StanCOG
Stanislaus Council Of Governments

City of Ceres • City of Hughson • City of Modesto • City of Newman • City of Oakdale • City of Patterson
City of Riverbank • City of Turlock • City of Waterford • County of Stanislaus

NEXT MEETING OF THE:

SUSTAINABLE COMMUNITIES STRATEGY STEERING COMMITTEE
JANUARY 31, 2012•TUESDAY•1:00 PM
STANCOG BOARD ROOM
1111 I STREET, SUITE 308
MODESTO, CA

Committee Agendas and Minutes: Committee agendas, minutes and copies of items to be considered by the StanCOG Committees are available at least 72 hours prior to the meeting at the StanCOG offices located at 1111 "I" Street, Suite 308, Modesto, CA during normal business hours. The documents are also available on StanCOG's website at www.stancog.org/committees.shtm.

Materials related to an item on this Agenda submitted to the Committee after distribution of the agenda packet are available for public inspection at the address listed above during normal business hours. These documents are also available on StanCOG's website, subject to staff's ability to post the documents before the meeting.

Public Comment Period: Matters under the jurisdiction of the Committee, and not on the posted agenda, may be addressed by the general public at the beginning of the regular agenda and any off-agenda matters before the Committee for consideration. However, California law prohibits the Committee from taking action on any matter which is not on the posted agenda unless it is determined to be an emergency by the Committee. Any member of the public wishing to address the Committee during the "Public Comment" period will be limited to 5 minutes unless the Chair of the Committee grants a longer period of time. At a Special Meeting, members of the public may address the Board on any item on the Agenda at the time the item is considered by the Board.

Public Participation on a Matter on the Agenda: Please step to the podium at the time the agenda item is announced by the Chairperson. In order to ensure that interested parties have an opportunity to speak, any person addressing the Committee will be limited to a maximum of 5 minutes unless the Chair of the Committee grants a longer period of time.

Reasonable Accommodations: This Agenda shall be made available upon request in appropriate alternative formats to persons with a disability, as required by the Americans with Disabilities Act of 1990 (42 U.S.C. § 12132) and the Ralph M. Brown Act (California Government Code § 54954.2). Persons requesting a disability related modification or accommodation in order to participate in the meeting should contact Cindy Malekos at (209) 525-4600 during regular business hours at least 72 hours prior to the time of the meeting to enable StanCOG to make reasonable arrangements to ensure accessibility to this meeting.

Notice Regarding Non-English Speakers: StanCOG Committee meetings are conducted in English and translations to other languages is not provided. Anyone wishing to address the Committee is advised to have an interpreter or to contact Cindy Malekos at (209) 525-4600 during regular business hours at least 72 hours prior to the time of the meeting so that StanCOG can provide an interpreter.

Aviso con Respecto a Personas que no Hablan el Idioma de Inglés: Las reuniónes del los Comités del Consejo de Gobiernos de Stanislaus son conducidas en Inglés y traducciones a otros idiomas no son disponibles. Cualquier persona que desea dirigirse al Comité se le aconseja que traiga su propio intérprete o llame a Cindy Malekos al (209) 525-4600 durante horas de oficina regulares o a lo menos 72 horas antes de la reunión del Consejo de Gobiernos de Stanislaus, para proporcionarle con un intérprete.

AGENDA

1. **CALL TO ORDER**

2. **ROLL CALL**

3. **PUBLIC COMMENTS**
   These matters may be presented only by interested persons in the audience. Discussion is limited to five minutes or at the discretion of the Chair.

4. CONSENT CALENDAR

A. Motion to Approve Sustainable Communities Strategy (SCS) Steering Committee Minutes of 1/3/2012

5. DISCUSSION/ACTION ITEMS

A. Discussion regarding Draft Demographic Forecast Report

B. Discussion regarding Draft SCS 'Roadmap'

6. INFORMATION ITEMS

A. SCAG and SACOG Draft Sustainable Communities Strategy

B. Housing Market Demand Analysis Update

C. Report: Impact of Residential Growth Patterns on VMT and Pollutant Emissions, The Journal of Transport and Land Use

D. Future Meeting Topics

7. ADJOURNMENT

Next Regularly Scheduled Sustainable Communities Committee Meeting:
March 6, 2012 (Tuesday) @ 1:00 pm
StanCOG Board Room
1111 I Street, Suite 308
Modesto, CA 95354

