach Delay (s)	13.2	0.0	0.1
Approach LOS	B		

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	39.7%	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 (veh/h)	2	2	4	16	9	4	3	109	2	2	380	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.66	0.66	0.66	0.71	0.71	0.71
Hourly flow rate (vph)	2	2	5	18	10	5	5	165	3	3	535	1
Pedestrians		10			10			10			10	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	747	739	556	743	738	187	547			178		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	747	739	556	743	738	187	547			178		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	99	99	94	97	99	100			100		
cM capacity (veh/h)	309	337	522	316	338	841	1014			1386		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	9	33	173	539
Volume Left	2	18	5	3
Volume Right	5	5	3	1
cSH	399	353	1014	1386
Volume to Capacity	0.02	0.09	0.00	0.00
Queue Length 95th (ft)	2	8	0	0
Control Delay (s)	14.2	16.2	0.3	0.1
Lane LOS	B	C	A	A
Approach Delay (s)	14.2	16.2	0.3	0.1
Approach LOS	B	C		

Intersection Summary			
Average Delay	1.0		
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												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	27	54	37	395	158	16	32	404	67	15	421	16
Peak Hour Factor	0.90	0.90	0.90	0.83	0.83	0.83	0.88	0.88	0.88	0.92	0.92	0.92
Hourly flow rate (vph)	30	60	41	476	190	19	36	459	76	16	458	17

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	30	101	476	210	572	491
Volume Left (vph)	30	0	476	0	36	16
Volume Right (vph)	0	41	0	19	76	17
Hadj (s)	0.53	-0.25	0.53	-0.03	-0.03	0.02
Departure Headway (s)	10.2	9.4	8.8	8.2	7.7	7.8
Degree Utilization, x	0.08	0.26	1.16	0.48	1.23	1.06
Capacity (veh/h)	349	379	405	435	473	470
Control Delay (s)	12.9	14.5	123.0	17.3	144.6	87.1
Approach Delay (s)	14.1		90.7		144.6	87.1
Approach LOS	B		F		F	F

Intersection Summary			
Delay	100.8		
HCM Level of Service	F		
Intersection Capacity Utilization	74.5%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	31	95	10	35	303	14	37	73	46	26	123	242
Peak Hour Factor	0.77	0.77	0.77	0.83	0.83	0.83	0.72	0.72	0.72	0.76	0.76	0.76
Hourly flow rate (vph)	40	123	13	42	365	17	51	101	64	34	162	318

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	177	424	217	514
Volume Left (vph)	40	42	51	34
Volume Right (vph)	13	17	64	318
Hadj (s)	0.04	0.03	-0.10	-0.32
Departure Headway (s)	7.8	7.0	7.4	6.4
Degree Utilization, x	0.38	0.82	0.45	0.92
Capacity (veh/h)	418	424	444	545
Control Delay (s)	15.5	34.5	16.3	45.3
Approach Delay (s)	15.5	34.5	16.3	45.3
Approach LOS	C	D	C	E

Intersection Summary			
Delay	33.2		
HCM Level of Service	D		
Intersection Capacity Utilization	52.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	9	1	0	5	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	1	0	5	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			11		16	10
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			11		16	10
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1608		1003	1071

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	11	5	0
Volume Left	0	0	0
Volume Right	1	0	0
cSH	1700	1608	1700
Volume to Capacity	0.01	0.00	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	6.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	8	135	600	0	0	3
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	147	652	0	0	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	652				816	652
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	652				816	652
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				100	99
cM capacity (veh/h)	934				343	468

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	155	652	3
Volume Left	9	0	0
Volume Right	0	0	3
cSH	934	1700	468
Volume to Capacity	0.01	0.38	0.01
Queue Length 95th (ft)	1	0	1
Control Delay (s)	0.6	0.0	12.7
Lane LOS	A		B
Approach Delay (s)	0.6	0.0	12.7
Approach LOS			B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	41.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	6	3	744	5	2	669
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.91	0.91	0.88	0.88
Hourly flow rate (vph)	7	3	818	5	2	760
Pedestrians	10		10			10
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	1		1			1
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1605	840			833	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1605	840			833	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	94	99			100	
cM capacity (veh/h)	113	357			789	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	10	823	762
Volume Left	7	0	2
Volume Right	3	5	0
cSH	146	1700	789
Volume to Capacity	0.07	0.48	0.00
Queue Length 95th (ft)	6	0	0
Control Delay (s)	31.4	0.0	0.1
Lane LOS	D		A
Approach Delay (s)	31.4	0.0	0.1
Approach LOS	D		

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	52.3%	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 (veh/h)	2	5	2	3	4	4	1	209	9	5	111	1
Sign Control		Stop			Stop			Free			Free	
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)	2	5	2	3	4	4	1	227	10	5	121	1
Pedestrians		10			10			10			10	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	393	391	141	391	387	252	132			247		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	393	391	141	391	387	252	132			247		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	99	100	99	99	99	100			100		
cM capacity (veh/h)	540	531	889	542	534	771	1435			1302		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	10	12	238	127
Volume Left	2	3	1	5
Volume Right	2	4	10	1
cSH	586	604	1435	1302
Volume to Capacity	0.02	0.02	0.00	0.00
Queue Length 95th (ft)	1	2	0	0
Control Delay (s)	11.3	11.1	0.0	0.4
Lane LOS	B	B	A	A
Approach Delay (s)	11.3	11.1	0.0	0.4
Approach LOS	B	B		

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	25.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	77	113	79	113	75	13	34	651	113	14	604	53
Peak Hour Factor	0.90	0.90	0.90	0.83	0.83	0.83	0.88	0.88	0.88	0.92	0.92	0.92
Hourly flow rate (vph)	86	126	88	136	90	16	39	740	128	15	657	58

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	86	213	136	106	907	729
Volume Left (vph)	86	0	136	0	39	15
Volume Right (vph)	0	88	0	16	128	58
Hadj (s)	0.55	-0.24	0.55	-0.05	-0.03	0.01
Departure Headway (s)	9.2	8.4	9.3	8.8	7.2	7.3
Degree Utilization, x	0.22	0.50	0.35	0.26	1.82	1.47
Capacity (veh/h)	385	413	376	402	503	498
Control Delay (s)	13.5	18.2	16.2	13.6	396.7	244.3
Approach Delay (s)	16.9		15.0		396.7	244.3
Approach LOS	C		C		F	F

Intersection Summary			
Delay	251.1		
HCM Level of Service	F		
Intersection Capacity Utilization	87.0%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	95	167	1	7	115	10	5	112	22	10	45	51
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)	103	182	1	8	125	11	5	122	24	11	49	55

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	286	143	151	115
Volume Left (vph)	103	8	5	11
Volume Right (vph)	1	11	24	55
Hadj (s)	0.12	0.02	-0.04	-0.22
Departure Headway (s)	4.9	5.0	5.1	5.0
Degree Utilization, x	0.39	0.20	0.21	0.16
Capacity (veh/h)	692	664	642	647
Control Delay (s)	11.0	9.2	9.5	9.0
Approach Delay (s)	11.0	9.2	9.5	9.0
Approach LOS	B	A	A	A

Intersection Summary			
Delay	10.0		
HCM Level of Service	A		
Intersection Capacity Utilization	44.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	10	0	0	9	1	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	0	0	10	1	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			11		21	11
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			11		21	11
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1602		994	1067

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	11	10	1
Volume Left	0	0	1
Volume Right	0	0	0
cSH	1700	1602	994
Volume to Capacity	0.01	0.00	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	8.6
Lane LOS			A
Approach Delay (s)	0.0	0.0	8.6
Approach LOS			A

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	3	250	203	0	0	8
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	272	221	0	0	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	221				499	221
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	221				499	221
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	99
cM capacity (veh/h)	1343				528	816

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	275	221	9
Volume Left	3	0	0
Volume Right	0	0	9
cSH	1343	1700	816
Volume to Capacity	0.00	0.13	0.01
Queue Length 95th (ft)	0	0	1
Control Delay (s)	0.1	0.0	9.5
Lane LOS	A		A
Approach Delay (s)	0.1	0.0	9.5
Approach LOS			A

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	25.6%	ICU Level of Service	A
Analysis Period (min)	15		

Near-Term With-Project Phases 1 Through 3 Conditions

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	44	18	455	20	9	480
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.91	0.91	0.94	0.94
Hourly flow rate (vph)	50	20	500	22	10	511
Pedestrians	10		10			10
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	1		1			1
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1061	531			532	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1061	531			532	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	79	96			99	
cM capacity (veh/h)	242	539			1027	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	70	522	520
Volume Left	50	0	10
Volume Right	20	22	0
cSH	288	1700	1027
Volume to Capacity	0.24	0.31	0.01
Queue Length 95th (ft)	24	0	1
Control Delay (s)	21.5	0.0	0.3
Lane LOS	C		A
Approach Delay (s)	21.5	0.0	0.3
Approach LOS	C		

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	45.7%	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 (veh/h)	9	2	6	16	9	4	5	109	2	2	380	4
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.66	0.66	0.66	0.71	0.71	0.71
Hourly flow rate (vph)	10	2	7	18	10	5	8	165	3	3	535	6
Pedestrians		10			10			10			10	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	755	747	558	753	748	187	551			178		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	755	747	558	753	748	187	551			178		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	99	99	94	97	99	99			100		
cM capacity (veh/h)	304	333	520	308	332	841	1010			1386		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	19	33	176	544
Volume Left	10	18	8	3
Volume Right	7	5	3	6
cSH	361	346	1010	1386
Volume to Capacity	0.05	0.10	0.01	0.00
Queue Length 95th (ft)	4	8	1	0
Control Delay (s)	15.5	16.5	0.4	0.1
Lane LOS	C	C	A	A
Approach Delay (s)	15.5	16.5	0.4	0.1
Approach LOS	C	C		

Intersection Summary			
Average Delay	1.2		
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												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	29	59	37	478	170	19	32	421	101	15	459	21
Peak Hour Factor	0.90	0.90	0.90	0.83	0.83	0.83	0.88	0.88	0.88	0.92	0.92	0.92
Hourly flow rate (vph)	32	66	41	576	205	23	36	478	115	16	499	23

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	32	107	576	228	630	538
Volume Left (vph)	32	0	576	0	36	16
Volume Right (vph)	0	41	0	23	115	23
Hadj (s)	0.53	-0.24	0.53	-0.04	-0.06	0.01
Departure Headway (s)	10.2	9.4	8.8	8.2	7.7	7.8
Degree Utilization, x	0.09	0.28	1.41	0.52	1.35	1.17
Capacity (veh/h)	349	379	411	424	475	465
Control Delay (s)	13.0	14.8	221.1	18.7	195.3	123.1
Approach Delay (s)	14.4		163.7		195.3	123.1
Approach LOS	B		F		F	F

Intersection Summary			
Delay	153.0		
HCM Level of Service	F		
Intersection Capacity Utilization	82.8%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	31	97	12	35	304	15	38	74	46	27	124	242
Peak Hour Factor	0.77	0.77	0.77	0.83	0.83	0.83	0.72	0.72	0.72	0.76	0.76	0.76
Hourly flow rate (vph)	40	126	16	42	366	18	53	103	64	36	163	318

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	182	427	219	517
Volume Left (vph)	40	42	53	36
Volume Right (vph)	16	18	64	318
Hadj (s)	0.03	0.03	-0.09	-0.32
Departure Headway (s)	7.9	7.0	7.5	6.5
Degree Utilization, x	0.40	0.83	0.46	0.93
Capacity (veh/h)	417	427	441	541
Control Delay (s)	15.9	36.4	16.7	48.5
Approach Delay (s)	15.9	36.4	16.7	48.5
Approach LOS	C	E	C	E

Intersection Summary			
Delay	35.0		
HCM Level of Service	E		
Intersection Capacity Utilization	52.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	9	27	5	5	57	9
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	29	5	5	62	10
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			39		41	24
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			39		41	24
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		94	99
cM capacity (veh/h)			1571		967	1052

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	39	11	72
Volume Left	0	5	62
Volume Right	29	0	10
cSH	1700	1571	978
Volume to Capacity	0.02	0.00	0.07
Queue Length 95th (ft)	0	0	6
Control Delay (s)	0.0	3.7	9.0
Lane LOS		A	A
Approach Delay (s)	0.0	3.7	9.0
Approach LOS			A

Intersection Summary			
Average Delay	5.6		
Intersection Capacity Utilization	15.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	47	135	600	2	4	101
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	51	147	652	2	4	110
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	654				902	653
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	654				902	653
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				99	76
cM capacity (veh/h)	933				291	467

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	198	654	114
Volume Left	51	0	4
Volume Right	0	2	110
cSH	933	1700	457
Volume to Capacity	0.05	0.38	0.25
Queue Length 95th (ft)	4	0	24
Control Delay (s)	2.7	0.0	15.5
Lane LOS	A		C
Approach Delay (s)	2.7	0.0	15.5
Approach LOS			C

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	57.9%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	25	8	746	6	3	669
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.91	0.91	0.88	0.88
Hourly flow rate (vph)	28	9	820	7	3	760
Pedestrians	10		10			10
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	1		1			1
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1610	843			836	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1610	843			836	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	75	97			100	
cM capacity (veh/h)	112	356			787	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	38	826	764
Volume Left	28	0	3
Volume Right	9	7	0
cSH	134	1700	787
Volume to Capacity	0.28	0.49	0.00
Queue Length 95th (ft)	27	0	0
Control Delay (s)	41.9	0.0	0.1
Lane LOS	E		A
Approach Delay (s)	41.9	0.0	0.1
Approach LOS	E		

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	52.5%	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 (veh/h)	5	5	4	3	4	4	1	209	9	5	111	1
Sign Control		Stop			Stop			Free			Free	
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)	5	5	4	3	4	4	1	227	10	5	121	1
Pedestrians		10			10			10			10	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	393	391	141	393	387	252	132			247		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	393	391	141	393	387	252	132			247		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	99	100	99	99	99	100			100		
cM capacity (veh/h)	540	531	889	539	534	771	1435			1302		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	15	12	238	127
Volume Left	5	3	1	5
Volume Right	4	4	10	1
cSH	604	603	1435	1302
Volume to Capacity	0.03	0.02	0.00	0.00
Queue Length 95th (ft)	2	2	0	0
Control Delay (s)	11.1	11.1	0.0	0.4
Lane LOS	B	B	A	A
Approach Delay (s)	11.1	11.1	0.0	0.4
Approach LOS	B	B		

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	25.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	77	114	79	147	80	15	34	652	113	14	621	55
Peak Hour Factor	0.90	0.90	0.90	0.83	0.83	0.83	0.88	0.88	0.88	0.92	0.92	0.92
Hourly flow rate (vph)	86	127	88	177	96	18	39	741	128	15	675	60

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	86	214	177	114	908	750
Volume Left (vph)	86	0	177	0	39	15
Volume Right (vph)	0	88	0	18	128	60
Hadj (s)	0.55	-0.24	0.55	-0.06	-0.03	0.01
Departure Headway (s)	9.4	8.6	9.4	8.8	7.5	7.5
Degree Utilization, x	0.22	0.51	0.46	0.28	1.89	1.57
Capacity (veh/h)	377	404	377	402	488	483
Control Delay (s)	13.8	19.0	19.0	13.9	425.6	284.8
Approach Delay (s)	17.5		17.0		425.6	284.8
Approach LOS	C		C		F	F

Intersection Summary			
Delay	271.2		
HCM Level of Service	F		
Intersection Capacity Utilization	89.1%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	95	168	2	7	115	10	5	112	22	11	46	51
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)	103	183	2	8	125	11	5	122	24	12	50	55

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	288	143	151	117
Volume Left (vph)	103	8	5	12
Volume Right (vph)	2	11	24	55
Hadj (s)	0.12	0.02	-0.04	-0.21
Departure Headway (s)	4.9	5.0	5.1	5.0
Degree Utilization, x	0.39	0.20	0.22	0.16
Capacity (veh/h)	691	662	641	645
Control Delay (s)	11.1	9.3	9.5	9.0
Approach Delay (s)	11.1	9.3	9.5	9.0
Approach LOS	B	A	A	A

Intersection Summary			
Delay	10.0		
HCM Level of Service	B		
Intersection Capacity Utilization	44.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	10	2	0	9	25	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	2	0	10	27	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			13		22	12
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			13		22	12
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		97	99
cM capacity (veh/h)			1599		992	1066

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	13	10	33
Volume Left	0	0	27
Volume Right	2	0	5
cSH	1700	1599	1004
Volume to Capacity	0.01	0.00	0.03
Queue Length 95th (ft)	0	0	3
Control Delay (s)	0.0	0.0	8.7
Lane LOS			A
Approach Delay (s)	0.0	0.0	8.7
Approach LOS			A

Intersection Summary			
Average Delay	5.1		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	4	250	203	0	2	49
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	272	221	0	2	53
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	221				501	221
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	221				501	221
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	93
cM capacity (veh/h)	1343				526	816

