San Joaquin Valley Growth Response Study, Phase III
Fresno- Clovis-Southeast Madera Region
Demonstration Project

EXECUTIVE SUMMARY

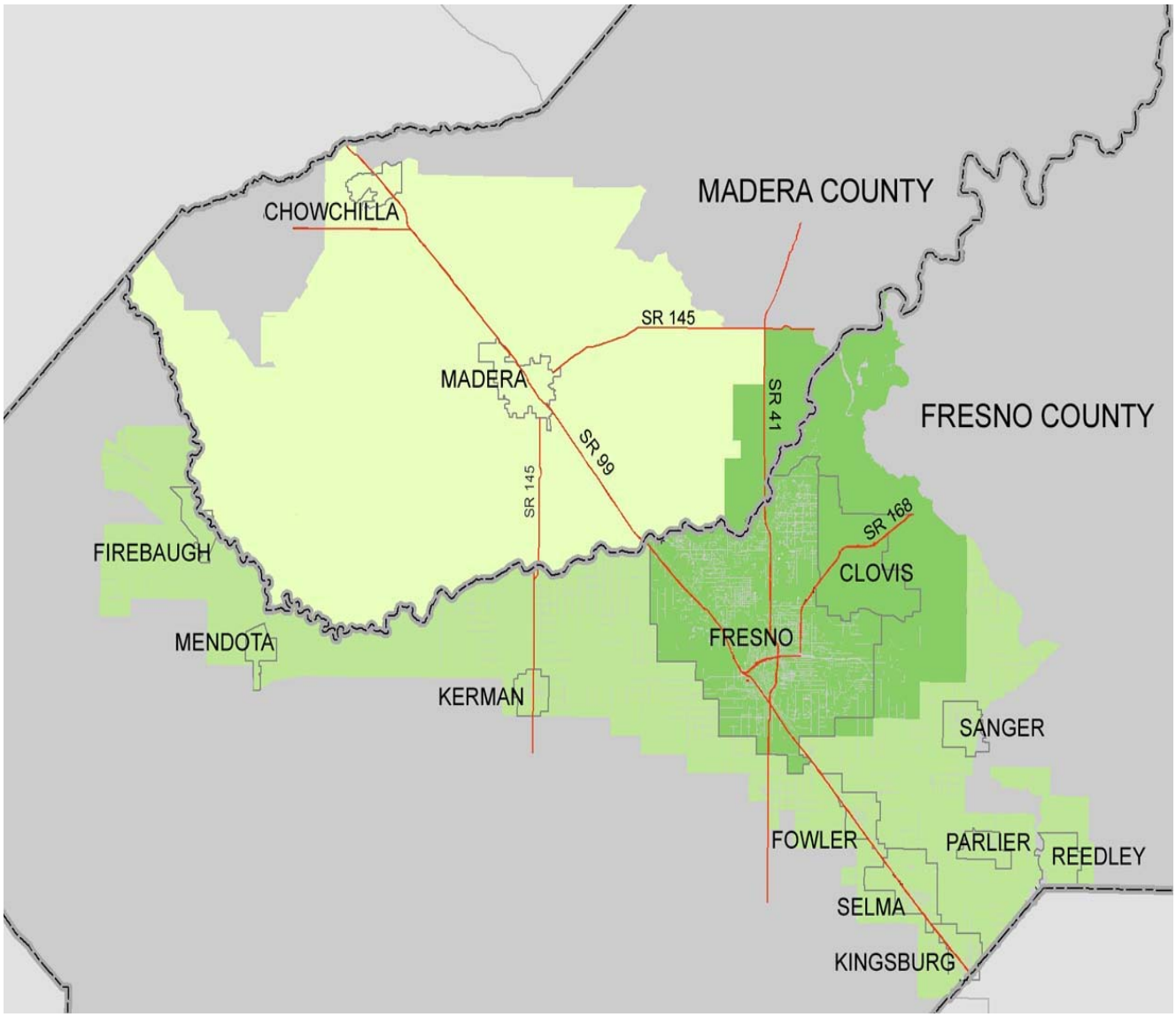
This Executive Summary provides an overview of the remaining chapters of Phase III of the San Joaquin Valley Growth Response Study (GRS), which is focused on the development of land use and transportation modeling tools for the Fresno-Madera Region or Study Area (reference Figure ES-1). The Study Area boundary was determined based upon the perceived market area for growth and development within the two counties and the availability of Geographic Information System (GIS) data.

State, regional and local agencies in the Fresno and Madera County Study Area have heard much over the years about the need to consider transportation, land use, the economy and the environment when planning for the future. The linkage between these interrelated subjects has continually been emphasized. To address this linkage, a number of new planning concepts have emerged focusing on smart growth, livable communities and sustainable growth and development. There have been a number of conferences and workshops where these concepts and practices have been discussed. Caltrans has provided the opportunity to put the concepts into action – especially given the Study Area's unique situation in the San Joaquin Valley (Valley) for the following reasons:

- The Study Area's population is going to expand significantly;
- Transportation systems in the Study Area will need to respond to that growth;
- The Study Area cannot continue to build and expand the transportation system to relieve congestion given funding issues and right-of-way constraints;
- The unique Valley environment must be protected while allowing growth and development to occur; and
- The economy depends upon the extent to which each of these outcomes can be accommodated collectively vs independently.

There have been a number of lessons learned during this Phase III demonstration project. With any quality study, there is generally a need for further investigations to clarify or expand on the findings and recommendations made in the body of work.