CONSENT CALENDAR

Item 4A

City of Ceres • City of Hughson • City of Modesto • City of Newman • City of Oakdale • City of Patterson
City of Riverbank • City of Turlock • City of Waterford • County of Stanislaus

SUSTAINABLE COMMUNITIES STRATEGY (SCS) MEETING
StanCOG Board Room
1111 I Street, Suite 308
Modesto, CA

Minutes of January 3, 2012 (Tuesday)
1:00 pm

MEMBERS PRESENT: Kirk Ford (Stanislaus County); Tom Westbrook (City of Ceres); Brad Wall (City of Modesto); Joel Andrews (City of Patterson); Debbie Whitmore (City of Turlock); Bob Borchard (City of Waterford); Marjorie Blom (LAFCo); Mayor Virginia Madueno (Policy Board Representative); RJ Corwin (BPAC Representative); Jean Foletta (SSTAC)

ALSO PRESENT: Vince Harris, Carlos Yamzon, Cindy Malekos, Jaylen French, Mike Costa (StanCOG); Kay Dunkle (City of Ceres)

1. **CALL TO ORDER**
Jaylen French called the Sustainable Communities Strategy (SCS) Steering Committee meeting to order at 1:05 pm.

2. **ROLL CALL**

3. **PUBLIC COMMENTS - None**

4. **CONSENT CALENDAR**

A. **Motion to Approve Sustainable Communities Strategies (SCS) Steering Committee Minutes of 11/29/2011**

***By Motion (Debbie Whitmore/Jean Foletta),** and unanimous vote, the Sustainable Communities Strategy Steering Committee approved the Minutes from the December Steering Committee Meeting.

5. **DISCUSSION/ACTION ITEMS**

A. **Discussion regarding SCS Scenario Development and Performance Indicators**
Staff provided an overview of the staff report and kicked-off the discussion regarding developing scenarios for the SCS and adopting Performance Indicators to help evaluate each scenario. Staff stated that the Committee will need to narrow down the five proposed scenario options that were agreed-upon in March 2011. Staff introduced an internal-use-only map that

depicts land uses across the entire region. The map can be made available once approved by the local agencies. This map will be used as foundational information for the SCS development process to help create scenarios.

B. Discussion regarding Envision Tomorrow, Scenario Sketch Planning Tool

Staff provided an introduction of the sketch planning tool, Envision Tomorrow. It is staff's intent to secure a contract with the planning firm who developed this software, Fregonese and Associates, to have it installed and to train staff to use the tool. Staff then provided an outline of the process undertaken to create and evaluate scenarios within the sketch planning tool. The Tool is primarily a land use tool, but outputs can be incorporated into the transportation model. Staff also provide information on the link between the sketch planning tool and the transportation model. Staff then answered questions about how StanCOG would use the tool. There was discussion regarding how to develop the scenarios, what tools to use, what information sources to research, etc. The Committee supported the investment to obtain the sketch planning tool.

C. Discussion regarding San Joaquin Valley Network's Sustainable Communities Strategy Resolution

This item was taken as the first Discussion/Action Item (before Item 5A and 5B).

StanCOG staff provided a lead in to the resolution and introduced Mayor Madueno. Mayor Madueno presented the Resolution to the Committee. Mayor Madueno has worked with a broad group of interests to prepare a Resolution to garner a broad base of support and to create a stronger awareness of the SCS. Mayor Madueno will seek approval of the resolution by the three major cities in the valley (City of Modesto, City of Stockton and City of Fresno). It will then be brought to the COG Director's Group and to the San Joaquin Valley Policy Council, then on to the smaller agencies throughout the Valley.

6. INFORMATION ITEMS

A. SANDAG Sustainable Communities Strategy and StanCOG RTP Executive Summary

Staff provided a copy of the first SCS adopted in the state from the San Diego Association of Governments (SANDAG) and a copy of the StanCOG Regional Transportation Plan (RTP) Executive Summary to the Committee. It is staff's intent to provide a view of the final product of the SCS so that committee members can become familiar with it and also to provide some context to the SCS process by providing a copy of the RTP Executive Summary.