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	276	221	55
Volume Left	4	0	2
Volume Right	0	0	53
cSH	1343	1700	799
Volume to Capacity	0.00	0.13	0.07
Queue Length 95th (ft)	0	0	6
Control Delay (s)	0.2	0.0	9.8
Lane LOS	A		A
Approach Delay (s)	0.2	0.0	9.8
Approach LOS			A

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	26.4%	ICU Level of Service	A
Analysis Period (min)	15		

Long-Term (Year 2035) With-Project Conditions

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	45	22	1028	21	10	1251
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	49	24	1117	23	11	1360
Pedestrians	10		10			10
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	1		1			1
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2530	1149			1150	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2530	1149			1150	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	90			98	
cM capacity (veh/h)	29	238			602	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	73	1140	1371
Volume Left	49	0	11
Volume Right	24	23	0
cSH	41	1700	602
Volume to Capacity	1.77	0.67	0.02
Queue Length 95th (ft)	189	0	1
Control Delay (s)	582.1	0.0	1.1
Lane LOS	F		A
Approach Delay (s)	582.1	0.0	1.1
Approach LOS	F		

Intersection Summary			
Average Delay	17.0		
Intersection Capacity Utilization	87.2%	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 (veh/h)	11	4	10	32	18	8	8	710	4	4	1041	5
Sign Control		Stop			Stop			Free			Free	
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)	12	4	11	35	20	9	9	772	4	4	1132	5
Pedestrians		10			10			10			10	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1973	1956	1154	1967	1957	794	1147			786		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1973	1956	1154	1967	1957	794	1147			786		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	64	93	95	14	68	98	99			99		
cM capacity (veh/h)	33	61	236	41	61	382	604			826		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	27	63	785	1141
Volume Left	12	35	9	4
Volume Right	11	9	4	5
cSH	57	53	604	826
Volume to Capacity	0.48	1.20	0.01	0.01
Queue Length 95th (ft)	46	139	1	0
Control Delay (s)	117.3	314.7	0.4	0.2
Lane LOS	F	F	A	A
Approach Delay (s)	117.3	314.7	0.4	0.2
Approach LOS	F	F		

Intersection Summary			
Average Delay	11.7		
Intersection Capacity Utilization	71.3%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	99	191	27	565	486	38	62	912	228	24	1129	143
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)	108	208	29	614	528	41	67	991	248	26	1227	155

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	108	237	614	570	1307	1409
Volume Left (vph)	108	0	614	0	67	26
Volume Right (vph)	0	29	0	41	248	155
Hadj (s)	0.53	-0.05	0.53	-0.02	-0.07	-0.03
Departure Headway (s)	10.2	9.6	9.6	9.1	8.8	8.8
Degree Utilization, x	0.30	0.63	1.64	1.43	3.19	3.45
Capacity (veh/h)	349	366	386	408	413	412
Control Delay (s)	16.4	26.6	322.0	232.6	1009.2	1128.3
Approach Delay (s)	23.4		279.0		1009.2	1128.3
Approach LOS	C		F		F	F

Intersection Summary			
Delay	765.0		
HCM Level of Service	F		
Intersection Capacity Utilization	149.6%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	103	112	26	193	516	87	57	532	139	70	626	388
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	117	127	30	219	586	99	65	605	158	80	711	441

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	274	905	827	1232
Volume Left (vph)	117	219	65	80
Volume Right (vph)	30	99	158	441
Hadj (s)	0.05	0.02	-0.06	-0.17
Departure Headway (s)	9.6	8.9	8.8	8.7
Degree Utilization, x	0.73	2.23	2.02	2.98
Capacity (veh/h)	368	411	415	426
Control Delay (s)	34.8	582.8	489.6	915.3
Approach Delay (s)	34.8	582.8	489.6	915.3
Approach LOS	D	F	F	F

Intersection Summary			
Delay	639.1		
HCM Level of Service	F		
Intersection Capacity Utilization	130.4%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	16	27	5	10	57	9
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	29	5	11	62	10
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			47		54	32
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			47		54	32
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		93	99
cM capacity (veh/h)			1561		951	1042

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	47	16	72
Volume Left	0	5	62
Volume Right	29	0	10
cSH	1700	1561	962
Volume to Capacity	0.03	0.00	0.07
Queue Length 95th (ft)	0	0	6
Control Delay (s)	0.0	2.5	9.0
Lane LOS		A	A
Approach Delay (s)	0.0	2.5	9.0
Approach LOS			A

Intersection Summary			
Average Delay	5.1		
Intersection Capacity Utilization	15.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	47	397	988	2	4	101
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	51	432	1074	2	4	110
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1076				1609	1075
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1076				1609	1075
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	92				96	59
cM capacity (veh/h)	648				106	267

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	483	1076	114
Volume Left	51	0	4
Volume Right	0	2	110
cSH	648	1700	252
Volume to Capacity	0.08	0.63	0.45
Queue Length 95th (ft)	6	0	55
Control Delay (s)	2.2	0.0	30.5
Lane LOS	A		D
Approach Delay (s)	2.2	0.0	30.5
Approach LOS			D

Intersection Summary			
Average Delay	2.7		
Intersection Capacity Utilization	73.4%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	31	10	1506	11	5	1238
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	34	11	1637	12	5	1346
Pedestrians	10		10			10
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	1		1			1
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	3019	1663			1659	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	3019	1663			1659	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	91			99	
cM capacity (veh/h)	14	118			385	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	45	1649	1351
Volume Left	34	0	5
Volume Right	11	12	0
cSH	18	1700	385
Volume to Capacity	2.47	0.97	0.01
Queue Length 95th (ft)	152	0	1
Control Delay (s)	1111.2	0.0	1.0
Lane LOS	F		A
Approach Delay (s)	1111.2	0.0	1.0
Approach LOS	F		

Intersection Summary			
Average Delay	16.7		
Intersection Capacity Utilization	92.8%	ICU Level of Service	F
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	7	10	6	6	8	8	2	993	18	10	807	2
Sign Control		Stop			Stop			Free			Free	
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)	8	11	7	7	9	9	2	1079	20	11	877	2
Pedestrians		10			10			10			10	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2027	2023	898	2025	2015	1109	889			1109		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2027	2023	898	2025	2015	1109	889			1109		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	78	81	98	81	85	97	100			98		
cM capacity (veh/h)	35	56	332	34	56	251	756			624		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	25	24	1101	890
Volume Left	8	7	2	11
Volume Right	7	9	20	2
cSH	58	63	756	624
Volume to Capacity	0.43	0.38	0.00	0.02
Queue Length 95th (ft)	41	36	0	1
Control Delay (s)	108.5	93.6	0.1	0.5
Lane LOS	F	F	A	A
Approach Delay (s)	108.5	93.6	0.1	0.5
Approach LOS	F	F		

Intersection Summary			
Average Delay	2.7		
Intersection Capacity Utilization	67.4%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	351	525	104	368	305	49	24	1117	246	25	1059	185
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)	382	571	113	400	332	53	26	1214	267	27	1151	201

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	382	684	400	385	1508	1379
Volume Left (vph)	382	0	400	0	26	27
Volume Right (vph)	0	113	0	53	267	201
Hadj (s)	0.53	-0.08	0.53	-0.06	-0.07	-0.05
Departure Headway (s)	10.2	9.6	10.2	9.6	9.5	9.5
Degree Utilization, x	1.08	1.82	1.13	1.03	3.98	3.65
Capacity (veh/h)	360	380	365	385	384	382
Control Delay (s)	102.8	400.5	120.0	84.2	1364.5	1216.1
Approach Delay (s)	293.9		102.4		1364.5	1216.1
Approach LOS	F		F		F	F

Intersection Summary			
Delay	871.4		
HCM Level of Service	F		
Intersection Capacity Utilization	150.9%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	280	465	8	98	331	47	18	686	139	42	604	173
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	318	528	9	111	376	53	20	780	158	48	686	197

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	856	541	958	931
Volume Left (vph)	318	111	20	48
Volume Right (vph)	9	53	158	197
Hadj (s)	0.10	0.02	-0.06	-0.08
Departure Headway (s)	9.7	9.6	9.5	9.5
Degree Utilization, x	2.30	1.44	2.53	2.45
Capacity (veh/h)	380	386	388	388
Control Delay (s)	613.2	237.9	715.9	681.2
Approach Delay (s)	613.2	237.9	715.9	681.2
Approach LOS	F	F	F	F

Intersection Summary			
Delay	600.6		
HCM Level of Service	F		
Intersection Capacity Utilization	140.7%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	18	2	0	16	25	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	2	0	17	27	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			22		38	21
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			22		38	21
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		97	99
cM capacity (veh/h)			1594		974	1057

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	22	17	33
Volume Left	0	0	27
Volume Right	2	0	5
cSH	1700	1594	987
Volume to Capacity	0.01	0.00	0.03
Queue Length 95th (ft)	0	0	3
Control Delay (s)	0.0	0.0	8.8
Lane LOS			A
Approach Delay (s)	0.0	0.0	8.8
Approach LOS			A

Intersection Summary			
Average Delay	4.0		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	4	793	673	0	2	49
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	862	732	0	2	53
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	732				1602	732
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	732				1602	732
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				98	87
cM capacity (veh/h)	873				116	421

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	866	732	55
Volume Left	4	0	2
Volume Right	0	0	53
cSH	873	1700	382
Volume to Capacity	0.00	0.43	0.15
Queue Length 95th (ft)	0	0	13
Control Delay (s)	0.1	0.0	16.0
Lane LOS	A		C
Approach Delay (s)	0.1	0.0	16.0
Approach LOS			C

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	54.9%	ICU Level of Service	A
Analysis Period (min)	15		

Long-Term (Year 2035) With-Project Conditions
(With McKinley Avenue Realignment)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	44	55	221	283	299	123	252	739	147	33	826	98
Sign Control		Stop			Stop			Free			Free	
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)	48	60	240	308	325	134	274	803	160	36	898	107
Pedestrians					10			10			10	
Lane Width (ft)					12.0			12.0			12.0	
Walking Speed (ft/s)					4.0			4.0			4.0	
Percent Blockage					1			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2680	2544	961	2691	2517	903	1004			973		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2680	2544	961	2691	2517	903	1004			973		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	0	22	0	0	60	60			95		
cM capacity (veh/h)	0	15	308	0	16	330	690			703		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	48	300	308	459	274	963	36	1004
Volume Left	48	0	308	0	274	0	36	0
Volume Right	0	240	0	134	0	160	0	107
cSH	0	64	0	22	690	1700	703	1700
Volume to Capacity	Err	4.69	Err	20.82	0.40	0.57	0.05	0.59
Queue Length 95th (ft)	Err	Err	Err	Err	48	0	4	0
Control Delay (s)	Err	Err	Err	Err	13.6	0.0	10.4	0.0
Lane LOS	F	F	F	F	B		B	
Approach Delay (s)	Err		Err		3.0		0.4	
Approach LOS	F		F					

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	108.9%	ICU Level of Service	G
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	29	132	33	153	366	109	130	555	36	41	898	148
Sign Control		Stop			Stop			Free			Free	
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)	32	143	36	166	398	118	141	603	39	45	976	161
Pedestrians		10			10			10			10	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2388	2091	1077	2179	2152	643	1147			652		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2388	2091	1077	2179	2152	643	1147			652		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	0	86	0	0	75	77			95		
cM capacity (veh/h)	0	38	262	0	34	466	604			926		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	211	683	784	1182
Volume Left	32	166	141	45
Volume Right	36	118	39	161
cSH	0	0	604	926
Volume to Capacity	Err	Err	0.23	0.05
Queue Length 95th (ft)	Err	Err	23	4
Control Delay (s)	Err	Err	6.2	1.6
Lane LOS	F	F	A	A
Approach Delay (s)	Err	Err	6.2	1.6
Approach LOS	F	F		

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	145.0%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	98	191	27	565	486	38	62	912	228	24	1129	140
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)	107	208	29	614	528	41	67	991	248	26	1227	152

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	107	237	614	570	1307	1405
Volume Left (vph)	107	0	614	0	67	26
Volume Right (vph)	0	29	0	41	248	152
Hadj (s)	0.53	-0.05	0.53	-0.02	-0.07	-0.03
Departure Headway (s)	10.2	9.6	9.6	9.1	8.8	8.8
Degree Utilization, x	0.30	0.63	1.64	1.43	3.19	3.45
Capacity (veh/h)	349	366	386	408	413	412
Control Delay (s)	16.3	26.6	321.8	232.4	1008.8	1124.4
Approach Delay (s)	23.4		278.8		1008.8	1124.4
Approach LOS	C		F		F	F

Intersection Summary			
Delay	763.5		
HCM Level of Service	F		
Intersection Capacity Utilization	149.6%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			✥			✥	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	103	112	26	193	516	87	57	532	139	70	626	388
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	117	127	30	219	586	99	65	605	158	80	711	441

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	274	905	827	1232
Volume Left (vph)	117	219	65	80
Volume Right (vph)	30	99	158	441
Hadj (s)	0.05	0.02	-0.06	-0.17
Departure Headway (s)	9.6	8.9	8.8	8.7
Degree Utilization, x	0.73	2.23	2.02	2.98
Capacity (veh/h)	368	411	415	426
Control Delay (s)	34.8	582.8	489.6	915.3
Approach Delay (s)	34.8	582.8	489.6	915.3
Approach LOS	D	F	F	F

Intersection Summary			
Delay	639.1		
HCM Level of Service	F		
Intersection Capacity Utilization	130.4%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	207	27	5	639	57	9
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	225	29	5	695	62	10
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			254		945	240
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			254		945	240
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		79	99
cM capacity (veh/h)			1311		289	799

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	254	700	72
Volume Left	0	5	62
Volume Right	29	0	10
cSH	1700	1311	317
Volume to Capacity	0.15	0.00	0.23
Queue Length 95th (ft)	0	0	21
Control Delay (s)	0.0	0.1	19.7
Lane LOS		A	C
Approach Delay (s)	0.0	0.1	19.7
Approach LOS			C

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	48.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	47	397	988	2	4	101
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	51	432	1074	2	4	110
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1076				1609	1075
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1076				1609	1075
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	92				96	59
cM capacity (veh/h)	648				106	267

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	483	1076	114
Volume Left	51	0	4
Volume Right	0	2	110
cSH	648	1700	252
Volume to Capacity	0.08	0.63	0.45
Queue Length 95th (ft)	6	0	55
Control Delay (s)	2.2	0.0	30.5
Lane LOS	A		D
Approach Delay (s)	2.2	0.0	30.5
Approach LOS			D

Intersection Summary			
Average Delay	2.7		
Intersection Capacity Utilization	73.4%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	104	254	241	211	133	60	326	908	283	105	801	81
Sign Control		Stop			Stop			Free			Free	
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)	113	276	262	229	145	65	354	987	308	114	871	88
Pedestrians					10			10			10	
Lane Width (ft)					12.0			12.0			12.0	
Walking Speed (ft/s)					4.0			4.0			4.0	
Percent Blockage					1			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2986	3156	925	3368	3046	1161	959			1305		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2986	3156	925	3368	3046	1161	959			1305		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	0	19	0	0	72	51			78		
cM capacity (veh/h)	0	4	324	0	5	234	717			526		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	113	538	229	210	354	1295	114	959
Volume Left	113	0	229	0	354	0	114	0
Volume Right	0	262	0	65	0	308	0	88
cSH	0	8	0	7	717	1700	526	1700
Volume to Capacity	Err	66.41	Err	29.34	0.49	0.76	0.22	0.56
Queue Length 95th (ft)	Err	Err	Err	Err	69	0	20	0
Control Delay (s)	Err	Err	Err	Err	14.8	0.0	13.7	0.0
Lane LOS	F	F	F	F	B		B	
Approach Delay (s)	Err		Err		3.2		1.5	
Approach LOS	F		F					

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	124.2%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	90	481	100	100	241	81	71	818	124	130	643	41
Sign Control		Stop			Stop			Free			Free	
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)	98	523	109	109	262	88	77	889	135	141	699	45
Pedestrians		10			10			10			10	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2354	2202	741	2505	2157	977	753			1034		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2354	2202	741	2505	2157	977	753			1034		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	0	73	0	0	71	91			79		
cM capacity (veh/h)	0	31	409	0	34	299	849			667		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	729	459	1101	885
Volume Left	98	109	77	141
Volume Right	109	88	135	45
cSH	0	0	849	667
Volume to Capacity	Err	Err	0.09	0.21
Queue Length 95th (ft)	Err	Err	7	20
Control Delay (s)	Err	Err	2.7	5.6
Lane LOS	F	F	A	A
Approach Delay (s)	Err	Err	2.7	5.6
Approach LOS	F	F		

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	125.2%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	351	525	104	368	305	49	24	1117	246	25	1059	184
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)	382	571	113	400	332	53	26	1214	267	27	1151	200