FIGURE ES-1
PHASE III STUDY AREA



It was found that local and regional jurisdictions need to further study certain aspects of the modeling evaluation, including but not limited to the following:

- The feasibility of the Mid-High Rise Corridor according to the development community. (It may be worth investigating if there should be less mixed use and more housing in the corridor).
- The feasibility of intensification areas and corridors identified in the study need further scrutiny.
- The feasibility of preserving corridors across the San Joaquin River for inter-county travel between Fresno and Madera.
- The feasibility of infrastructure expansion to accommodate planned development, particularly in Southeast Madera County.
- The need for Madera County to further define land uses in the new town development areas north of the San Joaquin River.

Study Purpose

The purpose of the GRS was to:

- To explore smart growth best practices and "new regionalism" opportunities
- Develop a comprehensive approach to guide growth and development within the San Joaquin Valley
- To develop the "toolbox" of land use and other models to enhance our regional planning efforts – *transportation models cannot provide all the answers*

Study Goals

The primary goals of the Study were to:

- Define the concepts of sustainable communities, livable communities and smart growth.

- Provide a baseline of information for the California Department of Transportation (Caltrans), regional, and local agencies to use in developing appropriate transportation policies and programs.

- Identify barriers for local, regional, and State agencies in responding to growth.

- Evaluate and identify appropriate tools to be used by State, regional and local agencies to determine appropriate land use, transportation, and environmental policies and plans.

Phase III Goals

The specific goals of Phase III of the Study were to:

- Create a toolbox for a large and small region within the Valley that would allow decision makers to make more informed land use decisions and to analyze potential future land use scenarios considering the linkage between land use, transportation, and the environment.

- Integrate land use, transportation, environmental, and market conditions

- Identify the potential benefits of Smart Growth concepts in terms of:
  - Costs
  - Reduced trips
  - Increased transit usage
  - Reduced air emissions
  - Increased walkability

Most importantly, the goal of Phase III of the GRS was to begin a dialogue pertaining to urban development form at the regional scale and the consideration of alternative sets of policy choices and assumptions about the future, such as alternative land uses and expansion of public infrastructure. The project includes development of a land use allocation model, and a visualization and indicator model for use with the current transportation demand models. These modeling tools will assist the Cities of Fresno, Clovis, and Madera and the Counties of Fresno and Madera in reviewing the urban landscape, considering alternative growth scenarios and their economic feasibility, and making policy changes to successfully implement their planning documents. The tools will provide information on the land use patterns that could enhance transit, reduce vehicle miles traveled, identify fiscal implications of growth and development, and address air quality issues.

Phase III also included an extensive outreach effort to involve a diverse group of stakeholders (interested transit proponents, the League of Women Voters, the Sierra Club, the business and development community, the Farm Bureau, health organizations, the San Joaquin Valley Air Pollution Control District, environmental justice groups, other advocacy groups, local elected officials, affected agency staff, and other agencies) in selecting the indicators appropriate for the models. The Stakeholders also provided input on the alternative growth scenarios to run and analyze in the models.

Why Enhance the Modeling Process?

Standard Traffic Modeling Practices are not sufficient because:

- Data is structured by Traffic Analysis Zone (TAZ)
- Projections for population, household and job growth are applied in the traffic modeling process versus actual detailed land uses
- Data by TAZ provides an inconsistent relationship to the actual land use patterns
- Traffic Model results are difficult to review with the public and decision-makers

The Phase III modeling tools will enhance the standard traffic modeling process by providing:

- Parcel or block geography consistent with census data
- Projections for population, household and job growth that are land use specific
- Land use patterns are defined using Geographic Information Systems (GIS)
- The Phase III modeling tools are easier to review with the public and decision-makers because the maps look more real and the alternatives can be painted interactively

Most importantly, the Phase III GRS modeling tools will encourage an integrated planning approach for the following reasons:

- Land use policies adopted by the local agencies can be more directly translated into model inputs such as land use type, densities, redevelopment and in-fill areas, etc.
- More clarity can be achieved using the tools in land use policies through model input requirements
- The Phase III modeling tools require a higher-level of interaction between land use and transportation planners

Overview of the Phase III Modeling Process

Figure ES-2 provides a graphic display of the Phase III modeling process. The major components of the modeling process include the following tools or models:

- **Land Use Allocation Model – WhatIf?**
  - Used to map existing and future land use & transportation patterns
  - Defines additional assumptions and directions for growth
  - Provides comprehensive & coordinated mapping of existing and future land uses
  - Develops demographic projections

- **Indicator/Visualization Model - INDEX**
  - Determines what the effects of growth will be under alternative development plans
  - Allows scenario testing — comparisons to baseline/business-as-usual conditions
  - Is a GIS-based Analysis Tool
  - Assesses Land Use & Demographic Patterns - Sample Indicators

- **Transportation Model Enhancements to TP+**
  - Enhances the Fresno/Madera Region's existing transportation and air quality models to be more "use" specific and to test various planning policies and land use alternatives
  - TP+ is most used transportation (traffic and transit) software package in the San Joaquin Valley
  - Like all models, in its current state, it is structurally insensitive to local land use features. Therefore, there is a need to enhance the models using the 4D process (Density, Design, Diversity, and Destinations) because many factors affect travel demand that are not easily reflected in traditional four-step models, e.g., due to scale of the TAZs).