B. California Strategic Growth Council Strategic Plan Public Review

Staff stated that the California Strategic Growth Council has released their Strategic Plan for public review. A Committee member stated that local planning staff should provide comments as it relates to California Housing and Community Development (HCD) and the Regional Housing Needs Assessment (RHNA) process, especially in regards to receiving credit for infill development in needs allocations.

C. REVISED Meeting Schedule for Calendar Year 2012

Staff provided this revised schedule as an information item. No discussion occurred.

D. Future Meeting Topics

StanCOG Staff informed the group of topics to be addressed at future meetings. This will be a standing item on each agenda to notify the committee of upcoming topics.

7. ADJOURNMENT

Jaylen French adjourned the Sustainable Communities Strategy (SCS) Steering Committee meeting at 2:26 pm.

Next Regularly Scheduled Sustainable Communities Strategy Steering Committee Meeting:
January 31, 2012 (Tuesday) @ 1:00 pm
StanCOG Board Room
1111 I Street, Suite 308
Modesto, CA 95354

Minutes Prepared By:

Jaylen French
Associate Planner / SCS Project Manager

DISCUSSION & ACTION ITEMS

StanCOG
Stanislaus Council Of Governments

Item 5A

City of Ceres • City of Hughson • City of Modesto • City of Newman • City of Oakdale • City of Patterson
City of Riverbank • City of Turlock • City of Waterford • County of Stanislaus

TO: Sustainable Communities Strategy Steering Committee — **Staff Report** Discussion

THROUGH: Vince Harris, Executive Director

FROM: Carlos Yamzon, Senior Regional Planner CY
Jaylen French, Associate Planner JF

DATE: January 23, 2012

SUBJECT: Discussion regarding Draft Demographic Forecast Report

---

Background

As part of the San Joaquin Valley Blueprint effort (and grant funding), the eight Valley Metropolitan Planning Organizations have commissioned a Demographic Forecast Report, which takes a fresh look at the growth assumptions in the region and incorporates the latest state and federal demographic information, including the 2010 Census.

Staff has previously provided information to the Steering Committee on the development of this report in Committee agenda packages. In November, Staff provided information on the intent of the contract and the consultant selection process and in December, Staff provided information on the approach the consultant developed to prepare the Report. Subsequent to the preparation of this Staff Report, the retained consultant firm, DCE | The Planning Center, released the Draft Report. Staff will provide the draft report to each committee member once it has been received.

In the meantime, the three key projections (in 5-year increments) are presented in the table below.

Year	Total Population	Total Jobs	Total Households
2010	514,500	158,500	165,200
2015	544,700	169,200	176,500
2020	584,300	179,900	188,400
2025	623,300	190,700	199,800
2030	662,300	201,400	211,000
2035	701,200	212,100	223,000
2040	740,000	222,800	234,000

By comparison, the 2011 RTP projected the figures for 2035 population and employment that were approximately 9.5% and 13.6% higher respectively than this forecast. See the table below.

Year	Total Population	% Diff.	Total Jobs	% Diff.
2035	767,800	- 9.5%	253,300	- 13.6%

Discussion

For each RTP StanCOG staff must prepare a growth forecast, which projects growth of the population and employment to determine the future travel and housing needs of the region. Previous growth forecasts were prepared during the housing boom or at the beginning of the bust-cycle and the subsequent recession. Consequently, population growth in the region has slowed. Also, the 2010 Census was recently completed, which provides the most comprehensive demographic numbers available. Therefore, this is a great opportunity to prepare an accurate growth forecast for the RTP/SCS process.

Staff is seeking SCS Steering Committee input regarding the projections. Subsequently, the Committee should approve this or a revised forecast. The forecast will ultimately be adopted by the StanCOG Policy Board for use in the RTP/SCS process.

jcfrench@stancog.org

StanCOG
Stanislaus Council Of Governments

Item 5B

City of Ceres • City of Hughson • City of Modesto • City of Newman • City of Oakdale • City of Patterson
City of Riverbank • City of Turlock • City of Waterford • County of Stanislaus

TO: Sustainable Communities Strategy Steering Committee

Staff Report
Discussion

THROUGH: Vince Harris, Executive Director

FROM: Carlos Yamzon, Senior Regional Planner CY
Jaylen French, Associate Planner JCF

DATE: January 23, 2012

SUBJECT: Discussion regarding Draft SCS Roadmap

Discussion

Staff has prepared a document which highlights the key steps (or tasks) to be undertaken as part of the RTP/SCS development process; we have named this document the SCS Roadmap. Staff believes the Roadmap, which is intended as a guide for the development of the SCS--to be used by Staff, SCS Committee members, other interested parties and the public--will provide a clearer picture of the path the SCS development process is on.