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	382	684	400	385	1508	1378
Volume Left (vph)	382	0	400	0	26	27
Volume Right (vph)	0	113	0	53	267	200
Hadj (s)	0.53	-0.08	0.53	-0.06	-0.07	-0.05
Departure Headway (s)	10.2	9.6	10.2	9.6	9.5	9.5
Degree Utilization, x	1.08	1.82	1.13	1.03	3.98	3.64
Capacity (veh/h)	360	380	365	385	384	382
Control Delay (s)	102.8	400.5	120.0	84.2	1364.5	1214.8
Approach Delay (s)	293.9		102.4		1364.5	1214.8
Approach LOS	F		F		F	F

Intersection Summary			
Delay	871.0		
HCM Level of Service	F		
Intersection Capacity Utilization	150.9%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	280	465	8	98	331	47	18	686	139	42	604	173
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)	304	505	9	107	360	51	20	746	151	46	657	188

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	818	517	916	890
Volume Left (vph)	304	107	20	46
Volume Right (vph)	9	51	151	188
Hadj (s)	0.10	0.02	-0.06	-0.08
Departure Headway (s)	9.7	9.6	9.5	9.5
Degree Utilization, x	2.20	1.38	2.42	2.34
Capacity (veh/h)	379	385	387	388
Control Delay (s)	568.8	212.0	666.9	633.7
Approach Delay (s)	568.8	212.0	666.9	633.7
Approach LOS	F	F	F	F

Intersection Summary			
Delay	557.0		
HCM Level of Service	F		
Intersection Capacity Utilization	140.7%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	640	2	0	353	25	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	696	2	0	384	27	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			698		1080	697
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			698		1080	697
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		89	99
cM capacity (veh/h)			899		241	441

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	698	384	33
Volume Left	0	0	27
Volume Right	2	0	5
cSH	1700	899	261
Volume to Capacity	0.41	0.00	0.12
Queue Length 95th (ft)	0	0	11
Control Delay (s)	0.0	0.0	20.8
Lane LOS			C
Approach Delay (s)	0.0	0.0	20.8
Approach LOS			C

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	43.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	4	793	673	0	2	49
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	862	732	0	2	53
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	732				1602	732
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	732				1602	732
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				98	87
cM capacity (veh/h)	873				116	421

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	866	732	55
Volume Left	4	0	2
Volume Right	0	0	53
cSH	873	1700	382
Volume to Capacity	0.00	0.43	0.15
Queue Length 95th (ft)	0	0	13
Control Delay (s)	0.1	0.0	16.0
Lane LOS	A		C
Approach Delay (s)	0.1	0.0	16.0
Approach LOS			C

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	54.9%	ICU Level of Service	A
Analysis Period (min)	15		

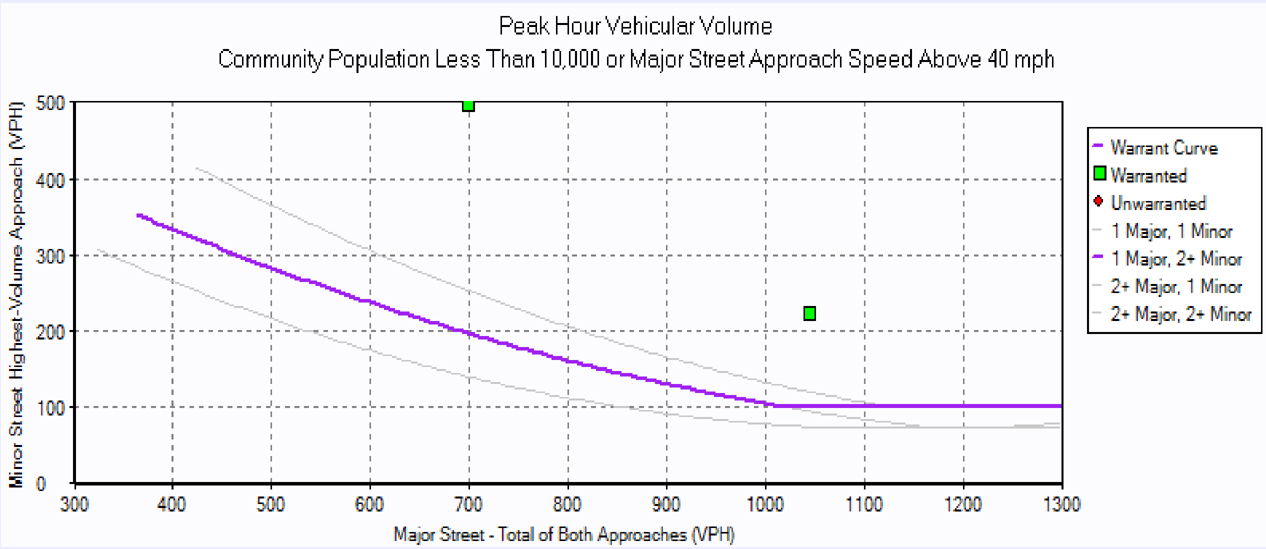
APPENDIX I

PROJECT PEAK-HOUR TRAFFIC SIGNAL WARRANTS

Warrant 3: Peak Hour

3: Fowler Ave & Olive Ave

Warrant 3

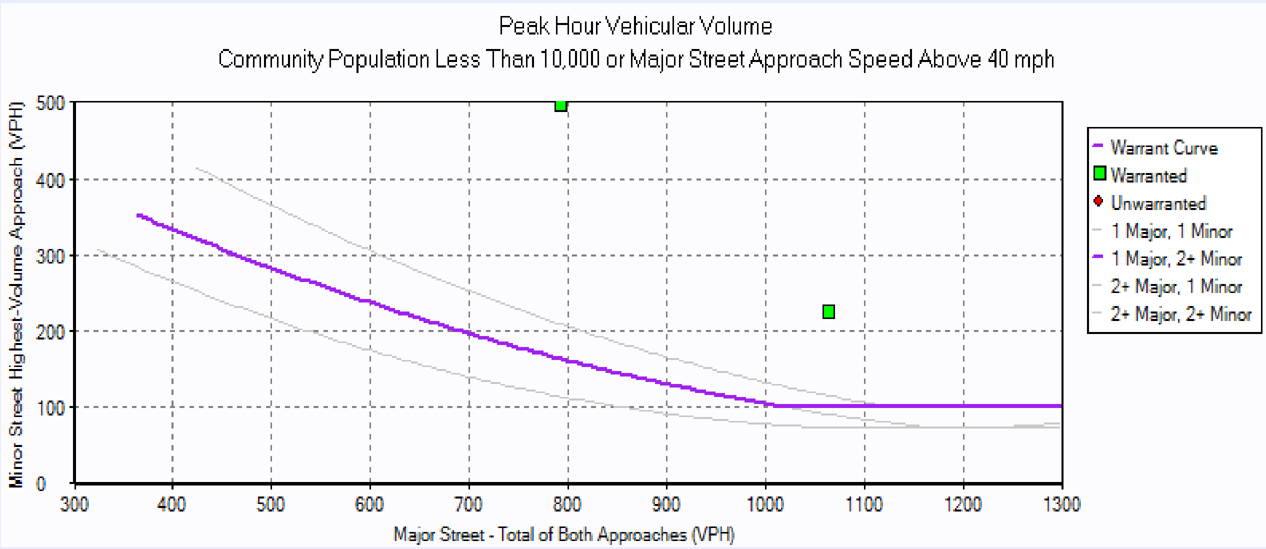


Note: Please turn over for volume information.

Warrant 3: Peak Hour

3: Fowler Ave & Olive Ave

Warrant 3

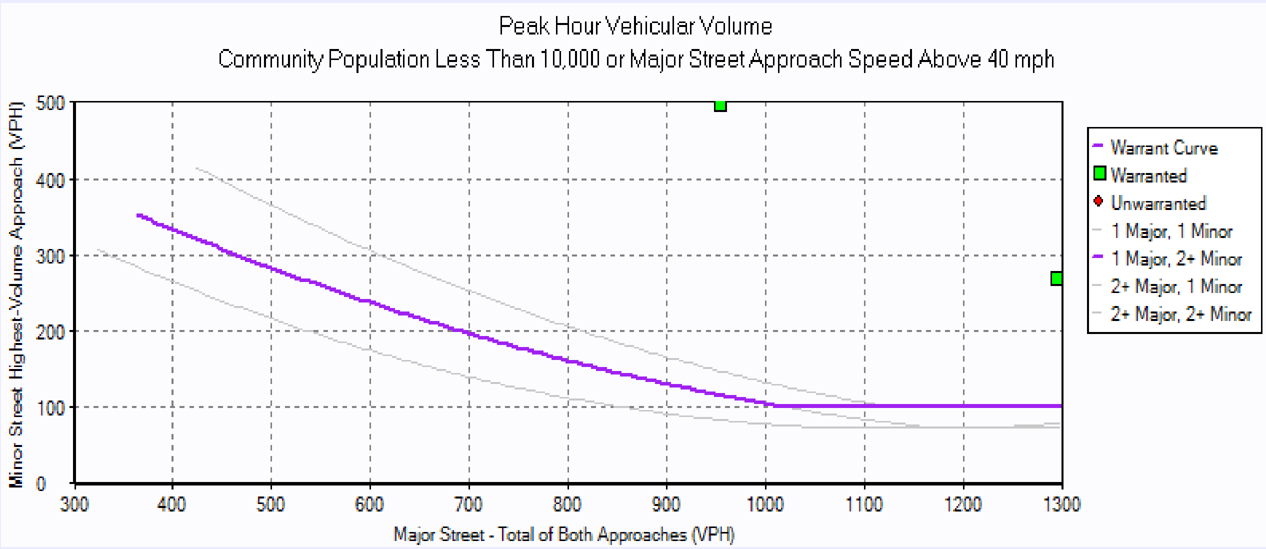


Note: Please turn over for volume information.

Warrant 3: Peak Hour

3: Fowler Ave & Olive Ave

Warrant 3



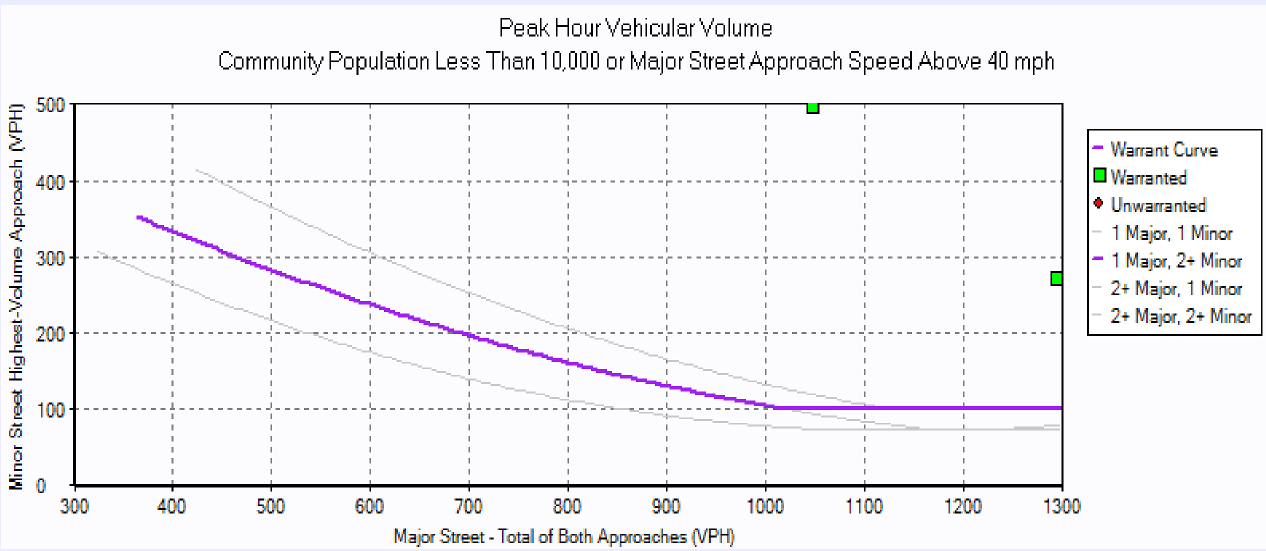
Note: Please turn over for volume information.

Warrant 3: Peak Hour

Near-Term Plus Project

3: Fowler Ave & Olive Ave

Warrant 3

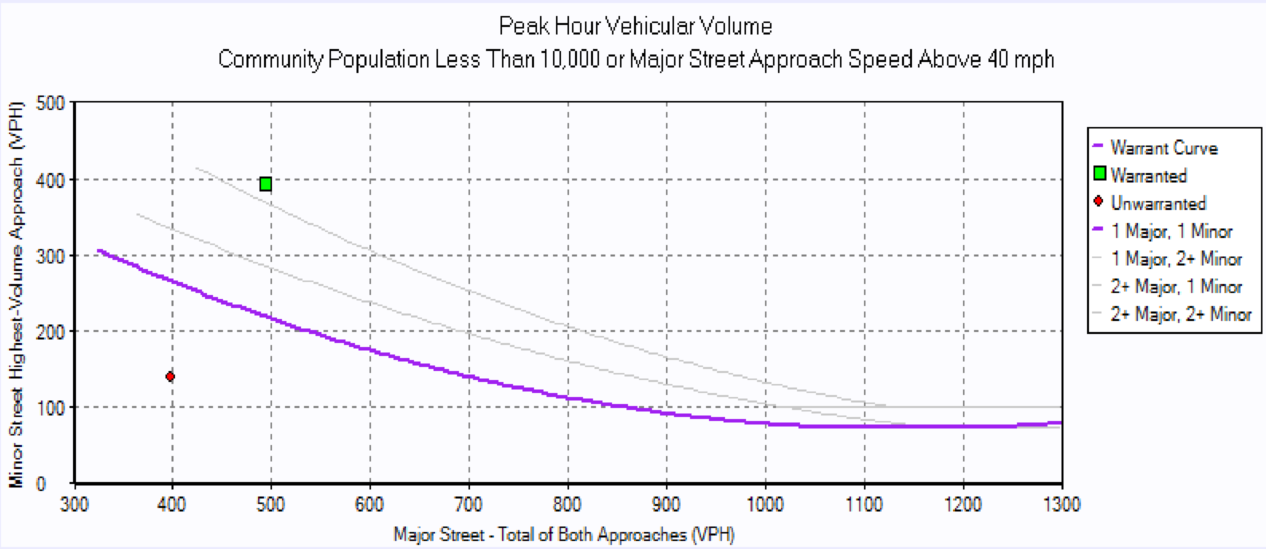


Note: Please turn over for volume information.

Warrant 3: Peak Hour

4: Armstrong Ave & Olive Ave

Warrant 3

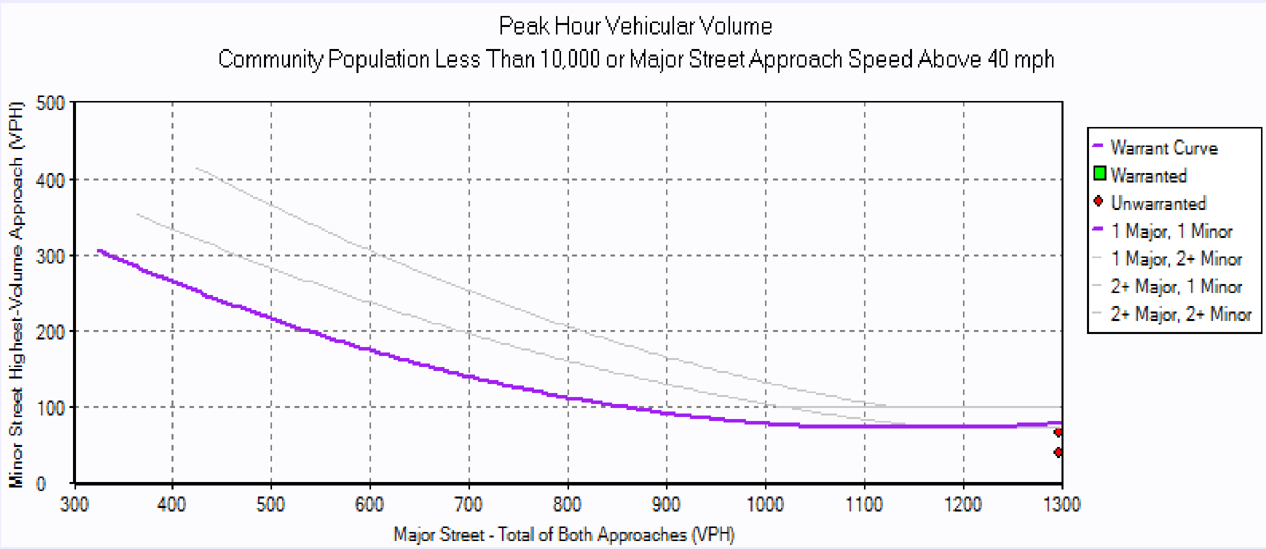


Note: Please turn over for volume information.