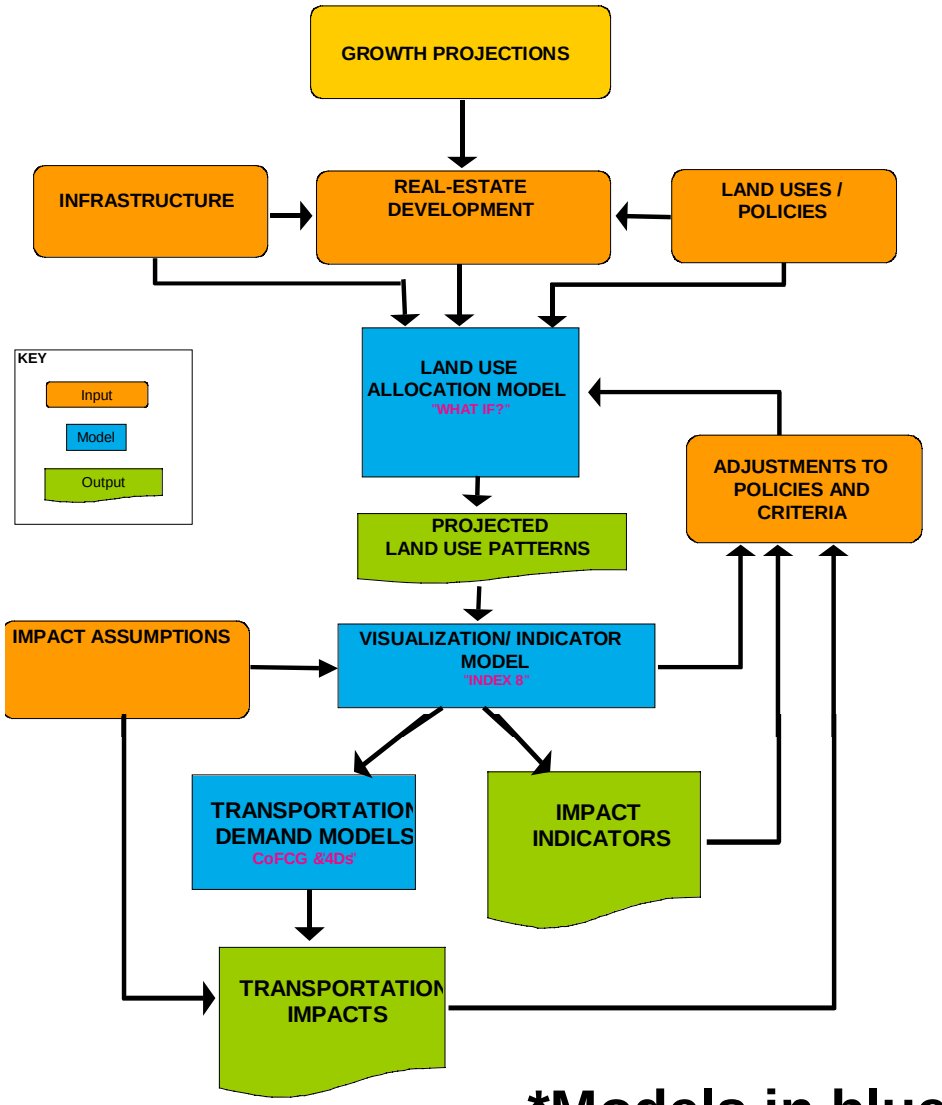
Overview of the Phase III Development Process

There were a number of steps taken by the Team to develop the GRS modeling tools. Each of these steps is highlighted below. Each step is further detailed in the following chapters of this Phase III Report.

Chapter 1- Introduction *- Describes and defines the Growth Response Study (GRS) and the need to involve stakeholders and invite them to Study Workshops over the course of the project*

Chapter 2 – Selecting the Phase III Models *– Identifies and assesses various modeling applications that may be used for purposes of the Phase III modeling process and the process applied to present findings to the stakeholders at the 1st Workshop. Figure ES-3 provides a listing of the model applications evaluated by the Study Team and highlights the models ultimately chosen.*

FIGURE ES-2
PHASE III MODELING PROCESS



***Models in blue boxes**

FIGURE ES-3
MODELS EVALUATED DURING PHASE III

Candidate Model By Model Type	1. Planning Support		2. Capability				3. Utility for COGs,			Other Key Factors for Fresno Pilot Study	Con-sultants reviewing 1-letter abbrev.
	a. Stake-holder involv-ement	b. Regional-scale model	a. Policy testing	b. Linkag e to TP+	c. Environ-mental impacts	d. GIS inter-face	a. Data needs & availability	b. Resource needs & availability	c. Succes s-ful use, esp. in CA	a. Cost, and Other Acquisition Issues	
I. LAND USE ALLOCATION MODELS											
METROSIM (12)	0	2	2	2	2	2	1	0	1	$33 to 43k plus $5-10k per year maintenance (per EPA)	E,C,L
Treas. Valley* (14)	1	2	1	2	1	2	2	2	1	Min. investment in software, but time consuming process	E,C
UPLAN (15)	1	2	2	2	2	2	2	1	1	Software free, developer may need to calibrate	E,C,L
What If? (16)	1	2	2	2	2	2	2	2	1	$3k-$8k (5 sites)	E,C
PECAS (10)**	0	2	2	2	2	2	0	0	0	Expensive, could be over $200k, and additional data needs are costly	E,C,L
II. VISUALIZATION & INDICATOR REPORTING MODELS											
PLACE^{3}S (13)	2	1	1	1	2	2	1	1+	2	Public Domain but needs support	F, Team
Web-basedPLACE^{3}S (14+)	2	2	1+	2	2	2	1+	1+	1	$40k	F, Team
Community (12)	2	1	1	0+	2	2	2	2	0	$5k	F, Team
SmartGrowthINDEX (14)	2	1	1	2	2	2	2	1	1	Public Domain but needs support	F, Team
INDEX 8 (15)	2	2	1	2	2	2	2	1	1	$4k; includes training in OR	Team
Envision QUEST (13)	2	2	2	1	2	2	1	1	0	$150k per D. Biggs, Developer	Team

Chapter 3 – Selecting the Smart Growth Modeling Indicators *- Solicit input from the local decision-makers regarding land use, environmental, and economic indicators they would like to see studied during the Phase III modeling process. The indicators chosen by the electeds and the stakeholders are listed below.*

- *Developable land remaining after new growth*
- *Acres of agriculture remaining*
- *Development Footprint (combined measurement of infill and density of population and employment)*
- *Population density*
- *Employment density*
- *Use Mix*