The Roadmap should be used in tandem with the SCS Schedule which was developed in October 2011. The Roadmap simply outlines the major efforts to complete a SCS per the requirements of SB 375.

At the February SCS Committee meeting, Staff will go over the Roadmap with the Committee and accept comments on the Draft.

jcfrench@stancog.org

DRAFT SCS ROADMAP

Stanislaus Council of Governments, February 2012

Establish Plan Principles and Goals

Create a vision and determine desired results of the RTP/SCS Plan by establishing a set of Principles and related Goals.

Recommended Principles: System Planning, Fiscal Constraint and Sustainability

The RTP is first and foremost a transportation plan and investment strategy; therefore, Staff proposes to continue to use the foundational concepts (principles) from the 2011 RTP - System Planning and Fiscal Constraint. However, with the passage of SB 375, staff proposes a new principle, Sustainability.

Recommended Goals: 1. Mobility, 2. Safety and Health, 3. Community Vitality, 4. Economic Vitality, 5. Environmental Quality, 6. Social Equity, 7. Smart Land Use, and 8. System Preservation

Based on the 2011 RTP, SB 375 requirements and several discussions with the SCS Steering Committee, Staff proposes the goals above, which relate to the proposed RTP/SCS Principles.

Once discussed and approved by the SCS Steering Committee, Staff will present the proposed RTP/SCS Principles and Goals to the public at the upcoming Public Workshops to gather public input.

Develop Regional Growth Forecast

Project growth in population, jobs and housing units to determine the future travel and housing needs of the region.

Any planning effort depends heavily on an accurate forecast for future growth in population and employment. This is especially true with the requirement of SCB 375 to coordinate land use and transportation planning.

As part of the San Joaquin Valley Blueprint effort, the eight Valley MPOs have commissioned a Demographic Forecast Report which takes a fresh look at the growth assumptions in this region and incorporates the latest state and federal demographic information, including the 2010 Census.

Develop Land Use Forecast

Utilizing the latest growth forecast, prepare a land use pattern to accommodate the estimated increases in population, employment and housing.

Not only must the RTP accommodate the future travel needs of the increased population, the SCS must 'Identify areas within the region sufficient to house all the population of the region, including all economic segments of the population, over the course of the planning period...' and 'Identify areas within the region sufficient to house an 8-year projection of the regional housing need for the region'. In addition, to the listed requirements, the SCS land use pattern will be developed (based on the latest planning assumptions) to help achieve the goals of the plan.

Develop Revenue Forecast

Project reasonable future transportation-related revenues to determine available funds to improve the transportation system.

One of the proposed principles of the RTP/SCS is fiscal constraint. In this region, which historically does not receive its fair-share of revenues and at this time in history, fiscal constraint is especially important. To plan accurately we must project revenues realistically so that we can focus each dollar on the most pressing needs.

Develop Project List

Coordinate with the member agencies to develop a RTP Project List, based on available transportation funds.

StanCOG will develop a RTP project list which will improve the overall transportation system by meeting the goals of the RTP/SCS; which will be coordinated with the land uses to improve the overall quality of life in the region and further meet the goals of the RTP/SCS; which will ensure the region meets air quality conformity; and which will ensure fiscal constraint.

Create Land Use Scenarios

Create land use scenarios to better analyze a variety of land use patterns and their transportation implications.

StanCOG will create 3-4 scenarios that will explore and clearly convey the impact of where the region grows over the next 25-years (to what extent growth is focused on infill and compact design); and how it grows (the shape and style of the neighborhoods and transportation systems that will shape growth over the life of the plan).