Warrant 3: Peak Hour

1: Fowler Ave & Floradora Ave

Warrant 3

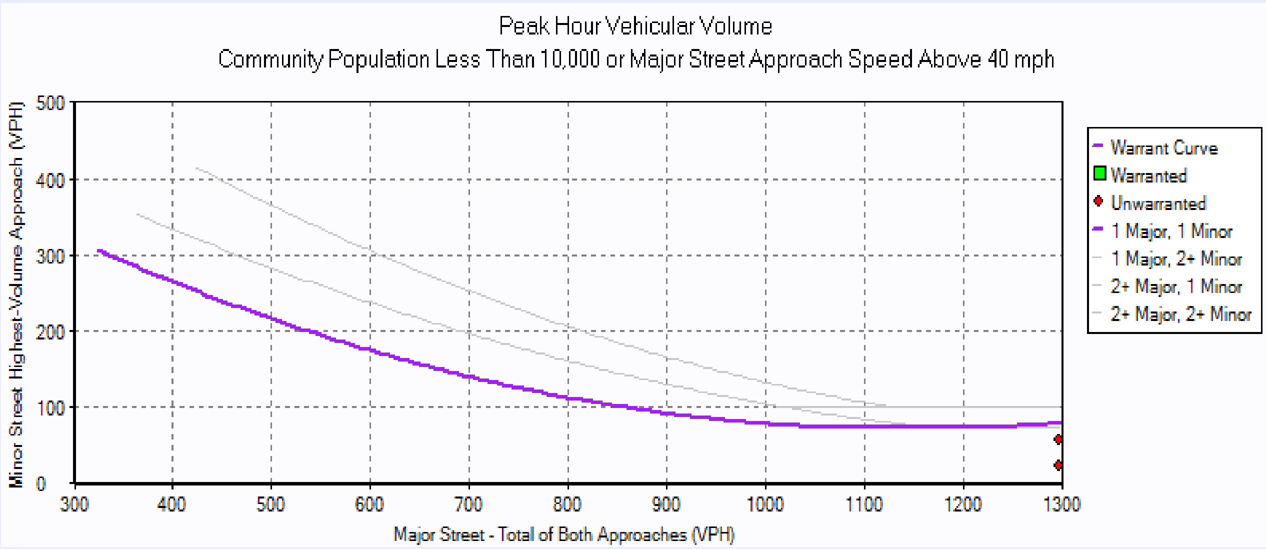


Note: Please turn over for volume information.

Warrant 3: Peak Hour

2: Armstrong Ave & Floradora Ave

Warrant 3

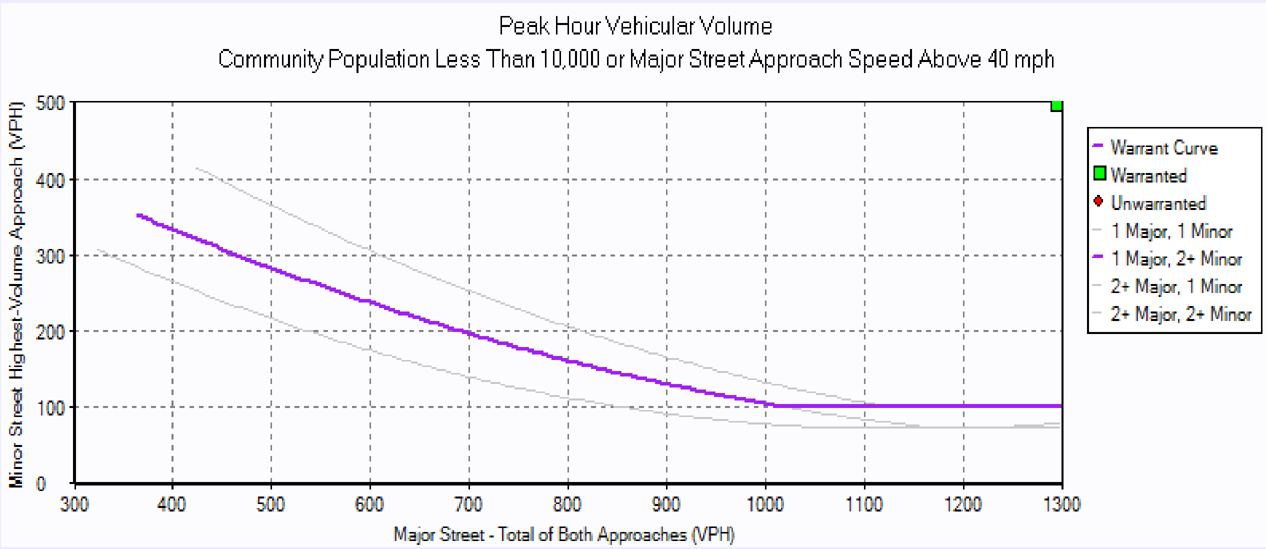


Note: Please turn over for volume information.

Warrant 3: Peak Hour

3: Fowler Ave & Olive Ave

Warrant 3

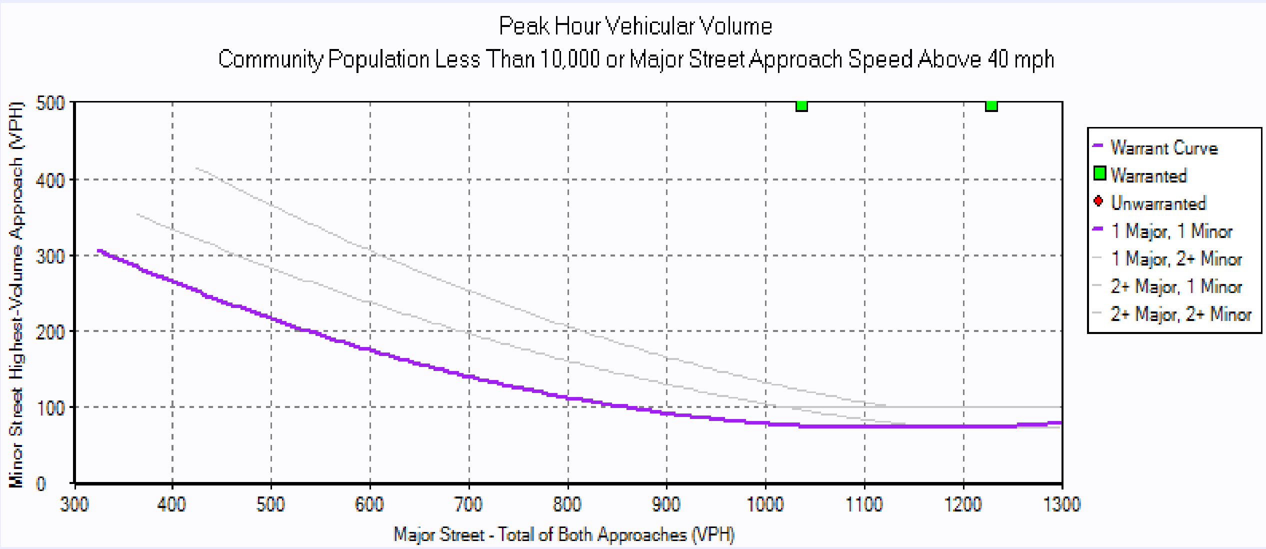


Note: Please turn over for volume information.

Warrant 3: Peak Hour

4: Armstrong Ave & Olive Ave

Warrant 3

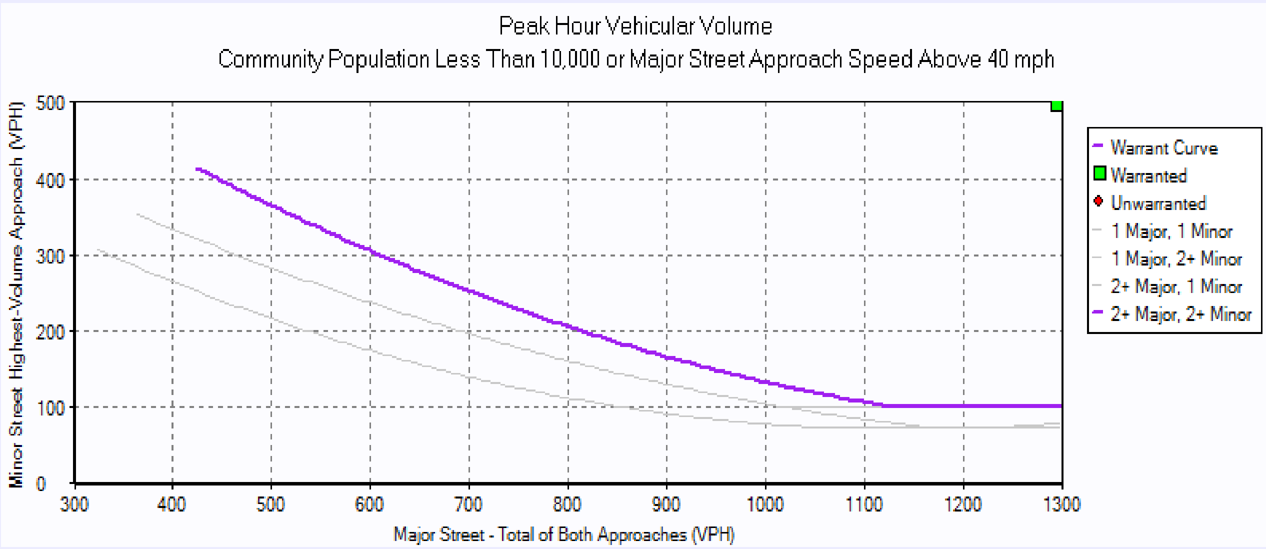


Note: Please turn over for volume information.

Warrant 3: Peak Hour

1: Fowler Ave & Floradora / McKinley

Warrant 3

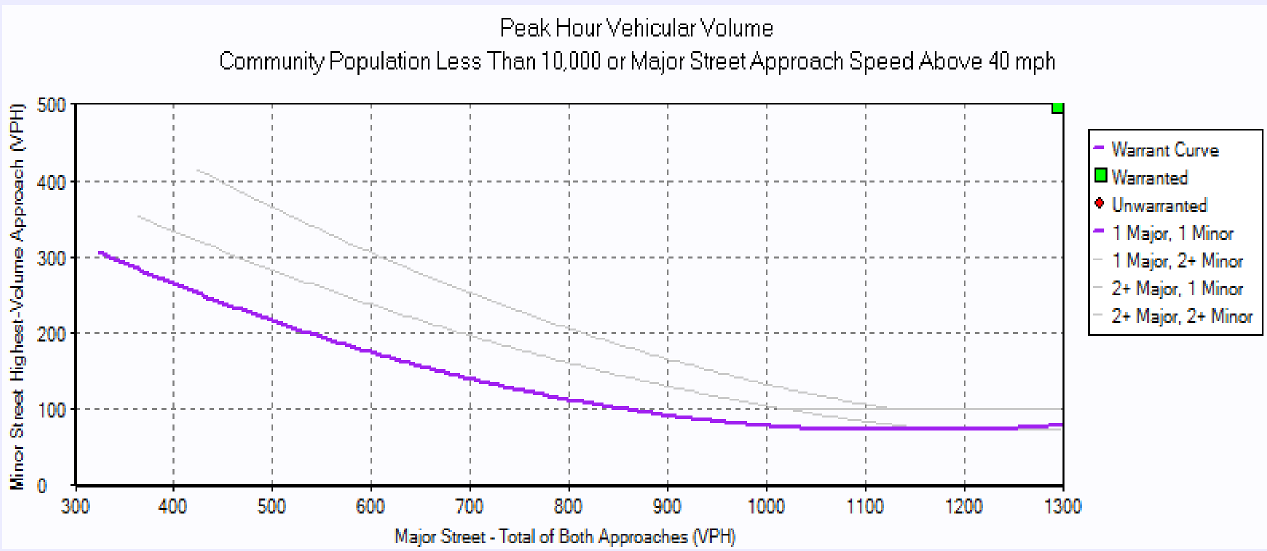


Note: Please turn over for volume information.

Warrant 3: Peak Hour

2: Armstrong Ave & Floradora / McKinley

Warrant 3



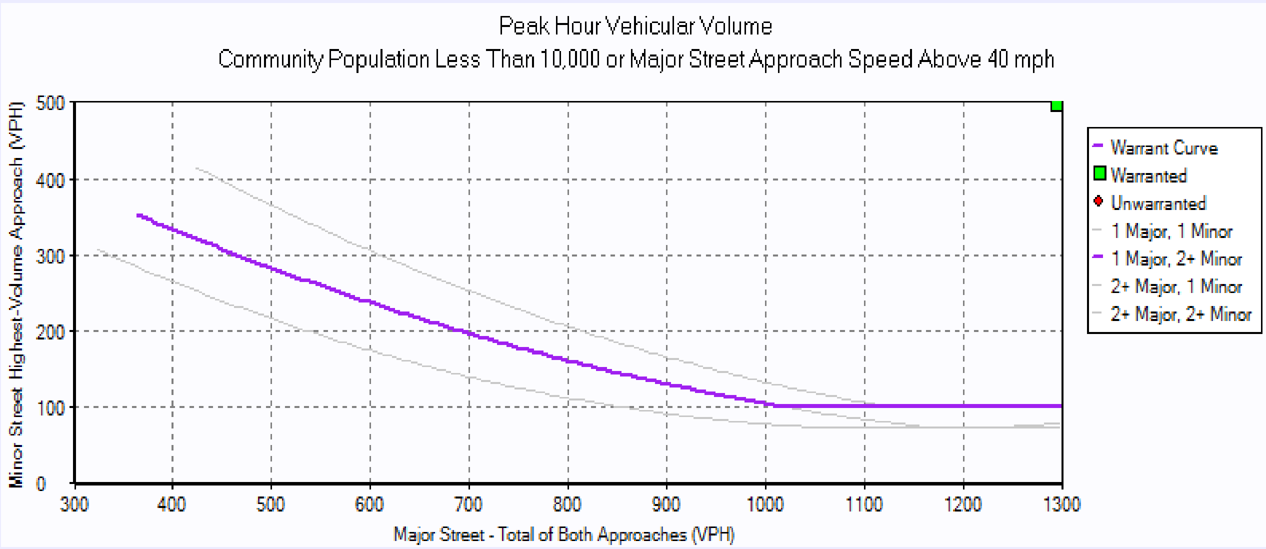
Note: Please turn over for volume information.

Warrant 3: Peak Hour

2035 Plus Project With McKinley Realignment

3: Fowler Ave & Olive Ave

Warrant 3

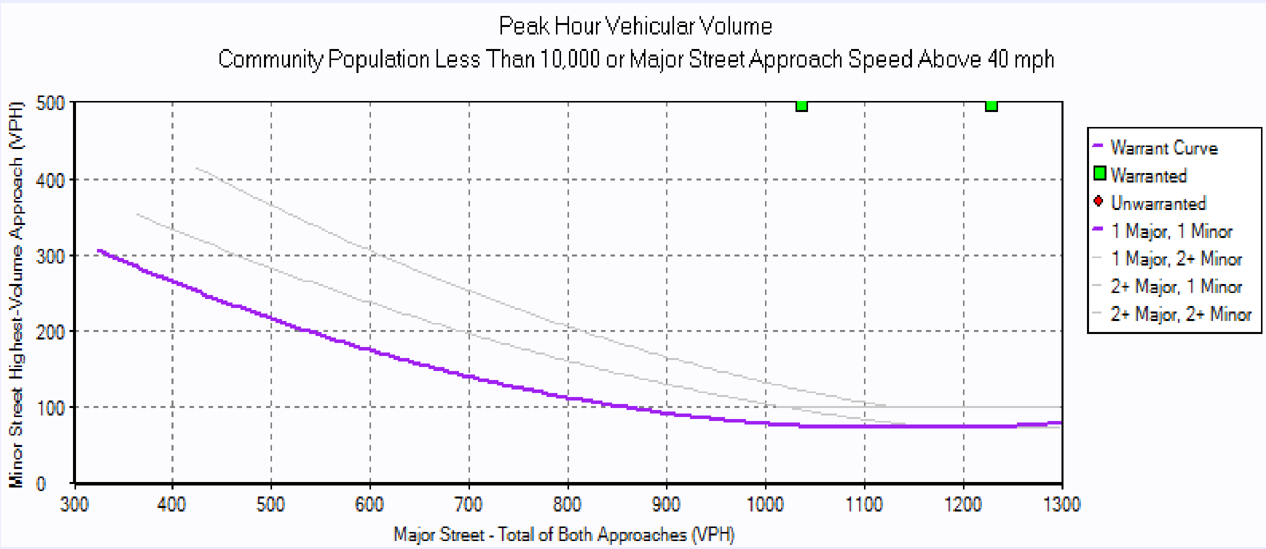


Note: Please turn over for volume information.

Warrant 3: Peak Hour

4: Armstrong Ave & Olive Ave

Warrant 3



Note: Please turn over for volume information.