- *Transit Adjacency to Housing*
- *Transit Adjacency to Employment*
- *Mode split to transit*
- *Vehicle miles traveled*
- *Vehicle hours traveled*
- *Economics of Development*
- *Air pollution (NOx, HC, CO, & CO2) emitted from light vehicles*

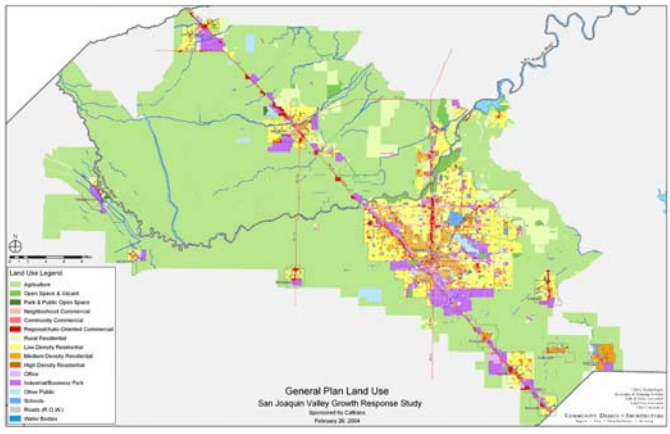
Chapter 4 – Developing the Modeling Tools *– Describes the Study Team's process to develop the existing and future (General Plan) land use data in Geographic Information System (GIS) format and the process applied to present the findings to the stakeholders at the 2nd Workshop.*

Chapter 5 – Preparing the Initial Run Scenario *– Details using the preferred set of modeling tools, analyze the Existing (2003) and future year General Plan or Initial Run scenarios, identifies alternative future year land use and transportation system scenarios and describes the process to present the findings at the 3rd Workshop. Figure ES-4 highlights results of preparing the Initial Run (General Plan) Scenario.*

FIGURE ES-4
INITIAL RUN SCENARIO RESULTS

- Initial Run City of Fresno "Build-out"

Time Period	Households	Jobs
2003	179,500	237,400
2025 Total Increment	282,400 +102,900 (37%)	399,800 +162,500 (69%)
"Build-out" Total Increment (2034)	311,900 +29,500 (10%)	496,900 +97,100 (20%)

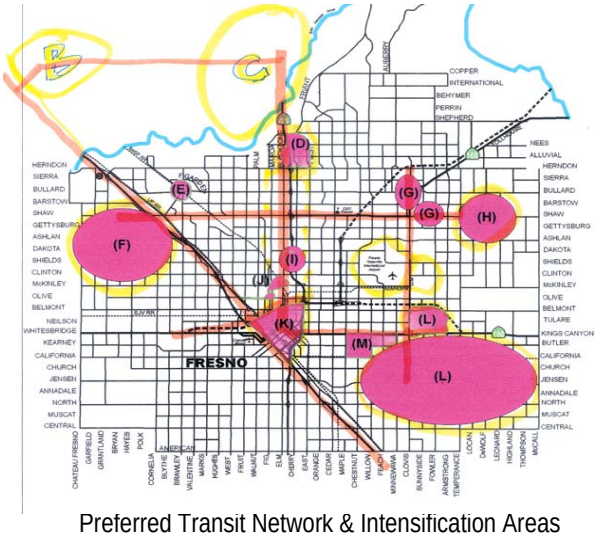


  - 25,600 additional homes needed to provide workers for all new jobs in Fresno; these are added to surrounding areas

Chapter 6 – Developing the Alternative Scenarios *– Describes using the preferred set of modeling tools, how they were applied to analyze the alternative land use and transportation scenarios, describes how the Study Team compared the indicator results to the existing condition and the Initial Run, and describes presentation of the findings to the stakeholders at the 4th and final Workshop. Figures ES-5 through 7 provide an overview of the process leading to and selecting the Alternative Scenarios. Figures ES-8 through 16 and Table ES-1 provide a summary of the various modeling results for each alternative scenario considering a few selected indicators referenced earlier.*

FIGURE ES-5
ALTERNATIVES TO THE INITIAL RUN SCENARIO

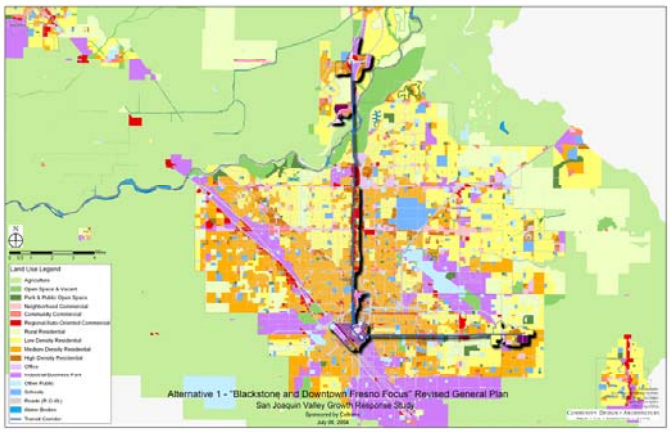
- Alternatives to the Initial Run
  - Based on Workshop #3 Polling Results
  - Preferred Network and Intensification Areas:
    - Blackstone Corridor
    - Downtown Fresno
    - Kings Canyon corridor to SE Fresno
    - SE Madera New Towns
    - Clovis Jensen to Herndon
  - Land uses with greater densities & mix than current General Plan designations
  - Connected by high capacity/high speed transit network