Integrate Transportation System with Land Uses

Coordinate transportation system investments with the land use plan

The likely reduced growth and revenues forecasted for the region will necessitate a more limited package of transportation projects. As a result certain projects from the 2011 RTP may not be included in this RTP/SCS. A focus should be made to identify transportation investments that achieve high cost-effectiveness and strong performance benefits. Transportation investments, especially to transit, should be coordinated with the proposed land use pattern to maximize the cost-effectiveness and general performance of each project. As part of this task, StanCOG will develop a 'Smart Growth Concept Map' that will link land use and transportation planning.

Develop RTP/SCS

Prepare a long-range vision and investment strategy for the region's transportation system and prepare an enhanced land-use element with associated policies that could help guide future land use and transportation planning.

It is important to note that even though StanCOG will develop a land use map and recommendations for new growth, the decisions on when, where and how to develop lie solely with the local jurisdictions.

INFORMATION ITEMS

StanCOG
Stanislaus Council Of Governments

Item 6A

City of Ceres • City of Hughson • City of Modesto • City of Newman • City of Oakdale • City of Patterson
City of Riverbank • City of Turlock • City of Waterford • County of Stanislaus

TO: Sustainable Communities Strategy Steering Committee

Staff Report
Information

THROUGH: Vince Harris, Executive Director

FROM: Carlos Yamzon, Senior Regional Planner CY
Jaylen French, Associate Planner JCF

DATE: January 23, 2012

SUBJECT: SCAG and SACOG Draft Sustainable Communities Strategy

---

Discussion

Recently, the Southern California Association of Governments (SCAG) and the Sacramento Area Council of Governments (SACOG) have released Draft Sustainable Communities Strategies. Attached for your use are links to each of these documents.

SCAG
http://rtpscs.scag.ca.gov/Documents/2012/draft/2012dRTP_04_SCS.pdf

SACOG
http://www.sacog.org/2035/files/Draft-mtpscs/MTP%20SCS%20COMPLETE%2011-10-11.pdf

At the February SCS Committee meeting, Staff will provide verbal highlights of each of these plans.

jcfrench@stancog.org

StanCOG
Stanislaus Council Of Governments

Item 6B

City of Ceres • City of Hughson • City of Modesto • City of Newman • City of Oakdale • City of Patterson
City of Riverbank • City of Turlock • City of Waterford • County of Stanislaus

TO: Sustainable Communities Strategy Steering Committee

Staff Report
Information

THROUGH: Vince Harris, Executive Director

FROM: Carlos Yamzon, Senior Regional Planner CY
Jaylen French, Associate Planner JF

DATE: January 23, 2012

SUBJECT: Housing Market Demand Analysis Update

Background

On October 17, 2011, Fresno COG, on behalf of the eight San Joaquin Valley Regional Planning Agencies, released a RFP for consultation services to determine the need and market demand for higher density residential housing types throughout the San Joaquin Valley. This is a follow-up report to the Demographic Forecast, which also uses fourth year Blueprint grant funds.

A total of $25,000 has been budgeted for the project, with a proposed contract period of February 13, 2012 through May 31, 2012. The submittal deadline for proposals was December 2, 2011. Three proposals were received in response to the RFP.

Discussion

A selection committee including representatives selected by all eight MPOs (including local agency representatives and COG staff) as well as representatives from the building, real estate and banking industries reviewed the proposals and submitted their feedback. Interviews with two of the firms were scheduled for Thursday, January 5, 2012. Based upon review of the proposals and the interviews, the selection committee recommended the Concord Group be awarded the contract. While FresnoCOG will act as project manager for this project, all eight of the Valley MPOs will continue to be involved throughout the project period.

The report is intended to determine the need and market demand for higher-density housing, which, depending on the results, could assist decision-makers looking to implement Blueprint principles. The Report could also aid the development of the SCS process, which will likely seek to create a more compact land use pattern to attempt to lower greenhouse gas (GHG) emissions.

jcfrench@stancog.org

StanCOG
Stanislaus Council Of Governments

Item 6C

City of Ceres • City of Hughson • City of Modesto • City of Newman • City of Oakdale • City of Patterson
City of Riverbank • City of Turlock • City of Waterford • County of Stanislaus

TO: Sustainable Communities Strategy Steering Committee — **Staff Report** Information

THROUGH: Vince Harris, Executive Director

FROM: Carlos Yamzon, Senior Regional Planner CY
Jaylen French, Associate Planner JF

DATE: January 23, 2012

SUBJECT: Report: Impact of Residential Growth Patterns on VMT and Pollutant Emissions, The Journal of Transport and Land Use

---

Background

This report seeks to better understand how land use-transportation interactions influence the production of mobile source emissions through an assessment of the impacts of different long-term residential growth patterns on VMT. The report was provided by Committee member Mayor Virginia Madueno.