APPENDIX J

MITIGATED INTERSECTION ANALYSIS SHEETS

Existing Plus Project Phases 1 and 2 Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	28	51	15	462	163	16	17	307	96	3	350	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.9		4.0	4.9		4.0	4.9		4.0	4.9	
Lane Util. Factor	1.00	1.00		0.97	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.99	1.00	
Frt	1.00	0.97		1.00	0.99		1.00	0.96		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	1790		3433	1832		1770	1781		1756	1843	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1790		3433	1832		1770	1781		1756	1843	
Peak-hour factor, PHF	0.90	0.90	0.90	0.83	0.83	0.83	0.88	0.88	0.88	0.92	0.92	0.92
Adj. Flow (vph)	31	57	17	557	196	19	19	349	109	3	380	23
RTOR Reduction (vph)	0	12	0	0	3	0	0	11	0	0	2	0
Lane Group Flow (vph)	31	62	0	557	212	0	19	447	0	3	401	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	2.3	9.1		16.8	23.6		2.1	23.6		0.8	22.3	
Effective Green, g (s)	2.3	9.1		16.8	23.6		2.1	23.6		0.8	22.3	
Actuated g/C Ratio	0.03	0.13		0.25	0.35		0.03	0.35		0.01	0.33	
Clearance Time (s)	4.0	4.9		4.0	4.9		4.0	4.9		4.0	4.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	60	239		847	635		55	617		21	604	
v/s Ratio Prot	0.02	0.03		c0.16	c0.12		c0.01	c0.25		0.00	0.22	
v/s Ratio Perm												
v/c Ratio	0.52	0.26		0.66	0.33		0.35	0.72		0.14	0.66	
Uniform Delay, d1	32.4	26.5		23.1	16.4		32.3	19.4		33.3	19.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	7.3	0.6		1.9	0.3		3.8	4.2		3.1	2.8	
Delay (s)	39.7	27.1		24.9	16.8		36.1	23.6		36.4	22.4	
Level of Service	D	C		C	B		D	C		D	C	
Approach Delay (s)		30.8			22.6			24.1			22.5	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	23.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	68.1	Sum of lost time (s)	8.0
Intersection Capacity Utilization	53.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	31	74	557	215	19	458	3	403
v/c Ratio	0.15	0.25	0.61	0.31	0.09	0.68	0.02	0.64
Control Delay	37.0	26.8	28.7	19.6	37.4	24.6	38.7	26.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.0	26.8	28.7	19.6	37.4	24.6	38.7	26.4
Queue Length 50th (ft)	10	19	86	40	6	132	1	114
Queue Length 95th (ft)	48	70	#219	149	34	350	11	322
Internal Link Dist (ft)		2070		1235		1413		1259
Turn Bay Length (ft)	215		250		250		250	
Base Capacity (vph)	263	743	1212	1088	263	1077	263	1093
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.10	0.46	0.20	0.07	0.43	0.01	0.37

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	75	106	43	136	65	9	10	456	96	5	445	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.9		4.0	4.9		4.0	4.9		4.0	4.9	
Lane Util. Factor	1.00	1.00		0.97	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.99	1.00	
Frt	1.00	0.96		1.00	0.98		1.00	0.97		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)	1752	1754		3400	1803		1752	1786		1742	1808	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1752	1754		3400	1803		1752	1786		1742	1808	
Peak-hour factor, PHF	0.90	0.90	0.90	0.83	0.83	0.83	0.88	0.88	0.88	0.92	0.92	0.92
Adj. Flow (vph)	83	118	48	164	78	11	11	518	109	5	484	58
RTOR Reduction (vph)	0	15	0	0	5	0	0	8	0	0	5	0
Lane Group Flow (vph)	83	151	0	164	84	0	11	619	0	5	537	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	6.1	13.4		8.1	15.4		1.0	27.7		0.9	27.6	
Effective Green, g (s)	6.1	13.4		8.1	15.4		1.0	27.7		0.9	27.6	
Actuated g/C Ratio	0.09	0.20		0.12	0.23		0.01	0.41		0.01	0.41	
Clearance Time (s)	4.0	4.9		4.0	4.9		4.0	4.9		4.0	4.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	157	346		406	409		26	729		23	735	
v/s Ratio Prot	c0.05	c0.09		0.05	0.05		c0.01	c0.35		0.00	0.30	
v/s Ratio Perm												
v/c Ratio	0.53	0.44		0.40	0.20		0.42	0.85		0.22	0.73	
Uniform Delay, d1	29.5	23.9		27.7	21.3		33.2	18.2		33.2	17.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.2	0.9		0.7	0.2		10.7	9.1		4.7	3.8	
Delay (s)	32.7	24.8		28.3	21.5		43.9	27.3		37.9	20.8	
Level of Service	C	C		C	C		D	C		D	C	
Approach Delay (s)		27.4			25.9			27.6			20.9	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	25.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	67.9	Sum of lost time (s)	12.9
Intersection Capacity Utilization	56.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	83	166	164	89	11	627	5	542
v/c Ratio	0.38	0.48	0.38	0.20	0.06	0.81	0.03	0.70
Control Delay	38.5	28.4	34.3	25.3	36.1	25.9	36.4	21.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.5	28.4	34.3	25.3	36.1	25.9	36.4	21.1
Queue Length 50th (ft)	28	47	28	25	4	176	2	143
Queue Length 95th (ft)	#113	143	79	78	24	447	15	382
Internal Link Dist (ft)		2070		1225		1413		1259
Turn Bay Length (ft)	215		250		250		250	
Base Capacity (vph)	236	665	459	675	236	1320	236	1334
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.25	0.36	0.13	0.05	0.47	0.02	0.41

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Near-Term With-Project Phases 1 and 2 Conditions

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	1	4	452	1	2	480
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.91	0.91	0.94	0.94
Hourly flow rate (vph)	1	5	497	1	2	511
Pedestrians	10		10			10
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	1		1			1
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1032	517			508	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1032	517			508	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	99			100	
cM capacity (veh/h)	253	549			1048	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	6	498	513
Volume Left	1	0	2
Volume Right	5	1	0
cSH	445	1700	1048
Volume to Capacity	0.01	0.29	0.00
Queue Length 95th (ft)	1	0	0
Control Delay (s)	13.2	0.0	0.1
Lane LOS	B		A
Approach Delay (s)	13.2	0.0	0.1
Approach LOS	B		

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	39.7%	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 (veh/h)	2	2	4	16	9	4	3	109	2	2	380	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.66	0.66	0.66	0.71	0.71	0.71
Hourly flow rate (vph)	2	2	5	18	10	5	5	165	3	3	535	1
Pedestrians		10			10			10			10	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	747	739	556	743	738	187	547			178		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	747	739	556	743	738	187	547			178		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	99	99	94	97	99	100			100		
cM capacity (veh/h)	309	337	522	316	338	841	1014			1386		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	9	33	173	539
Volume Left	2	18	5	3
Volume Right	5	5	3	1
cSH	399	353	1014	1386
Volume to Capacity	0.02	0.09	0.00	0.00
Queue Length 95th (ft)	2	8	0	0
Control Delay (s)	14.2	16.2	0.3	0.1
Lane LOS	B	C	A	A
Approach Delay (s)	14.2	16.2	0.3	0.1
Approach LOS	B	C		

Intersection Summary			
Average Delay	1.0		
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												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	27	54	37	395	158	16	32	404	67	15	421	16
Peak Hour Factor	0.90	0.90	0.90	0.83	0.83	0.83	0.88	0.88	0.88	0.92	0.92	0.92
Hourly flow rate (vph)	30	60	41	476	190	19	36	459	76	16	458	17

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	30	101	476	210	572	491
Volume Left (vph)	30	0	476	0	36	16
Volume Right (vph)	0	41	0	19	76	17
Hadj (s)	0.53	-0.25	0.53	-0.03	-0.03	0.02
Departure Headway (s)	10.2	9.4	8.8	8.2	7.7	7.8
Degree Utilization, x	0.08	0.26	1.16	0.48	1.23	1.06
Capacity (veh/h)	349	379	405	435	473	470
Control Delay (s)	12.9	14.5	123.0	17.3	144.6	87.1
Approach Delay (s)	14.1		90.7		144.6	87.1
Approach LOS	B		F		F	F

Intersection Summary			
Delay	100.8		
HCM Level of Service	F		
Intersection Capacity Utilization	74.5%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	31	95	10	35	303	14	37	73	46	26	123	242
Peak Hour Factor	0.77	0.77	0.77	0.83	0.83	0.83	0.72	0.72	0.72	0.76	0.76	0.76
Hourly flow rate (vph)	40	123	13	42	365	17	51	101	64	34	162	318

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	177	424	217	514
Volume Left (vph)	40	42	51	34
Volume Right (vph)	13	17	64	318
Hadj (s)	0.04	0.03	-0.10	-0.32
Departure Headway (s)	7.8	7.0	7.4	6.4
Degree Utilization, x	0.38	0.82	0.45	0.92
Capacity (veh/h)	418	424	444	545
Control Delay (s)	15.5	34.5	16.3	45.3
Approach Delay (s)	15.5	34.5	16.3	45.3
Approach LOS	C	D	C	E

Intersection Summary			
Delay	33.2		
HCM Level of Service	D		
Intersection Capacity Utilization	52.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	9	1	0	5	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	1	0	5	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			11		16	10
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			11		16	10
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1608		1003	1071

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	11	5	0
Volume Left	0	0	0
Volume Right	1	0	0
cSH	1700	1608	1700
Volume to Capacity	0.01	0.00	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	6.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	8	135	600	0	0	3
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	147	652	0	0	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	652				816	652
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	652				816	652
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				100	99
cM capacity (veh/h)	934				343	468

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	155	652	3
Volume Left	9	0	0
Volume Right	0	0	3
cSH	934	1700	468
Volume to Capacity	0.01	0.38	0.01
Queue Length 95th (ft)	1	0	1
Control Delay (s)	0.6	0.0	12.7
Lane LOS	A		B
Approach Delay (s)	0.6	0.0	12.7
Approach LOS			B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	41.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	6	3	744	5	2	669
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.91	0.91	0.88	0.88
Hourly flow rate (vph)	7	3	818	5	2	760
Pedestrians	10		10			10
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	1		1			1
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1605	840			833	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1605	840			833	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	94	99			100	
cM capacity (veh/h)	113	357			789	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	10	823	762
Volume Left	7	0	2
Volume Right	3	5	0
cSH	146	1700	789
Volume to Capacity	0.07	0.48	0.00
Queue Length 95th (ft)	6	0	0
Control Delay (s)	31.4	0.0	0.1
Lane LOS	D		A
Approach Delay (s)	31.4	0.0	0.1
Approach LOS	D		

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	52.3%	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 (veh/h)	2	5	2	3	4	4	1	209	9	5	111	1
Sign Control		Stop			Stop			Free			Free	
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)	2	5	2	3	4	4	1	227	10	5	121	1
Pedestrians		10			10			10			10	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	393	391	141	391	387	252	132			247		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	393	391	141	391	387	252	132			247		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	99	100	99	99	99	100			100		
cM capacity (veh/h)	540	531	889	542	534	771	1435			1302		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	10	12	238	127
Volume Left	2	3	1	5
Volume Right	2	4	10	1
cSH	586	604	1435	1302
Volume to Capacity	0.02	0.02	0.00	0.00
Queue Length 95th (ft)	1	2	0	0
Control Delay (s)	11.3	11.1	0.0	0.4
Lane LOS	B	B	A	A
Approach Delay (s)	11.3	11.1	0.0	0.4
Approach LOS	B	B		

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	25.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	77	113	79	113	75	13	34	651	113	14	604	53
Peak Hour Factor	0.90	0.90	0.90	0.83	0.83	0.83	0.88	0.88	0.88	0.92	0.92	0.92
Hourly flow rate (vph)	86	126	88	136	90	16	39	740	128	15	657	58

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	86	213	136	106	907	729
Volume Left (vph)	86	0	136	0	39	15
Volume Right (vph)	0	88	0	16	128	58
Hadj (s)	0.55	-0.24	0.55	-0.05	-0.03	0.01
Departure Headway (s)	9.2	8.4	9.3	8.8	7.2	7.3
Degree Utilization, x	0.22	0.50	0.35	0.26	1.82	1.47
Capacity (veh/h)	385	413	376	402	503	498
Control Delay (s)	13.5	18.2	16.2	13.6	396.7	244.3
Approach Delay (s)	16.9		15.0		396.7	244.3
Approach LOS	C		C		F	F

Intersection Summary			
Delay	251.1		
HCM Level of Service	F		
Intersection Capacity Utilization	87.0%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	95	167	1	7	115	10	5	112	22	10	45	51
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)	103	182	1	8	125	11	5	122	24	11	49	55

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	286	143	151	115
Volume Left (vph)	103	8	5	11
Volume Right (vph)	1	11	24	55
Hadj (s)	0.12	0.02	-0.04	-0.22
Departure Headway (s)	4.9	5.0	5.1	5.0
Degree Utilization, x	0.39	0.20	0.21	0.16
Capacity (veh/h)	692	664	642	647
Control Delay (s)	11.0	9.2	9.5	9.0
Approach Delay (s)	11.0	9.2	9.5	9.0
Approach LOS	B	A	A	A

Intersection Summary			
Delay	10.0		
HCM Level of Service	A		
Intersection Capacity Utilization	44.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	10	0	0	9	1	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	0	0	10	1	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			11		21	11
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			11		21	11
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1602		994	1067

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	11	10	1
Volume Left	0	0	1
Volume Right	0	0	0
cSH	1700	1602	994
Volume to Capacity	0.01	0.00	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	8.6
Lane LOS			A
Approach Delay (s)	0.0	0.0	8.6
Approach LOS			A

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	3	250	203	0	0	8
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	272	221	0	0	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	221				499	221
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	221				499	221
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	99
cM capacity (veh/h)	1343				528	816

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	275	221	9
Volume Left	3	0	0
Volume Right	0	0	9
cSH	1343	1700	816
Volume to Capacity	0.00	0.13	0.01
Queue Length 95th (ft)	0	0	1
Control Delay (s)	0.1	0.0	9.5
Lane LOS	A		A
Approach Delay (s)	0.1	0.0	9.5
Approach LOS			A

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	25.6%	ICU Level of Service	A
Analysis Period (min)	15		

Near-Term With-Project Phases 1 Through 3 Conditions

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	44	18	455	20	9	480
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.91	0.91	0.94	0.94
Hourly flow rate (vph)	50	20	500	22	10	511
Pedestrians	10		10			10
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	1		1			1
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	805	281			532	
vC1, stage 1 conf vol	521					
vC2, stage 2 conf vol	284					
vCu, unblocked vol	805	281			532	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	90	97			99	
cM capacity (veh/h)	500	704			1023	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	70	333	189	10	255	255
Volume Left	50	0	0	10	0	0
Volume Right	20	0	22	0	0	0
cSH	546	1700	1700	1023	1700	1700
Volume to Capacity	0.13	0.20	0.11	0.01	0.15	0.15
Queue Length 95th (ft)	11	0	0	1	0	0
Control Delay (s)	12.6	0.0	0.0	8.6	0.0	0.0
Lane LOS	B			A		
Approach Delay (s)	12.6	0.0		0.2		
Approach LOS	B					

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	26.5%	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)	29	59	37	478	170	19	32	421	101	15	459	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.9		4.0	4.9		4.0	4.9		4.0	4.9	
Lane Util. Factor	1.00	1.00		0.97	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	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	0.97		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	1742		3433	1831		1770	3414		1770	3511	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1742		3433	1831		1770	3414		1770	3511	
Peak-hour factor, PHF	0.90	0.90	0.90	0.83	0.83	0.83	0.88	0.88	0.88	0.92	0.92	0.92
Adj. Flow (vph)	32	66	41	576	205	23	36	478	115	16	499	23
RTOR Reduction (vph)	0	28	0	0	4	0	0	22	0	0	4	0
Lane Group Flow (vph)	32	79	0	576	224	0	36	571	0	16	518	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	2.2	9.4		16.1	23.3		2.3	17.9		1.0	16.6	
Effective Green, g (s)	2.2	9.4		16.1	23.3		2.3	17.9		1.0	16.6	
Actuated g/C Ratio	0.04	0.15		0.26	0.37		0.04	0.29		0.02	0.27	
Clearance Time (s)	4.0	4.9		4.0	4.9		4.0	4.9		4.0	4.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	63	263		889	686		65	982		28	937	
v/s Ratio Prot	0.02	0.05		c0.17	c0.12		c0.02	c0.17		0.01	0.15	
v/s Ratio Perm												
v/c Ratio	0.51	0.30		0.65	0.33		0.55	0.58		0.57	0.55	
Uniform Delay, d1	29.5	23.5		20.5	13.9		29.4	18.9		30.4	19.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	6.3	0.6		1.6	0.3		9.8	0.9		25.2	0.7	
Delay (s)	35.8	24.1		22.2	14.1		39.3	19.8		55.6	20.3	
Level of Service	D	C		C	B		D	B		E	C	
Approach Delay (s)		26.8			19.9			20.9			21.4	
Approach LOS		C			B			C			C	