Preferred Transit Network & Intensification Areas
Based on Workshop #3 Input

FIGURE ES-6
ALTERNATIVE 1 – BLACKSTONE/SR 41-DOWNTOWN FRESNO SCENARIO

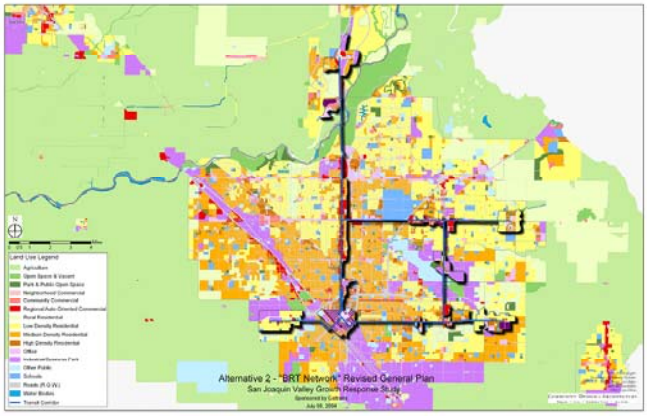
- Blackstone/41-Downtown Fresno Scenario (Alt. 1)
  - "Fixed guideway" transit routes:
    - Blackstone/41
    - Ventura/Kings Canyon
  - Intensification Areas focused on transit corridors:
    - Blackstone Corridor
    - Downtown Fresno
    - Kings Canyon corridor to Southeast Fresno
    - SE Madera New Towns



Blackstone/41 & Southeast Fresno Corridors Intensification Areas

FIGURE ES-7
ALTERNATIVE 2 – HIGH-CAPACITY TRANSIT NETWORK SCENARIO

- High-Capacity Transit Network Scenario (Alternative 2)
  - High-capacity transit mainly in dedicated lanes:
    - Blackstone/41
    - Ventura/Kings Canyon
    - Shaw - east of Blackstone
    - Clovis - Kings Canyon to Shaw
  - Intensification Areas:
    - Blackstone Corridor
    - Downtown Fresno
    - Fancher Creek & Southeast Fresno
    - Clovis Shaw Corridor & Southeast Urban Center
    - Whitesbrigde Corridor
    - Southeast Madera New Towns



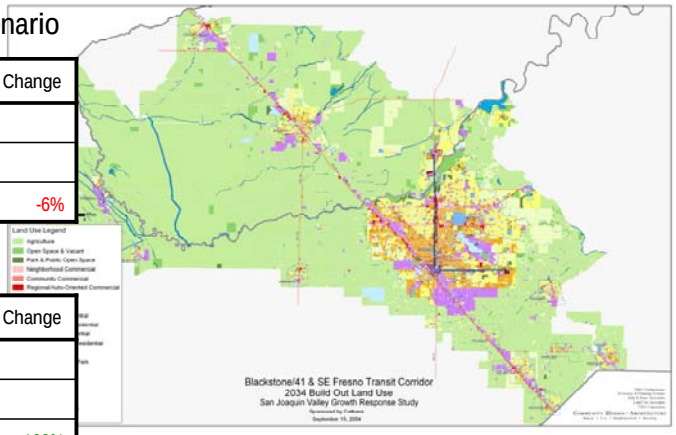
High-Capacity Transit Network and Intensification Areas

FIGURE ES-8
INITIAL RUN VS ALTERNATIVE 1 – BLACKSTONE/SR 41-DOWNTOWN FRESNO SCENARIO

- Blackstone/41-Downtown Fresno Scenario (Alt. 1) vs. Initial Run Scenario

Fresno Co.	Households	% Change	Jobs	% Change
Existing 2003	247,800		317,400	
Initial Run	450,300		678,400	
Blackstone/41	462,350	3%	639,100	-6%

Madera Co.	Households	% Change	Jobs	% Change
Existing 2003	27,100		30,700	
Initial Run	83,800		50,600	
Blackstone/41	79,400	-5%	105,550	109%



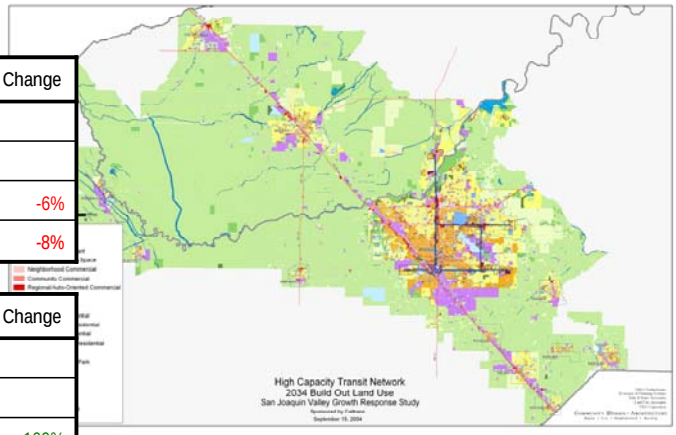
Land Use - 2034

FIGURE ES-9
INITIAL RUN VS ALTERNATIVE 2 – HIGH-CAPACITY TRANSIT NETWORK SCENARIO

- High Capacity Transit Network Scenario (Alt. 2) vs. Initial Run Scenario

Fresno Co.	Households	% Change	Jobs	% Change
Existing 2003	247,800		317,400	
Initial Run	450,300		678,400	
Blackstone/41	462,350	3%	639,100	-6%
HCT Network	440,750	-2%	622,600	-8%

Madera Co.	Households	% Change	Jobs	% Change
Existing 2003	27,100		30,700	
Initial Run	83,800		50,600	
Blackstone/41	79,400	-5%	105,550	109%
HCT Network	91,650	9%	117,120	131%