Discussion

Staff has provided a copy of the report for any committee member who wishes to review it. At the February SCS Committee meeting, Staff will provide a synopsis of the report, focusing on the key elements and the conclusions.

jcfrench@stancog.org

THE JOURNAL OF TRANSPORT AND LAND USE http://jtlu.org
VOL. 4 NO. 3 [Fall 2011] pp. 65–80 doi: 10.5198/jtlu.v4i3.226

JTLU

The impact of residential growth patterns on vehicle travel and pollutant emissions

Deb Niemeier
University of California, Davis [a]

Song Bai
University of California, Davis [b]

Susan Handy
University of California, Davis [c]

Abstract: In light of the increasing reliance on compact growth as a fundamental strategy for reducing vehicle emissions, it is important to better understand how land use-transportation interactions influence the production of mobile source emissions. To date, research findings have produced mixed conclusions as to whether compact development as a strategy for accommodating urban growth significantly reduces vehicle travel and, by extension, mitigates environmental impacts, particularly in the area of air quality. Using an integrated simulation approach coupled with long-term land development scenarios, we conducted an assessment of the impacts of different long-term primarily residential growth patterns on vehicle travel and pollutant emissions in the eight counties of the San Joaquin Valley region in central California. The results suggest that higher residential densities result in slightly decreased regional vehicle travel and emissions. Our comparative analysis also suggests that the effects of future land use growth patterns may vary among different spatial areas. That is, compact growth strategies can result in significantly more travel and emissions changes in already fairly urbanized counties. This work indicates a minimum density threshold of approximately 1500 households per square mile is necessary to achieve commensurate emissions reductions relative to existing densities.

Keywords: Planning; Residential density; VMT; Air quality

1 Introduction

Linking land use, transportation, and air quality has become an increasingly critical need in contemporary urban planning. In particular, a better understanding of the effects on travel activity and vehicle emissions of land use strategies and growth management policies that prioritize compact development is critical for facilitating effective long-term planning decisions. However, the land use-transportation interaction is complicated. To date, research has produced mixed conclusions as to whether compact development as a strategy for accommodating urban growth significantly reduces vehicle travel (e.g. Badoe and Miller 2000) and, by extension, mitigates environmental impacts, particularly in the area of air quality. For example, some studies have found that higher residential densities are typically associated with lower regional per capita travel (Ewing and Cervero 2001; Ewing *et al.* 2002; Golob and Brownstone 2005), shorter trip length (Cervero 1996), lower vehicle trip rates (Cervero and Kockelman 1997; Ewing and Cervero 2001), and higher non-auto mode splits (Dunphy and Fisher 1996; Ewing *et al.* 2002). Other studies have suggested that the relationship between density and travel activity is unclear, or that there are no direct effects (e.g. Kockelman 1997; Miller and Ibrahim 1998; Pickrell 1999).

Extending our understanding of how changes in land use and VMT affect air quality is also problematic because the relationship between air quality effects and vehicle travel is nonlinear. There is some evidence that emissions per household for criteria pollutants, those air pollutants regulated by the U.S. Environmental Protection Agency, are slightly negatively correlated with household density (Frank *et al.* 2000), in particular when smart growth in redevelopment and infill areas is compared to imbalanced or dispersed growth (Liu 2003). A recent review of scenario-based long-term planning exercises from more than 50 different metropolitan areas indicated a median reduction of roughly two percent in vehicle miles traveled and nitrous oxides emitted had resulted from an 11 percent increase in density over trend conditions (Bartholomew 2007). These findings are not out of range with those produced from another study using travel forecasting and scenarios, which found a reduction of approximately five to six percent in vehicle emissions as a result of an approximately 10 percent increase in population density (Stone *et al.* 2007).