Intersection Summary			
HCM Average Control Delay	21.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	62.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	54.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	32	107	576	228	36	593	16	522
v/c Ratio	0.14	0.32	0.60	0.31	0.15	0.55	0.07	0.54
Control Delay	33.5	21.7	24.8	16.0	33.4	20.4	33.8	23.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.5	21.7	24.8	16.0	33.4	20.4	33.8	23.3
Queue Length 50th (ft)	9	21	78	34	11	80	5	72
Queue Length 95th (ft)	45	76	196	131	48	204	28	190
Internal Link Dist (ft)		2070		1235		1413		1259
Turn Bay Length (ft)	215		150		250		250	
Base Capacity (vph)	293	811	1422	1182	293	1659	293	1616
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.13	0.41	0.19	0.12	0.36	0.05	0.32

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	31	97	12	35	304	15	38	74	46	27	124	242
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.9		4.0	4.9		4.0	4.9		4.0	4.9	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.99		1.00	0.94		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1824		1770	1847		1770	1732		1770	1639	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1824		1770	1847		1770	1732		1770	1639	
Peak-hour factor, PHF	0.77	0.77	0.77	0.83	0.83	0.83	0.72	0.72	0.72	0.76	0.76	0.76
Adj. Flow (vph)	40	126	16	42	366	18	53	103	64	36	163	318
RTOR Reduction (vph)	0	5	0	0	2	0	0	25	0	0	80	0
Lane Group Flow (vph)	40	137	0	42	382	0	53	142	0	36	401	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	3.5	19.6		3.5	19.6		3.6	22.2		3.4	22.0	
Effective Green, g (s)	3.5	19.6		3.5	19.6		3.6	22.2		3.4	22.0	
Actuated g/C Ratio	0.05	0.29		0.05	0.29		0.05	0.33		0.05	0.33	
Clearance Time (s)	4.0	4.9		4.0	4.9		4.0	4.9		4.0	4.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	93	538		93	544		96	578		90	542	
v/s Ratio Prot	0.02	0.08		c0.02	c0.21		c0.03	0.08		0.02	c0.24	
v/s Ratio Perm												
v/c Ratio	0.43	0.25		0.45	0.70		0.55	0.25		0.40	0.74	
Uniform Delay, d1	30.5	17.9		30.6	20.9		30.7	16.1		30.6	19.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.2	0.3		3.5	4.1		6.7	0.2		2.9	5.4	
Delay (s)	33.7	18.1		34.0	24.9		37.4	16.3		33.5	25.1	
Level of Service	C	B		C	C		D	B		C	C	
Approach Delay (s)		21.6			25.8			21.4			25.7	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	24.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	66.5	Sum of lost time (s)	17.8
Intersection Capacity Utilization	60.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	40	142	42	384	53	167	36	481
v/c Ratio	0.18	0.26	0.19	0.68	0.23	0.27	0.16	0.76
Control Delay	38.5	23.3	38.6	31.8	38.8	16.8	38.6	25.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.5	23.3	38.6	31.8	38.8	16.8	38.6	25.7
Queue Length 50th (ft)	19	52	20	171	25	46	17	166
Queue Length 95th (ft)	45	91	50	270	52	73	41	223
Internal Link Dist (ft)		1261		1184		1234		1275
Turn Bay Length (ft)								
Base Capacity (vph)	277	898	277	908	277	1039	277	1015
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.16	0.15	0.42	0.19	0.16	0.13	0.47

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	25	8	746	6	3	669
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.91	0.91	0.88	0.88
Hourly flow rate (vph)	28	9	820	7	3	760
Pedestrians	10		10			10
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	1		1			1
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1230	433			836	
vC1, stage 1 conf vol	833					
vC2, stage 2 conf vol	397					
vCu, unblocked vol	1230	433			836	
tC, single (s)	6.9	7.0			4.2	
tC, 2 stage (s)	5.9					
tF (s)	3.5	3.3			2.2	
p0 queue free %	92	98			100	
cM capacity (veh/h)	346	558			780	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	38	547	280	3	380	380
Volume Left	28	0	0	3	0	0
Volume Right	9	0	7	0	0	0
cSH	381	1700	1700	780	1700	1700
Volume to Capacity	0.10	0.32	0.16	0.00	0.22	0.22
Queue Length 95th (ft)	8	0	0	0	0	0
Control Delay (s)	15.5	0.0	0.0	9.6	0.0	0.0
Lane LOS	C			A		
Approach Delay (s)	15.5	0.0		0.0		
Approach LOS	C					

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	33.7%	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)	77	114	79	147	80	15	34	652	113	14	621	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.9		4.0	4.9		4.0	4.9		4.0	4.9	
Lane Util. Factor	1.00	1.00		0.97	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	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	0.98		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)	1752	1716		3400	1795		1752	3409		1752	3452	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1752	1716		3400	1795		1752	3409		1752	3452	
Peak-hour factor, PHF	0.90	0.90	0.90	0.83	0.83	0.83	0.88	0.88	0.88	0.92	0.92	0.92
Adj. Flow (vph)	86	127	88	177	96	18	39	741	128	15	675	60
RTOR Reduction (vph)	0	26	0	0	7	0	0	14	0	0	7	0
Lane Group Flow (vph)	86	189	0	177	107	0	39	855	0	15	728	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	6.8	14.7		9.0	16.9		3.9	27.0		1.1	24.2	
Effective Green, g (s)	6.8	14.7		9.0	16.9		3.9	27.0		1.1	24.2	
Actuated g/C Ratio	0.10	0.21		0.13	0.24		0.06	0.39		0.02	0.35	
Clearance Time (s)	4.0	4.9		4.0	4.9		4.0	4.9		4.0	4.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	171	362		440	436		98	1322		28	1200	
v/s Ratio Prot	c0.05	c0.11		0.05	0.06		c0.02	c0.25		0.01	0.21	
v/s Ratio Perm												
v/c Ratio	0.50	0.52		0.40	0.25		0.40	0.65		0.54	0.61	
Uniform Delay, d1	29.8	24.3		27.8	21.2		31.7	17.4		34.0	18.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.3	1.4		0.6	0.3		2.6	1.1		18.3	0.9	
Delay (s)	32.1	25.7		28.4	21.5		34.4	18.5		52.3	19.6	
Level of Service	C	C		C	C		C	B		D	B	
Approach Delay (s)		27.5			25.7			19.2			20.3	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM Average Control Delay	21.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	69.6	Sum of lost time (s)	17.8
Intersection Capacity Utilization	57.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	86	215	177	114	39	869	15	735
v/c Ratio	0.37	0.58	0.38	0.25	0.20	0.62	0.08	0.62
Control Delay	37.6	29.5	33.9	25.8	37.2	17.9	37.1	21.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.6	29.5	33.9	25.8	37.2	17.9	37.1	21.6
Queue Length 50th (ft)	33	69	35	37	15	123	6	136
Queue Length 95th (ft)	98	168	79	90	53	270	28	230
Internal Link Dist (ft)		2070		1225		1413		1259
Turn Bay Length (ft)	215		250		250		250	
Base Capacity (vph)	290	703	562	720	232	2265	232	2291
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.31	0.31	0.16	0.17	0.38	0.06	0.32

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	95	168	2	7	115	10	5	112	22	11	46	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.9		4.0	4.9		4.0	4.9		4.0	4.9	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		0.99	1.00		0.99	1.00		0.99	1.00	
Frt	1.00	1.00		1.00	0.99		1.00	0.98		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1841		1738	1818		1736	1790		1737	1672	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1752	1841		1738	1818		1736	1790		1737	1672	
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)	103	183	2	8	125	11	5	122	24	12	50	55
RTOR Reduction (vph)	0	1	0	0	4	0	0	8	0	0	38	0
Lane Group Flow (vph)	103	184	0	8	132	0	5	138	0	12	67	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	4.9	14.5		0.7	10.3		0.7	15.5		0.7	15.5	
Effective Green, g (s)	4.9	14.5		0.7	10.3		0.7	15.5		0.7	15.5	
Actuated g/C Ratio	0.10	0.29		0.01	0.21		0.01	0.32		0.01	0.32	
Clearance Time (s)	4.0	4.9		4.0	4.9		4.0	4.9		4.0	4.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	174	543		25	381		25	564		25	527	
v/s Ratio Prot	c0.06	c0.10		0.00	0.07		0.00	c0.08		c0.01	0.04	
v/s Ratio Perm												
v/c Ratio	0.59	0.34		0.32	0.35		0.20	0.25		0.48	0.13	
Uniform Delay, d1	21.2	13.6		24.0	16.6		24.0	12.5		24.1	12.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.3	0.4		7.3	0.6		3.9	0.2		13.8	0.1	
Delay (s)	26.5	14.0		31.3	17.1		27.9	12.7		37.9	12.1	
Level of Service	C	B		C	B		C	B		D	B	
Approach Delay (s)		18.5			17.9			13.2			14.8	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM Average Control Delay	16.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	49.2	Sum of lost time (s)	12.9
Intersection Capacity Utilization	38.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	103	185	8	136	5	146	12	105
v/c Ratio	0.26	0.25	0.03	0.29	0.02	0.20	0.04	0.15
Control Delay	21.7	11.5	26.0	18.2	26.4	16.7	25.5	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.7	11.5	26.0	18.2	26.4	16.7	25.5	10.7
Queue Length 50th (ft)	19	18	2	24	1	24	2	9
Queue Length 95th (ft)	95	119	17	101	13	105	22	57
Internal Link Dist (ft)		1271		1184		1234		1275
Turn Bay Length (ft)								
Base Capacity (vph)	710	1396	406	1217	406	1314	406	1235
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.13	0.02	0.11	0.01	0.11	0.03	0.09

Intersection Summary

Long-Term (Year 2035) With-Project Conditions

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	45	22	1028	21	10	1251
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	49	24	1117	23	11	1360
Pedestrians	10		10			10
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	1		1			1
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1850	590			1150	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1850	590			1150	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	23	95			98	
cM capacity (veh/h)	64	443			598	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	73	745	395	11	680	680
Volume Left	49	0	0	11	0	0
Volume Right	24	0	23	0	0	0
cSH	88	1700	1700	598	1700	1700
Volume to Capacity	0.82	0.44	0.23	0.02	0.40	0.40
Queue Length 95th (ft)	109	0	0	1	0	0
Control Delay (s)	135.3	0.0	0.0	11.1	0.0	0.0
Lane LOS	F			B		
Approach Delay (s)	135.3	0.0		0.1		
Approach LOS	F					

Intersection Summary			
Average Delay	3.9		
Intersection Capacity Utilization	48.0%	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 (veh/h)	11	4	10	32	18	8	8	710	4	4	1041	5
Sign Control		Stop			Stop			Free			Free	
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)	12	4	11	35	20	9	9	772	4	4	1132	5
Pedestrians		10			10			10			10	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1585	1956	588	1399	1957	408	1147			786		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1585	1956	588	1399	1957	408	1147			786		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	77	93	98	61	68	99	99			99		
cM capacity (veh/h)	52	61	444	88	61	583	600			822		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	27	63	9	514	262	4	754	383
Volume Left	12	35	9	0	0	4	0	0
Volume Right	11	9	0	0	4	0	0	5
cSH	83	86	600	1700	1700	822	1700	1700
Volume to Capacity	0.33	0.73	0.01	0.30	0.15	0.01	0.44	0.23
Queue Length 95th (ft)	31	91	1	0	0	0	0	0
Control Delay (s)	68.3	117.9	11.1	0.0	0.0	9.4	0.0	0.0
Lane LOS	F	F	B			A		
Approach Delay (s)	68.3	117.9	0.1			0.0		
Approach LOS	F	F						

Intersection Summary			
Average Delay	4.7		
Intersection Capacity Utilization	42.7%	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)	99	191	27	565	486	38	62	912	228	24	1129	143
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.9		4.0	4.9		4.0	4.9	4.9	4.0	4.9	4.9
Lane Util. Factor	0.97	0.95		0.97	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3464		3433	3495		1770	3539	1545	1770	3539	1545
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3464		3433	3495		1770	3539	1545	1770	3539	1545
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)	108	208	29	614	528	41	67	991	248	26	1227	155
RTOR Reduction (vph)	0	12	0	0	6	0	0	0	104	0	0	56
Lane Group Flow (vph)	108	225	0	614	563	0	67	991	144	26	1227	99
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	6.0	13.1		18.2	25.3		6.0	39.3	39.3	2.9	36.2	36.2
Effective Green, g (s)	6.0	13.1		18.2	25.3		6.0	39.3	39.3	2.9	36.2	36.2
Actuated g/C Ratio	0.07	0.14		0.20	0.28		0.07	0.43	0.43	0.03	0.40	0.40
Clearance Time (s)	4.0	4.9		4.0	4.9		4.0	4.9	4.9	4.0	4.9	4.9
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)	226	497		684	968		116	1523	665	56	1403	613
v/s Ratio Prot	0.03	0.06		c0.18	c0.16		c0.04	c0.28		0.01	c0.35	
v/s Ratio Perm									0.09			0.06
v/c Ratio	0.48	0.45		0.90	0.58		0.58	0.65	0.22	0.46	0.87	0.16
Uniform Delay, d1	41.1	35.8		35.6	28.4		41.4	20.6	16.3	43.4	25.5	17.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.6	0.7		14.5	0.9		6.8	1.0	0.2	6.0	6.4	0.1
Delay (s)	42.7	36.5		50.1	29.3		48.2	21.6	16.5	49.4	31.8	17.9
Level of Service	D	D		D	C		D	C	B	D	C	B
Approach Delay (s)		38.4			40.1			22.0			30.6	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM Average Control Delay	31.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	91.3	Sum of lost time (s)	17.8
Intersection Capacity Utilization	75.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	108	237	614	569	67	991	248	26	1227	155
v/c Ratio	0.37	0.48	0.87	0.56	0.45	0.63	0.31	0.19	0.88	0.23
Control Delay	44.0	36.3	49.5	30.2	51.0	22.9	7.4	44.2	35.6	10.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.0	36.3	49.5	30.2	51.0	22.9	7.4	44.2	35.6	10.4
Queue Length 50th (ft)	29	62	173	151	36	185	18	14	334	22
Queue Length 95th (ft)	61	97	#319	204	86	383	88	42	#569	74
Internal Link Dist (ft)		2070		1235		1413			1259	
Turn Bay Length (ft)	250		250		250		150	250		150
Base Capacity (vph)	315	885	709	1288	163	1581	790	163	1389	662
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.27	0.87	0.44	0.41	0.63	0.31	0.16	0.88	0.23

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	103	112	26	193	516	87	57	532	139	70	626	388
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9		4.9	4.9		4.9	4.9	4.9	4.9	4.9	4.9
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3423		1770	3451		1770	3539	1547	1770	3539	1547
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3423		1770	3451		1770	3539	1547	1770	3539	1547
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	117	127	30	219	586	99	65	605	158	80	711	441
RTOR Reduction (vph)	0	20	0	0	13	0	0	0	113	0	0	282
Lane Group Flow (vph)	117	137	0	219	672	0	65	605	45	80	711	159
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	8.3	17.8		15.5	25.0		5.7	23.7	23.7	6.7	24.7	24.7
Effective Green, g (s)	8.3	17.8		15.5	25.0		5.7	23.7	23.7	6.7	24.7	24.7
Actuated g/C Ratio	0.10	0.21		0.19	0.30		0.07	0.28	0.28	0.08	0.30	0.30
Clearance Time (s)	4.9	4.9		4.9	4.9		4.9	4.9	4.9	4.9	4.9	4.9
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)	176	731		329	1036		121	1007	440	142	1049	459
v/s Ratio Prot	0.07	0.04		c0.12	c0.19		0.04	0.17		c0.05	c0.20	
v/s Ratio Perm									0.03			0.10
v/c Ratio	0.66	0.19		0.67	0.65		0.54	0.60	0.10	0.56	0.68	0.35
Uniform Delay, d1	36.2	26.8		31.5	25.3		37.5	25.7	22.0	36.9	25.8	23.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	9.1	0.1		5.0	1.4		4.5	1.0	0.1	5.0	1.8	0.5
Delay (s)	45.3	26.9		36.5	26.7		42.1	26.7	22.1	41.9	27.6	23.4
Level of Service	D	C		D	C		D	C	C	D	C	C
Approach Delay (s)		34.8			29.1			27.0			27.0	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	28.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	83.3	Sum of lost time (s)	9.8
Intersection Capacity Utilization	60.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	117	157	219	685	65	605	158	80	711	441
v/c Ratio	0.50	0.23	0.65	0.64	0.39	0.59	0.28	0.42	0.66	0.59
Control Delay	46.5	26.6	44.1	30.4	48.6	29.9	6.3	47.1	30.4	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.5	26.6	44.1	30.4	48.6	29.9	6.3	47.1	30.4	8.0
Queue Length 50th (ft)	62	32	115	178	35	153	0	42	182	16
Queue Length 95th (ft)	125	62	201	253	82	227	44	94	263	92
Internal Link Dist (ft)		1261		1184		1234			1275	
Turn Bay Length (ft)	250		250		250		150	250		150
Base Capacity (vph)	312	1032	479	1359	193	1344	684	241	1440	866
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.15	0.46	0.50	0.34	0.45	0.23	0.33	0.49	0.51