Land Use - 2034

FIGURE ES-10
POPULATION DENSITY –
INITIAL RUN VS ALTERNATIVES 1 & 2

- Alternatives 1 and 2 vs. Initial Run

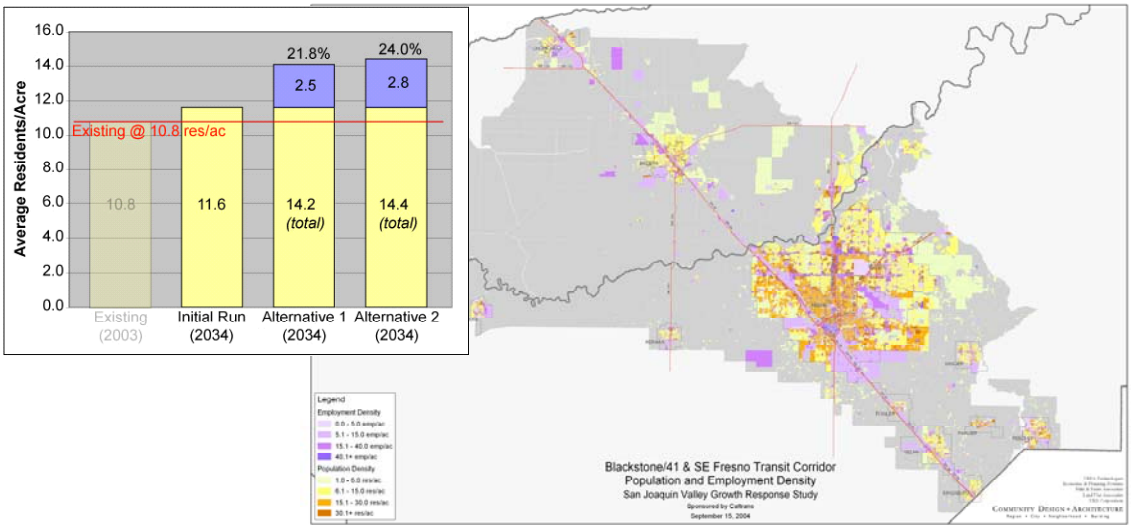


FIGURE ES-11
USE MIX –
INITIAL RUN VS ALTERNATIVES 1 & 2

- Alternatives 1 & 2 vs. Initial Run

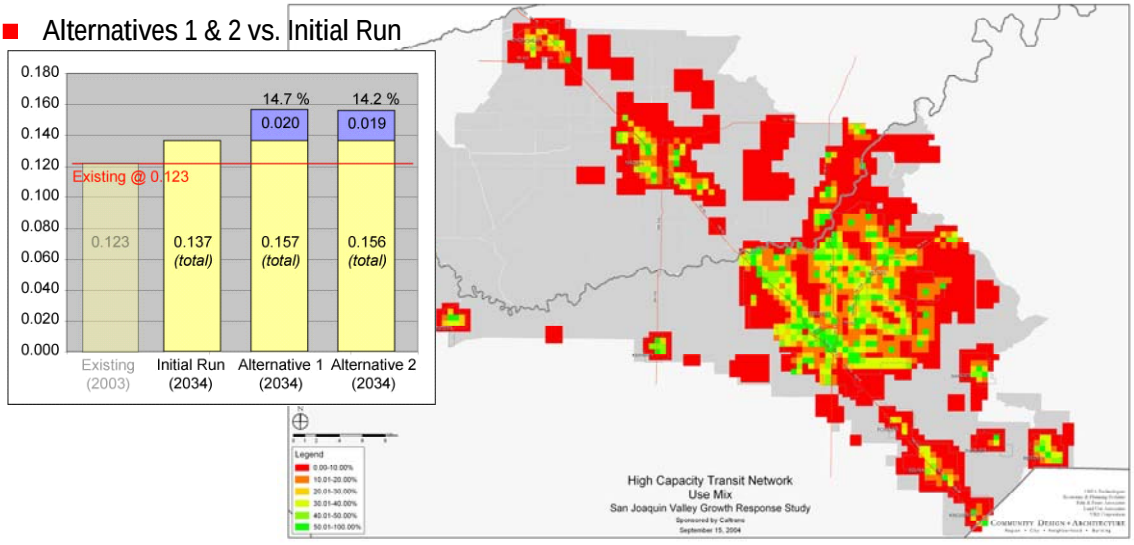


FIGURE ES-12
DEVELOPMENT FOOTPRINT – INITIAL RUN VS ALTERNATIVES 1 & 2

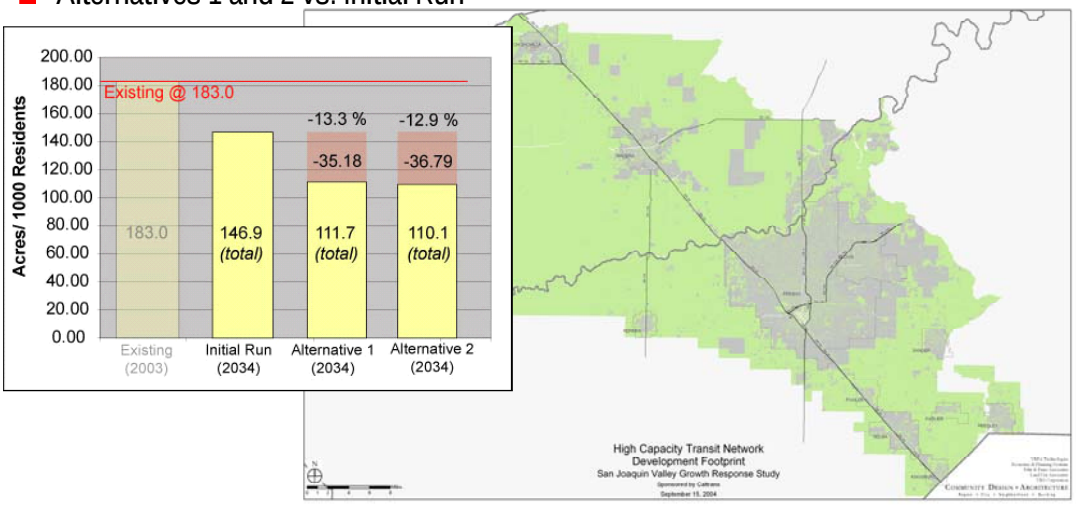


TABLE ES-1
TP+ / 4D RESULTS – INITIAL RUN VS ALTERNATIVES 1 & 2

INDICATOR:	Initial Run	Blackstone/41 (Alt 1) (vs. Initial Run)	BRT Network (Alt 2) (vs. Initial Run)
Vehicle Trips:	5,483,000	-2.0 %	-4.1 %
Vehicle miles:	45,139,000	-3.0 %	-3.6 %
Peak Auto Speeds			
--Fresno Roads:	18 mph	17 mph (-5.5%)	19 mph (+5.5%)
--Madera Roads:	28 mph	24 mph (-14.3%)	24 mph (-14.3%)
Transit Mode Split:	1.1 %	1.6% (+45 %)	1.6% (+45 %)

Summary Results:

- ***Blackstone/41 (Alternative 1) Scenario - The concentration of intensification zones in the SR 41 corridor increases opportunities to walk and use transit, but also increases vehicular traffic and congestion in this corridor.***
- ***BRT Network (Alternative 2) Scenario - Wider dispersal of intensification zones in SR 41 corridor reduces vehicular traffic and congestion in the intensification areas.***