[a] Professor, Dept. of Civil and Environmental Engineering. dnniemeier@ucdavis.edu.
[b] Postdoctoral scholar, Dept. of Civil and Environmental Engineering.
[c] Professor, Dept. of Environmental Science and Policy.

One of the major problems in connecting changes in land use and vehicle travel to air quality impacts is that it is usually difficult to translate changes in one or the other directly into vehicle emissions reductions (Louis Berger Group 2004). Handy (1996) noted that the methods used to study the relationships between land use and transportation have traditionally fallen into two categories: empirical studies and studies relying on travel forecasting simulation methods. One limitation of the empirical land use-transportation studies, regardless of whether the approach is aggregate or disaggregate, is that the mobile source estimation is delinked from any actual (or simulated) travel conditions or network, and must usually be derived using averages. The emissions-speed curves for most pollutants are generally parabolic and therefore changes in speed can create significant changes in emissions. Conversely, studies based on simulation have an advantage in that travel speeds can be attached to an actual network, although traditional travel demand models are not always well-linked to relevant policy questions. The simulation approaches, though dependent on the quality of the models used, offer the potential to explore the effects of development pattern scenarios as a way of examining alternative futures.

In this study, we use an integrated modeling framework to examine future mobile-source air pollutant emissions under a variety of long-term growth scenarios in the San Joaquin Valley (SJV) in central California. The San Joaquin Valley currently experiences severe air pollution problems, with all the concomitant emissions control challenges associated with population expansion, which has in turn driven changes in transportation, industry, agriculture, and power generation (Hall *et al.* 2006). Over the next 30 years, the population of California is expected to grow by 15 million, with roughly 25 percent of that growth occurring in the SJV (California Department of Finance 2007). Where this growth goes and how it is placed within the context of the cityscape are vitally important to achieving many of the state's environmental goals, including reducing air quality problems and changing the long-term anthropogenic drivers of global warming.

2 Empirical setting

Our study takes place in the heart of the SJV and includes eight counties: Fresno, Kern, Kings, Madera, Merced, San Joaquin, Stanislaus, and Tulare. Each county has its own federally designated metropolitan planning organization and operates its own four-step travel model. The counties are part of the San Joaquin Valley Air Pollution Control District. The region is designated by the U.S. Environmental Protection Agency (EPA) as an "extreme" nonattainment area for national one-hour ozone standard and "serious" for national eight-hour ozone standard (U.S. Environmental Protection Agency 2004), The most recent conformity demonstration was conducted in 2007. Each of the SJV counties has long-term growth projections that are significant in terms of the potential impacts to county travel and land use (Table 1; Figure 2).

Historically (Figure 1), the populations of the counties have grown at an average rate of about three percent per year (Pop), with VMT growth exceeding that rate. Average density across all of the counties has remained fairly flat regardless of population growth. The estimated transportation greenhouse gas (GHG) emissions (F) have also increased as population has increased and are projected to roughly approximate increases in VMT as new regulations come into play (e.g., the Pavley standards, which regulate GHG emissions in new vehicles, and the Low Carbon Fuel Standard). Official state projections indicate that San Joaquin County will experience the highest growth in population, adding more than 660 000 people between 2000 and 2030, while Fresno County is projected to have the largest residential and employment growth, adding more than 200 000 new households and 270 000 employees by year 2030.

To assess the impact of potential long-term growth patterns within the eight county region, we developed a process that included looking at a variety of regional and local policy variables to define a number of different long-term growth scenarios, all physically plausible but some more politically realistic than others. The variables and the scenarios were vetted by an expert review committee and then used to simulate four different land-use-change scenarios using UPlan (Johnston *et al.* 2003). The outputs of UPlan were then used to derive inputs to each of the eight counties' travel demand models.

2.1 Regional and local policy variables

Combinations of regional and local policy variables (Table 2) were evaluated to establish working scenarios for testing the travel implications of different long-term growth patterns. Regional variables represent policy issues that the state largely influences, with local participation generally funneled through regional bodies (e.g., the pollution control board or the metropolitan planning organizations). Local policy variables are assumed to be mostly or predominantly influenced by local cities and to a lesser degree by the county. To establish our working scenarios, we reviewed current local and regional policy documents with respect to each of the major variables.