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	47	397	988	2	4	101
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	51	432	1074	2	4	110
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		1315				
pX, platoon unblocked						
vC, conflicting volume	1076				1393	538
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1076				1393	538
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	92				96	77
cM capacity (veh/h)	644				122	488

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	51	216	216	716	360	114
Volume Left	51	0	0	0	0	4
Volume Right	0	0	0	0	2	110
cSH	644	1700	1700	1700	1700	438
Volume to Capacity	0.08	0.13	0.13	0.42	0.21	0.26
Queue Length 95th (ft)	6	0	0	0	0	26
Control Delay (s)	11.1	0.0	0.0	0.0	0.0	16.1
Lane LOS	B					C
Approach Delay (s)	1.2			0.0		16.1
Approach LOS						C

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	47.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	31	10	1506	11	5	1238
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	34	11	1637	12	5	1346
Pedestrians	10		10			10
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	1		1			1
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2347	844			1659	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2347	844			1659	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	96			99	
cM capacity (veh/h)	29	301			381	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	45	1091	558	5	673	673
Volume Left	34	0	0	5	0	0
Volume Right	11	0	12	0	0	0
cSH	38	1700	1700	381	1700	1700
Volume to Capacity	1.19	0.64	0.33	0.01	0.40	0.40
Queue Length 95th (ft)	114	0	0	1	0	0
Control Delay (s)	372.8	0.0	0.0	14.6	0.0	0.0
Lane LOS	F			B		
Approach Delay (s)	372.8	0.0		0.1		
Approach LOS	F					

Intersection Summary			
Average Delay	5.5		
Intersection Capacity Utilization	54.8%	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 (veh/h)	7	10	6	6	8	8	2	993	18	10	807	2
Sign Control		Stop			Stop			Free			Free	
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)	8	11	7	7	9	9	2	1079	20	11	877	2
Pedestrians		10			10			10			10	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1477	2023	460	1586	2015	569	889			1109		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1477	2023	460	1586	2015	569	889			1109		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	89	80	99	89	84	98	100			98		
cM capacity (veh/h)	72	55	539	58	56	457	751			620		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	25	24	2	720	379	11	585	295
Volume Left	8	7	2	0	0	11	0	0
Volume Right	7	9	0	0	20	0	0	2
cSH	80	83	751	1700	1700	620	1700	1700
Volume to Capacity	0.31	0.29	0.00	0.42	0.22	0.02	0.34	0.17
Queue Length 95th (ft)	29	26	0	0	0	1	0	0
Control Delay (s)	69.8	64.6	9.8	0.0	0.0	10.9	0.0	0.0
Lane LOS	F	F	A			B		
Approach Delay (s)	69.8	64.6	0.0			0.1		
Approach LOS	F	F						

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	40.9%	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)	351	525	104	368	305	49	24	1117	246	25	1059	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.9		4.0	4.9		4.0	4.9	4.9	4.0	4.9	4.9
Lane Util. Factor	0.97	0.95		0.97	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3438		3433	3455		1770	3539	1545	1770	3539	1545
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3438		3433	3455		1770	3539	1545	1770	3539	1545
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)	382	571	113	400	332	53	26	1214	267	27	1151	201
RTOR Reduction (vph)	0	16	0	0	12	0	0	0	105	0	0	82
Lane Group Flow (vph)	382	668	0	400	373	0	26	1214	162	27	1151	119
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	12.3	20.9		12.3	20.9		2.8	37.2	37.2	4.1	38.5	38.5
Effective Green, g (s)	12.3	20.9		12.3	20.9		2.8	37.2	37.2	4.1	38.5	38.5
Actuated g/C Ratio	0.13	0.23		0.13	0.23		0.03	0.40	0.40	0.04	0.42	0.42
Clearance Time (s)	4.0	4.9		4.0	4.9		4.0	4.9	4.9	4.0	4.9	4.9
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)	457	778		457	782		54	1426	623	79	1476	644
v/s Ratio Prot	0.11	c0.19		c0.12	0.11		0.01	c0.34		c0.02	0.33	
v/s Ratio Perm									0.10			0.08
v/c Ratio	0.84	0.86		0.88	0.48		0.48	0.85	0.26	0.34	0.78	0.19
Uniform Delay, d1	39.0	34.3		39.2	31.0		44.0	25.0	18.4	42.8	23.2	17.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	12.5	9.3		16.8	0.5		6.6	5.1	0.2	2.6	2.7	0.1
Delay (s)	51.5	43.6		56.1	31.4		50.7	30.1	18.6	45.4	25.9	17.1
Level of Service	D	D		E	C		D	C	B	D	C	B
Approach Delay (s)		46.4			44.0			28.4			25.0	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM Average Control Delay	34.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	92.3	Sum of lost time (s)	17.8
Intersection Capacity Utilization	71.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	382	684	400	385	26	1214	267	27	1151	201
v/c Ratio	0.82	0.84	0.86	0.47	0.19	0.85	0.37	0.20	0.76	0.27
Control Delay	55.8	44.2	59.4	32.3	46.5	31.8	8.8	46.5	26.6	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.8	44.2	59.4	32.3	46.5	31.8	8.8	46.5	26.6	7.4
Queue Length 50th (ft)	124	213	130	107	16	356	35	16	261	18
Queue Length 95th (ft)	#214	#318	#227	155	42	457	95	44	423	71
Internal Link Dist (ft)		2070		1235		1413			1259	
Turn Bay Length (ft)	250		250		250		150	250		150
Base Capacity (vph)	467	877	467	878	161	1610	798	161	1688	809
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.78	0.86	0.44	0.16	0.75	0.33	0.17	0.68	0.25

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	280	465	8	98	331	47	18	686	139	42	604	173
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9		4.9	4.9		4.9	4.9	4.9	4.9	4.9	4.9
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	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		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3529		1770	3464		1770	3539	1546	1770	3539	1546
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3529		1770	3464		1770	3539	1546	1770	3539	1546
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	318	528	9	111	376	53	20	780	158	48	686	197
RTOR Reduction (vph)	0	1	0	0	11	0	0	0	96	0	0	133
Lane Group Flow (vph)	318	536	0	111	418	0	20	780	62	48	686	64
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	19.4	28.6		8.1	17.3		2.3	24.7	24.7	3.6	26.0	26.0
Effective Green, g (s)	19.4	28.6		8.1	17.3		2.3	24.7	24.7	3.6	26.0	26.0
Actuated g/C Ratio	0.23	0.34		0.10	0.20		0.03	0.29	0.29	0.04	0.31	0.31
Clearance Time (s)	4.9	4.9		4.9	4.9		4.9	4.9	4.9	4.9	4.9	4.9
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)	406	1193		169	708		48	1033	451	75	1088	475
v/s Ratio Prot	c0.18	0.15		0.06	c0.12		0.01	c0.22		c0.03	0.19	
v/s Ratio Perm									0.04			0.04
v/c Ratio	0.78	0.45		0.66	0.59		0.42	0.76	0.14	0.64	0.63	0.13
Uniform Delay, d1	30.6	21.9		36.9	30.4		40.5	27.2	22.1	39.9	25.2	21.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	9.5	0.3		8.9	1.3		5.8	3.2	0.1	17.1	1.2	0.1
Delay (s)	40.1	22.1		45.8	31.8		46.3	30.4	22.2	57.0	26.4	21.3
Level of Service	D	C		D	C		D	C	C	E	C	C
Approach Delay (s)		28.8			34.6			29.4			26.9	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	29.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	84.6	Sum of lost time (s)	19.6
Intersection Capacity Utilization	67.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	318	537	111	429	20	780	158	48	686	197
v/c Ratio	0.75	0.43	0.50	0.63	0.14	0.74	0.29	0.32	0.60	0.31
Control Delay	44.0	24.6	46.8	35.5	44.8	32.7	8.7	47.6	27.5	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.0	24.6	46.8	35.5	44.8	32.7	8.7	47.6	27.5	6.2
Queue Length 50th (ft)	175	137	63	122	11	217	10	28	147	2
Queue Length 95th (ft)	#308	185	120	170	35	303	56	65	261	51
Internal Link Dist (ft)		1261		1184		1234			1275	
Turn Bay Length (ft)	250		250		250		150	250		150
Base Capacity (vph)	543	1547	284	1021	167	1325	662	167	1414	732
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.35	0.39	0.42	0.12	0.59	0.24	0.29	0.49	0.27

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	4	793	673	0	2	49
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	862	732	0	2	53
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		1315				
pX, platoon unblocked					0.87	
vC, conflicting volume	732				1171	366
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	732				905	366
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				99	92
cM capacity (veh/h)	869				240	631

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	4	431	431	488	244	55
Volume Left	4	0	0	0	0	2
Volume Right	0	0	0	0	0	53
cSH	869	1700	1700	1700	1700	593
Volume to Capacity	0.01	0.25	0.25	0.29	0.14	0.09
Queue Length 95th (ft)	0	0	0	0	0	8
Control Delay (s)	9.2	0.0	0.0	0.0	0.0	11.7
Lane LOS	A					B
Approach Delay (s)	0.0			0.0		11.7
Approach LOS						B

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	31.9%	ICU Level of Service	A
Analysis Period (min)	15		

Long-Term (Year 2035) With-Project Conditions
(With McKinley Avenue Realignment)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	44	55	221	283	299	123	252	739	147	33	826	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.9	4.9	4.0	4.9	4.9	4.0	4.9	4.9	4.0	4.9	4.9
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	0.97	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	0.96	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	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	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	3433	1863	1546	3433	3539	1522	1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	3433	1863	1546	3433	3539	1522	1770	3539	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)	48	60	240	308	325	134	274	803	160	36	898	107
RTOR Reduction (vph)	0	0	163	0	0	98	0	0	90	0	0	58
Lane Group Flow (vph)	48	60	77	308	325	36	274	803	70	36	898	49
Confl. Peds. (#/hr)				10		10			10	10		
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	4.1	15.2	15.2	11.8	22.9	22.9	10.6	36.2	36.2	4.0	29.6	29.6
Effective Green, g (s)	4.1	15.2	15.2	11.8	22.9	22.9	10.6	36.2	36.2	4.0	29.6	29.6
Actuated g/C Ratio	0.05	0.18	0.18	0.14	0.27	0.27	0.12	0.43	0.43	0.05	0.35	0.35
Clearance Time (s)	4.0	4.9	4.9	4.0	4.9	4.9	4.0	4.9	4.9	4.0	4.9	4.9
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	85	333	283	477	502	417	428	1507	648	83	1232	551
v/s Ratio Prot	0.03	0.03		c0.09	c0.17		c0.08	0.23		0.02	c0.25	
v/s Ratio Perm			0.05			0.02			0.05			0.03
v/c Ratio	0.56	0.18	0.27	0.65	0.65	0.09	0.64	0.53	0.11	0.43	0.73	0.09
Uniform Delay, d1	39.6	29.6	30.1	34.6	27.5	23.2	35.4	18.1	14.7	39.4	24.2	18.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.3	0.3	0.5	3.0	2.9	0.1	3.3	0.4	0.1	3.6	2.2	0.1
Delay (s)	47.9	29.9	30.7	37.6	30.3	23.3	38.6	18.5	14.8	43.0	26.4	18.7
Level of Service	D	C	C	D	C	C	D	B	B	D	C	B
Approach Delay (s)		32.9			32.0			22.5			26.2	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	26.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	12.9
Intersection Capacity Utilization	64.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	48	60	240	308	325	134	274	803	160	36	898	107
v/c Ratio	0.30	0.20	0.57	0.62	0.62	0.25	0.62	0.51	0.21	0.24	0.75	0.18
Control Delay	45.9	32.7	14.0	41.9	34.7	6.7	43.9	20.4	4.4	44.7	29.3	7.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.9	32.7	14.0	41.9	34.7	6.7	43.9	20.4	4.4	44.7	29.3	7.7
Queue Length 50th (ft)	25	28	19	80	163	0	73	178	1	19	224	6
Queue Length 95th (ft)	66	65	90	143	278	44	#140	270	41	54	326	43
Internal Link Dist (ft)		513			1254			1259			1278	
Turn Bay Length (ft)	250		150	250		150	250		150	250		150
Base Capacity (vph)	182	528	591	573	648	624	484	1775	839	182	1639	781
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.11	0.41	0.54	0.50	0.21	0.57	0.45	0.19	0.20	0.55	0.14

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑	↱	↰	↑↱		↰	↑↱	
Volume (vph)	29	132	33	153	366	109	130	555	36	41	898	148
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.9	4.9	4.0	4.9	4.9	4.0	4.9		4.0	4.9	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	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	0.99		1.00	0.98	
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	1546	1770	1863	1546	1770	3499		1770	3445	
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	1546	1770	1863	1546	1770	3499		1770	3445	
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)	32	143	36	166	398	118	141	603	39	45	976	161
RTOR Reduction (vph)	0	0	29	0	0	84	0	5	0	0	14	0
Lane Group Flow (vph)	32	143	7	166	398	34	141	637	0	45	1123	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	4.3	17.3	17.3	11.0	24.0	24.0	8.1	35.3		4.4	31.6	
Effective Green, g (s)	4.3	17.3	17.3	11.0	24.0	24.0	8.1	35.3		4.4	31.6	
Actuated g/C Ratio	0.05	0.20	0.20	0.13	0.28	0.28	0.09	0.41		0.05	0.37	
Clearance Time (s)	4.0	4.9	4.9	4.0	4.9	4.9	4.0	4.9		4.0	4.9	
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)	89	376	312	227	521	432	167	1440		91	1269	
v/s Ratio Prot	0.02	0.08		c0.09	c0.21		c0.08	c0.18		0.03	c0.33	
v/s Ratio Perm			0.00			0.02						
v/c Ratio	0.36	0.38	0.02	0.73	0.76	0.08	0.84	0.44		0.49	0.89	
Uniform Delay, d1	39.4	29.6	27.5	36.0	28.3	22.8	38.2	18.2		39.6	25.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.5	0.6	0.0	11.5	6.6	0.1	30.3	0.2		4.2	7.7	
Delay (s)	41.9	30.3	27.5	47.4	34.9	22.8	68.6	18.4		43.8	33.1	
Level of Service	D	C	C	D	C	C	E	B		D	C	
Approach Delay (s)		31.6			35.9			27.4			33.5	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM Average Control Delay	32.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	85.8	Sum of lost time (s)	17.8
Intersection Capacity Utilization	74.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	32	143	36	166	398	118	141	642	45	1137
v/c Ratio	0.22	0.41	0.11	0.70	0.73	0.22	0.81	0.43	0.30	0.90
Control Delay	41.4	32.7	10.2	52.7	36.6	6.2	73.6	20.4	43.1	37.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.4	32.7	10.2	52.7	36.6	6.2	73.6	20.4	43.1	37.5
Queue Length 50th (ft)	17	67	0	87	200	0	77	141	23	305
Queue Length 95th (ft)	45	118	23	#182	#314	39	#192	207	58	#473
Internal Link Dist (ft)		1246			599			1275		1301
Turn Bay Length (ft)	250		150	250		150	250		250	
Base Capacity (vph)	174	506	446	261	598	575	174	1505	174	1289
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.28	0.08	0.64	0.67	0.21	0.81	0.43	0.26	0.88

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	98	191	27	565	486	38	62	912	228	24	1129	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.9		4.0	4.9		4.0	4.9	4.9	4.0	4.9	4.9
Lane Util. Factor	0.97	0.95		0.97	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3464		3433	3495		1770	3539	1545	1770	3539	1545
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3464		3433	3495		1770	3539	1545	1770	3539	1545
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)	107	208	29	614	528	41	67	991	248	26	1227	152
RTOR Reduction (vph)	0	12	0	0	6	0	0	0	104	0	0	54
Lane Group Flow (vph)	107	225	0	614	563	0	67	991	144	26	1227	98
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	6.0	13.1		18.2	25.3		6.0	39.3	39.3	2.9	36.2	36.2
Effective Green, g (s)	6.0	13.1		18.2	25.3		6.0	39.3	39.3	2.9	36.2	36.2
Actuated g/C Ratio	0.07	0.14		0.20	0.28		0.07	0.43	0.43	0.03	0.40	0.40
Clearance Time (s)	4.0	4.9		4.0	4.9		4.0	4.9	4.9	4.0	4.9	4.9
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)	226	497		684	968		116	1523	665	56	1403	613
v/s Ratio Prot	0.03	0.06		c0.18	c0.16		c0.04	c0.28		0.01	c0.35	
v/s Ratio Perm									0.09			0.06
v/c Ratio	0.47	0.45		0.90	0.58		0.58	0.65	0.22	0.46	0.87	0.16
Uniform Delay, d1	41.1	35.8		35.6	28.4		41.4	20.6	16.3	43.4	25.5	17.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.6	0.7		14.5	0.9		6.8	1.0	0.2	6.0	6.4	0.1
Delay (s)	42.7	36.5		50.1	29.3		48.2	21.6	16.5	49.4	31.8	17.9
Level of Service	D	D		D	C		D	C	B	D	C	B
Approach Delay (s)		38.4			40.1			22.0			30.6	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM Average Control Delay	31.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	91.3	Sum of lost time (s)	17.8
Intersection Capacity Utilization	75.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	107	237	614	569	67	991	248	26	1227	152
v/c Ratio	0.37	0.48	0.87	0.56	0.45	0.63	0.31	0.19	0.88	0.23
Control Delay	44.0	36.3	49.5	30.2	51.0	22.9	7.4	44.2	35.6	10.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.0	36.3	49.5	30.2	51.0	22.9	7.4	44.2	35.6	10.4
Queue Length 50th (ft)	29	62	173	151	36	185	18	14	334	22
Queue Length 95th (ft)	61	97	#319	204	86	383	88	42	#569	73
Internal Link Dist (ft)		2070		1235		1413			1259	
Turn Bay Length (ft)	250		250		250		150	250		150
Base Capacity (vph)	315	885	709	1288	163	1581	790	163	1389	660
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.27	0.87	0.44	0.41	0.63	0.31	0.16	0.88	0.23