FIGURE ES-13
TP+ / 4D RESULTS –DAILY TRANSPORTATION COSTS
INITIAL RUN VS ALTERNATIVES 1 & 2

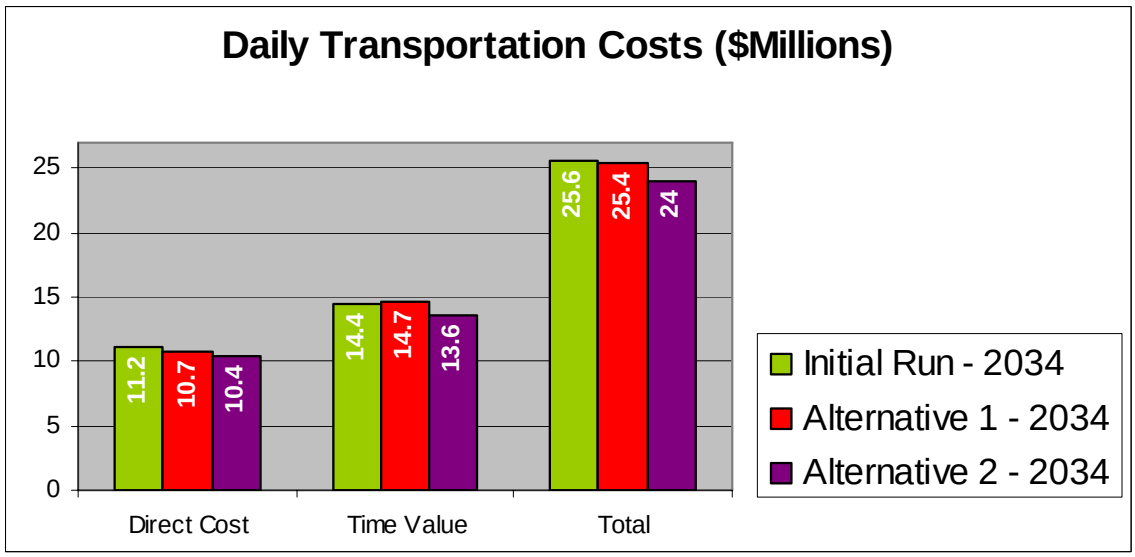


FIGURE ES-14
TP+ / 4D RESULTS –RELATIVE INFRASTRUCTURE COSTS
INITIAL RUN VS ALTERNATIVES 1 & 2

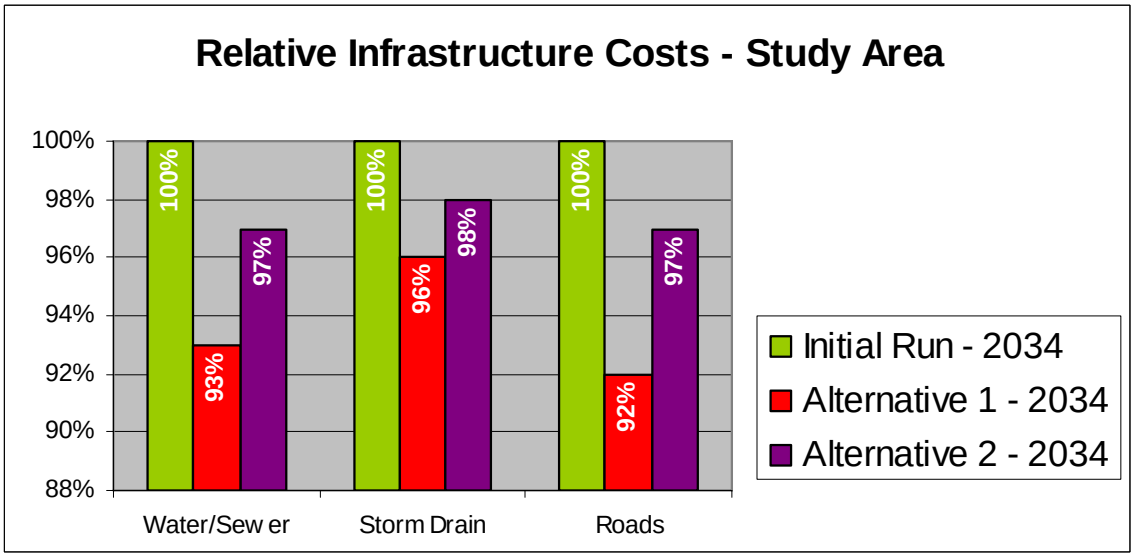


FIGURE ES-15
TP+ / 4D RESULTS –AIR QUALITY IMPACTS - ROG
INITIAL RUN VS ALTERNATIVES 1 & 2

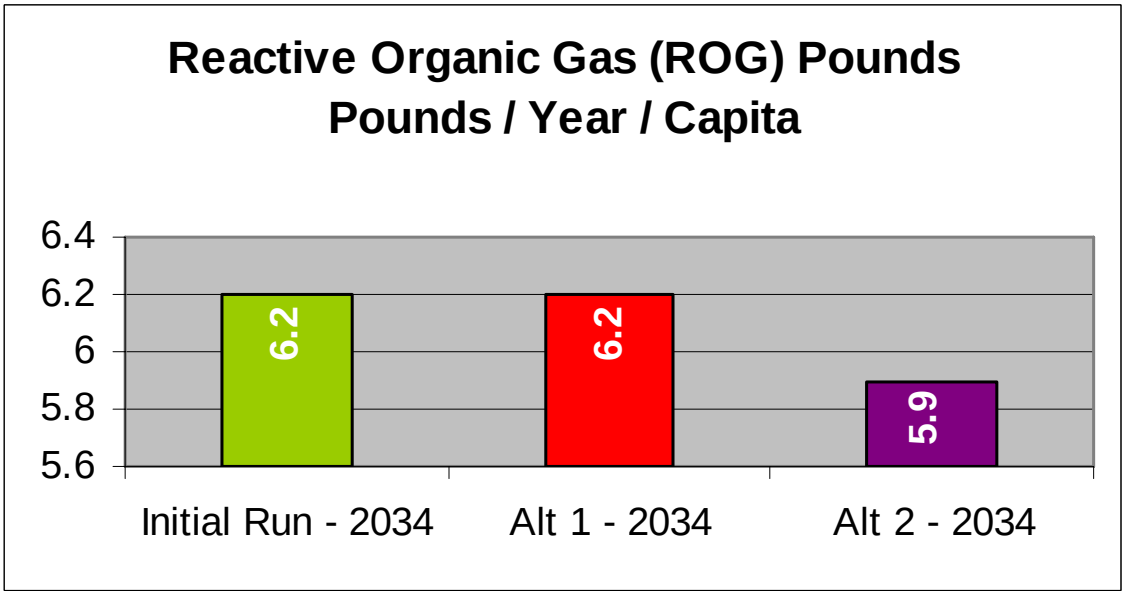
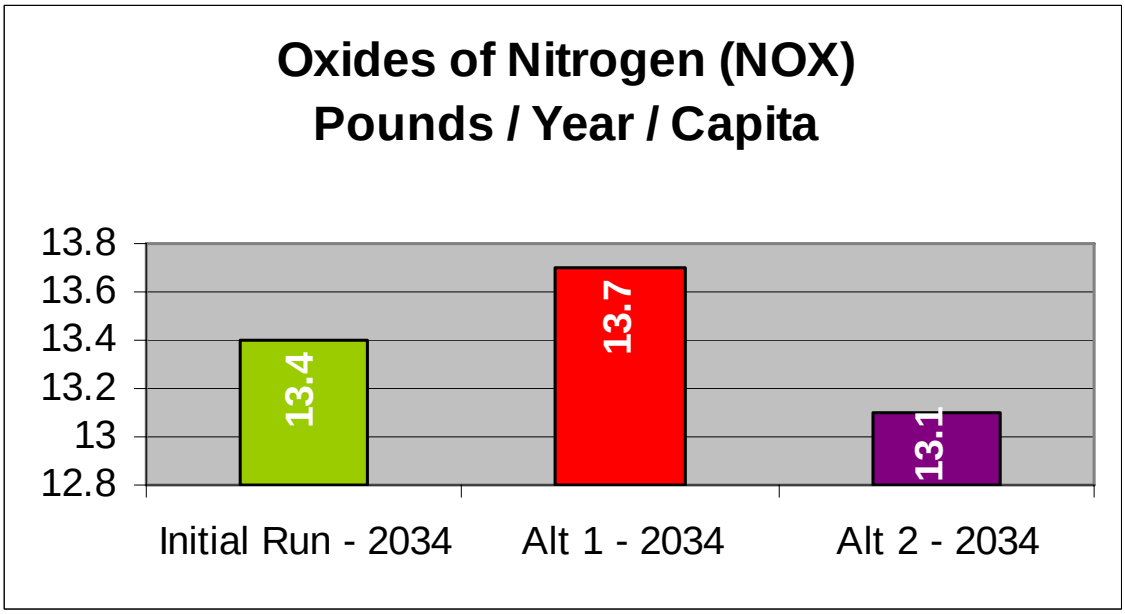


FIGURE ES-16
TP+ / 4D RESULTS –AIR QUALITY IMPACTS - NOX
INITIAL RUN VS ALTERNATIVES 1 & 2



Chapter 7 - Tool Box Issues, Recommendations, and Conclusions *– Provides a list of issues discussed during the Workshops and during presentations to the elected bodies and other groups, identifies recommendations to address the issues and findings of the Phase III Study, and provides conclusions regarding the modeling tools applied for purposes of the Phase III process.*

Chapter 8 – Tool Box Training, Presentation to the County Modeling Groups, and Next Steps *– Discusses the model training sessions already conducted during the Study, describes the need for meetings with Fresno COG and the Madera County Transportation Commission (MCTC) to review the modeling tools and present the final Study to the modeling groups in both counties, and discusses the next steps – where do we go from here?*

Chapter 9 – Presentation of the Final Phase III Study and Tool Box *– Describes the process of presenting the final set of tools and Study findings to the various City Councils and Boards of Supervisors within the Study Area.*