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	103	112	26	193	516	87	57	532	139	70	626	388
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.9		4.0	4.9		4.0	4.9	4.9	4.0	4.9	4.9
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3423		1770	3451		1770	3539	1549	1770	3539	1549
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3423		1770	3451		1770	3539	1549	1770	3539	1549
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	117	127	30	219	586	99	65	605	158	80	711	441
RTOR Reduction (vph)	0	25	0	0	16	0	0	0	111	0	0	282
Lane Group Flow (vph)	117	132	0	219	669	0	65	605	47	80	711	159
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	7.6	13.1		15.8	21.3		5.5	22.4	22.4	5.6	22.5	22.5
Effective Green, g (s)	7.6	13.1		15.8	21.3		5.5	22.4	22.4	5.6	22.5	22.5
Actuated g/C Ratio	0.10	0.18		0.21	0.29		0.07	0.30	0.30	0.07	0.30	0.30
Clearance Time (s)	4.0	4.9		4.0	4.9		4.0	4.9	4.9	4.0	4.9	4.9
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)	180	600		374	984		130	1061	464	133	1066	467
v/s Ratio Prot	0.07	0.04		c0.12	c0.19		0.04	0.17		c0.05	c0.20	
v/s Ratio Perm									0.03			0.10
v/c Ratio	0.65	0.22		0.59	0.68		0.50	0.57	0.10	0.60	0.67	0.34
Uniform Delay, d1	32.3	26.4		26.5	23.7		33.3	22.1	18.9	33.5	22.8	20.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.1	0.2		2.3	1.9		3.0	0.7	0.1	7.5	1.6	0.4
Delay (s)	40.4	26.6		28.8	25.6		36.3	22.8	19.0	40.9	24.4	20.8
Level of Service	D	C		C	C		D	C	B	D	C	C
Approach Delay (s)		32.5			26.4			23.2			24.2	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	25.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	74.7	Sum of lost time (s)	8.0
Intersection Capacity Utilization	59.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Cumulative 2035 Plus Project With McKinley-AM
Mitigated

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	117	157	219	685	65	605	158	80	711	441
v/c Ratio	0.47	0.21	0.57	0.69	0.34	0.56	0.27	0.41	0.65	0.59
Control Delay	41.6	22.9	38.6	28.9	42.5	26.8	6.0	44.3	28.5	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.6	22.9	38.6	28.9	42.5	26.8	6.0	44.3	28.5	7.8
Queue Length 50th (ft)	58	28	108	167	33	140	0	40	171	14
Queue Length 95th (ft)	114	54	187	225	75	207	42	88	247	89
Internal Link Dist (ft)		1261		1184		1234			1275	
Turn Bay Length (ft)	250		250		250		150	250		150
Base Capacity (vph)	335	1206	474	1480	223	1406	709	223	1406	857
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.13	0.46	0.46	0.29	0.43	0.22	0.36	0.51	0.51

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	47	397	988	2	4	101
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	51	432	1074	2	4	110
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		1315				
pX, platoon unblocked						
vC, conflicting volume	1076				1393	538
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1076				1393	538
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	92				96	77
cM capacity (veh/h)	644				122	488

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	51	216	216	716	360	114
Volume Left	51	0	0	0	0	4
Volume Right	0	0	0	0	2	110
cSH	644	1700	1700	1700	1700	438
Volume to Capacity	0.08	0.13	0.13	0.42	0.21	0.26
Queue Length 95th (ft)	6	0	0	0	0	26
Control Delay (s)	11.1	0.0	0.0	0.0	0.0	16.1
Lane LOS	B					C
Approach Delay (s)	1.2			0.0		16.1
Approach LOS						C

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	47.2%	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)	104	254	241	211	133	60	326	908	283	105	801	81
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.9	4.9	4.0	4.9	4.9	4.0	4.9	4.9	4.0	4.9	4.9
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	0.97	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	0.96	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	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	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	3433	1863	1546	3433	3539	1520	1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	3433	1863	1546	3433	3539	1520	1770	3539	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)	113	276	262	229	145	65	354	987	308	114	871	88
RTOR Reduction (vph)	0	0	194	0	0	50	0	0	148	0	0	50
Lane Group Flow (vph)	113	276	68	229	145	15	354	987	160	114	871	38
Confl. Peds. (#/hr)				10		10			10	10		
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	7.9	19.2	19.2	9.0	20.3	20.3	12.9	34.5	34.5	7.9	29.5	29.5
Effective Green, g (s)	7.9	19.2	19.2	9.0	20.3	20.3	12.9	34.5	34.5	7.9	29.5	29.5
Actuated g/C Ratio	0.09	0.22	0.22	0.10	0.23	0.23	0.15	0.39	0.39	0.09	0.33	0.33
Clearance Time (s)	4.0	4.9	4.9	4.0	4.9	4.9	4.0	4.9	4.9	4.0	4.9	4.9
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	158	405	344	350	428	355	501	1381	593	158	1181	528
v/s Ratio Prot	0.06	c0.15		c0.07	0.08		c0.10	c0.28		0.06	0.25	
v/s Ratio Perm			0.04			0.01			0.11			0.02
v/c Ratio	0.72	0.68	0.20	0.65	0.34	0.04	0.71	0.71	0.27	0.72	0.74	0.07
Uniform Delay, d1	39.2	31.8	28.3	38.2	28.4	26.5	35.9	22.8	18.4	39.2	26.0	20.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	14.3	4.7	0.3	4.4	0.5	0.0	4.5	1.8	0.2	15.0	2.4	0.1
Delay (s)	53.4	36.5	28.6	42.6	28.9	26.5	40.5	24.6	18.6	54.2	28.5	20.2
Level of Service	D	D	C	D	C	C	D	C	B	D	C	C
Approach Delay (s)		36.2			35.7			26.9			30.5	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM Average Control Delay	30.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	88.4	Sum of lost time (s)	12.9
Intersection Capacity Utilization	65.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	113	276	262	229	145	65	354	987	308	114	871	88
v/c Ratio	0.57	0.71	0.50	0.65	0.33	0.16	0.69	0.70	0.41	0.58	0.75	0.15
Control Delay	51.9	43.6	8.7	49.7	34.1	9.5	45.1	26.8	7.3	52.1	31.1	7.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.9	43.6	8.7	49.7	34.1	9.5	45.1	26.8	7.3	52.1	31.1	7.9
Queue Length 50th (ft)	62	148	6	67	74	0	100	256	25	63	230	5
Queue Length 95th (ft)	#128	244	71	#127	136	34	#164	355	90	#130	320	38
Internal Link Dist (ft)		513			1254			1259			1278	
Turn Bay Length (ft)	250		150	250		150	250		150	250		150
Base Capacity (vph)	231	532	630	366	491	455	570	1598	817	231	1472	702
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.52	0.42	0.63	0.30	0.14	0.62	0.62	0.38	0.49	0.59	0.13

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	481	100	100	241	81	71	818	124	130	643	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.9	4.9	4.0	4.9	4.9	4.0	4.9		4.0	4.9	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.97	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	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	0.98		1.00	0.99	
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	1543	1770	1863	1543	1770	3450		1770	3498	
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	1543	1770	1863	1543	1770	3450		1770	3498	
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)	98	523	109	109	262	88	77	889	135	141	699	45
RTOR Reduction (vph)	0	0	53	0	0	61	0	12	0	0	4	0
Lane Group Flow (vph)	98	523	56	109	262	27	77	1012	0	141	740	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	8.5	30.4	30.4	8.0	29.9	29.9	6.8	33.3		9.0	35.5	
Effective Green, g (s)	8.5	30.4	30.4	8.0	29.9	29.9	6.8	33.3		9.0	35.5	
Actuated g/C Ratio	0.09	0.31	0.31	0.08	0.30	0.30	0.07	0.34		0.09	0.36	
Clearance Time (s)	4.0	4.9	4.9	4.0	4.9	4.9	4.0	4.9		4.0	4.9	
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)	153	575	476	144	566	468	122	1166		162	1261	
v/s Ratio Prot	0.06	c0.28		c0.06	0.14		0.04	c0.29		c0.08	0.21	
v/s Ratio Perm			0.04			0.02						
v/c Ratio	0.64	0.91	0.12	0.76	0.46	0.06	0.63	0.87		0.87	0.59	
Uniform Delay, d1	43.5	32.7	24.4	44.3	27.8	24.3	44.6	30.5		44.2	25.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	8.8	18.3	0.1	20.1	0.6	0.1	10.2	7.0		36.4	0.7	
Delay (s)	52.3	51.0	24.5	64.4	28.4	24.4	54.8	37.6		80.6	26.2	
Level of Service	D	D	C	E	C	C	D	D		F	C	
Approach Delay (s)		47.2			36.2			38.8			34.9	
Approach LOS		D			D			D			C	

Intersection Summary			
HCM Average Control Delay	39.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	98.5	Sum of lost time (s)	12.9
Intersection Capacity Utilization	79.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	98	523	109	109	262	88	77	1024	141	744
v/c Ratio	0.54	0.92	0.21	0.75	0.46	0.16	0.52	0.88	0.85	0.58
Control Delay	53.0	56.6	10.8	75.2	32.2	7.2	56.3	40.0	85.8	27.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.0	56.6	10.8	75.2	32.2	7.2	56.3	40.0	85.8	27.8
Queue Length 50th (ft)	60	318	15	69	139	0	48	312	90	204
Queue Length 95th (ft)	111	#513	54	#160	222	37	95	#410	#203	267
Internal Link Dist (ft)		1246			599			1275		1301
Turn Bay Length (ft)	250		150	250		150	250		250	
Base Capacity (vph)	221	602	550	147	575	537	165	1234	165	1288
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.87	0.20	0.74	0.46	0.16	0.47	0.83	0.85	0.58

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	351	525	104	368	305	49	24	1117	246	25	1059	184
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.9		4.0	4.9		4.0	4.9	4.9	4.0	4.9	4.9
Lane Util. Factor	0.97	0.95		0.97	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3438		3433	3455		1770	3539	1545	1770	3539	1545
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3438		3433	3455		1770	3539	1545	1770	3539	1545
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)	382	571	113	400	332	53	26	1214	267	27	1151	200
RTOR Reduction (vph)	0	16	0	0	12	0	0	0	105	0	0	81
Lane Group Flow (vph)	382	668	0	400	373	0	26	1214	162	27	1151	119
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	12.3	20.9		12.3	20.9		2.8	37.2	37.2	4.1	38.5	38.5
Effective Green, g (s)	12.3	20.9		12.3	20.9		2.8	37.2	37.2	4.1	38.5	38.5
Actuated g/C Ratio	0.13	0.23		0.13	0.23		0.03	0.40	0.40	0.04	0.42	0.42
Clearance Time (s)	4.0	4.9		4.0	4.9		4.0	4.9	4.9	4.0	4.9	4.9
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)	457	778		457	782		54	1426	623	79	1476	644
v/s Ratio Prot	0.11	c0.19		c0.12	0.11		0.01	c0.34		c0.02	0.33	
v/s Ratio Perm									0.10			0.08
v/c Ratio	0.84	0.86		0.88	0.48		0.48	0.85	0.26	0.34	0.78	0.18
Uniform Delay, d1	39.0	34.3		39.2	31.0		44.0	25.0	18.4	42.8	23.2	17.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	12.5	9.3		16.8	0.5		6.6	5.1	0.2	2.6	2.7	0.1
Delay (s)	51.5	43.6		56.1	31.4		50.7	30.1	18.6	45.4	25.9	17.1
Level of Service	D	D		E	C		D	C	B	D	C	B
Approach Delay (s)		46.4			44.0			28.4			25.0	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM Average Control Delay	34.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	92.3	Sum of lost time (s)	17.8
Intersection Capacity Utilization	71.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	382	684	400	385	26	1214	267	27	1151	200
v/c Ratio	0.82	0.84	0.86	0.47	0.19	0.85	0.37	0.20	0.76	0.27
Control Delay	55.8	44.2	59.4	32.3	46.5	31.8	8.8	46.5	26.6	7.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.8	44.2	59.4	32.3	46.5	31.8	8.8	46.5	26.6	7.5
Queue Length 50th (ft)	124	213	130	107	16	356	35	16	261	19
Queue Length 95th (ft)	#214	#318	#227	155	42	457	95	44	423	71
Internal Link Dist (ft)		2070		1235		1413			1259	
Turn Bay Length (ft)	250		250		250		150	250		150
Base Capacity (vph)	467	877	467	878	161	1610	798	161	1688	809
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.78	0.86	0.44	0.16	0.75	0.33	0.17	0.68	0.25

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	280	465	8	98	331	47	18	686	139	42	604	173
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.9		4.0	4.9		4.0	4.9	4.9	4.0	4.9	4.9
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	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		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3529		1770	3464		1770	3539	1548	1770	3539	1548
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3529		1770	3464		1770	3539	1548	1770	3539	1548
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	318	528	9	111	376	53	20	780	158	48	686	197
RTOR Reduction (vph)	0	1	0	0	13	0	0	0	105	0	0	137
Lane Group Flow (vph)	318	536	0	111	416	0	20	780	53	48	686	60
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	17.3	25.4		7.9	16.0		2.6	22.2	22.2	4.1	23.7	23.7
Effective Green, g (s)	17.3	25.4		7.9	16.0		2.6	22.2	22.2	4.1	23.7	23.7
Actuated g/C Ratio	0.22	0.33		0.10	0.21		0.03	0.29	0.29	0.05	0.31	0.31
Clearance Time (s)	4.0	4.9		4.0	4.9		4.0	4.9	4.9	4.0	4.9	4.9
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)	396	1158		181	716		59	1015	444	94	1084	474
v/s Ratio Prot	c0.18	0.15		0.06	c0.12		0.01	c0.22		c0.03	0.19	
v/s Ratio Perm									0.03			0.04
v/c Ratio	0.80	0.46		0.61	0.58		0.34	0.77	0.12	0.51	0.63	0.13
Uniform Delay, d1	28.4	20.6		33.3	27.7		36.6	25.2	20.4	35.7	23.1	19.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	11.2	0.3		6.0	1.2		3.4	3.6	0.1	4.6	1.2	0.1
Delay (s)	39.6	20.9		39.3	28.9		40.0	28.8	20.5	40.3	24.3	19.5
Level of Service	D	C		D	C		D	C	C	D	C	B
Approach Delay (s)		27.9			31.0			27.7			24.1	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	27.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	77.4	Sum of lost time (s)	17.8
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	318	537	111	429	20	780	158	48	686	197
v/c Ratio	0.77	0.44	0.48	0.61	0.13	0.76	0.29	0.28	0.61	0.31
Control Delay	44.5	23.7	41.1	31.4	38.7	31.6	7.2	40.6	25.5	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.5	23.7	41.1	31.4	38.7	31.6	7.2	40.6	25.5	5.6
Queue Length 50th (ft)	158	124	54	105	10	191	4	24	126	0
Queue Length 95th (ft)	#319	173	109	148	32	280	48	60	241	47
Internal Link Dist (ft)		1261		1184		1234			1275	
Turn Bay Length (ft)	250		250		250		150	250		150
Base Capacity (vph)	449	1394	299	1085	200	1207	624	200	1314	698
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.39	0.37	0.40	0.10	0.65	0.25	0.24	0.52	0.28

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	4	793	673	0	2	49
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	862	732	0	2	53
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		1315				
pX, platoon unblocked					0.87	
vC, conflicting volume	732				1171	366
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	732				905	366
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				99	92
cM capacity (veh/h)	869				240	631

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	4	431	431	366	366	55
Volume Left	4	0	0	0	0	2
Volume Right	0	0	0	0	0	53
cSH	869	1700	1700	1700	1700	593
Volume to Capacity	0.01	0.25	0.25	0.22	0.22	0.09
Queue Length 95th (ft)	0	0	0	0	0	8
Control Delay (s)	9.2	0.0	0.0	0.0	0.0	11.7
Lane LOS	A					B
Approach Delay (s)	0.0			0.0		11.7
Approach LOS						B

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	31.9%	ICU Level of Service	A
Analysis Period (min)	15		