Sacramento Area Council of Governments

Metropolitan Transportation Plan/ Sustainable Communities Strategy

SACOG

2035

2035


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SACOG Staff

Executives
Mike McKeever, *Chief Executive Officer*
Kirk Trost, *Chief Operating Officer/General Counsel*

Transportation Services
Matt Carpenter, *Director of Transportation Services*
Theresa Arnold, *Manager of Capital Programs*
Jim Brown, *Principal Program Expert*
Mark Heiman, *ITS/511 Manager*
Robert McCrary, *Senior Planner*
Samson Okhade, *Senior Planner*
Gary Taylor, *Senior Planner*
Renée DeVere-Oki, *Senior Planner*
José Luis Cáceres, *Associate Planner*
Barbara VaughanBechtold, *Associate Planner*
Edward Coviello, *Assistant Planner*
Lacey Symons-Holtzen, *Assistant Planner*
Clint Holtzen, *Assistant Planner*
Christine Scherman, *Junior Planner*

Modeling
Gordon Garry, *Director of Research & Analysis*
Bruce Griesenbeck, *Principal Transportation Analyst*
Raef Porter, *Senior Research Analyst*
Yanmei Ou, *Associate Research Analyst*
Shengyi Gao, *Associate Research Analyst*
Binu Abraham, *Assistant Research Analyst*

Data and GIS
Joe Concannon, *Data Services Manager*
Pete Atwood, *Associate Research Analyst*
Tina Glover, *Associate Research Analyst*
Jin Eui Hong, *Associate Research Analyst*
Laura Bell, *Assistant Research Analyst*
Luis Elizondo, *Research Technician*

Land Use Planning
Kacey Lizon, *Senior Planner*
Gregory Chew, *Senior Planner*
David Shabazian, *Senior Planner*
Jennifer Hargrove, *Associate Planner*

External Affairs and Transportation Demand Management
Rebecca Thornton Sloan, *Director of External Affairs & Member Services*
Erik Johnson, *Government & Media Affairs Coordinator*
Monica Hernández, *Community Outreach Specialist*
Sage Smith, *Graphic Designer*
A.J. Tendick, *511-Rideshare / Public Information Coordinator*
Tara Scheiter, *Transportation Demand Management Clerk*

Finance
David Ghiorso, *Finance Manager*
Daphne Chavarria, *Accountant*
Stacy Niccum, *Accountant*
Debra Overton, *Accountant*

Administration
Rochelle Tilton, *Clerk of the Board & Human Resources*
Lanette Espinoza
Elena Fong
Sabrina Bradbury
Gayle Greene
Scott Overton
Penny McNamer

Information Technology
David Hodgson

2035

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SACOG

Sacramento Area
Council of Governments
1415 L Street
Suite 300
Sacramento, CA 95814

Executive Summary

Making More with Less

The Sacramento region is a wonderful place to live. It has comfortable and inviting neighborhoods, exciting entertainment and arts, agricultural lands that feed the world, and a diversity of beautiful scenery and natural places. The Metropolitan Transportation Plan/Sustainable Communities Strategy for 2035 (MTP/SCS) is an efficient plan that gives current and future residents more options for a high quality life.

This plan addresses the needs of our current population of 2.3 million residents, by increasing maintenance of existing roads and adding more sidewalks, bike lanes, and restoring, maintaining and expanding transit, making it possible for more people to live and work in the same community and live independently as they age. It also plans for roads and transit projects where new houses and jobs are added to serve today's children when they grow up as well as new residents anticipated to move here over the next few decades.

This MTP/SCS offers more transportation and land use options and helps us make the most of transportation funds, despite funding cuts and regulatory restrictions. This plan is also the first prepared during a major, sustained national recession. State budget cuts and the collapse of the residential construction sector have severely hurt two of the strongest sectors of the region's economy. This plan reflects these economic realities in a number of ways, including a slower growth rate and lower transportation revenues than the prior plan, even more attention to land use patterns that optimize transportation performance, and by dedicating scarce revenues only to those transportation investments that produce the highest performance benefits.

This is a sustainable and more self-sufficient plan making the most of what we have and focusing future transportation investments to those with the greatest economic and environmental benefits.

While previous plans have performed well, this MTP/SCS improves on those past efforts to invest our funding wisely, reduce traveler time spent in congestion and support goods movement, reduce greenhouse gas emissions, and increase the number of residents with access to transit.

A Growing & Aging Region

By 2035, this region will have:

871,000 More People

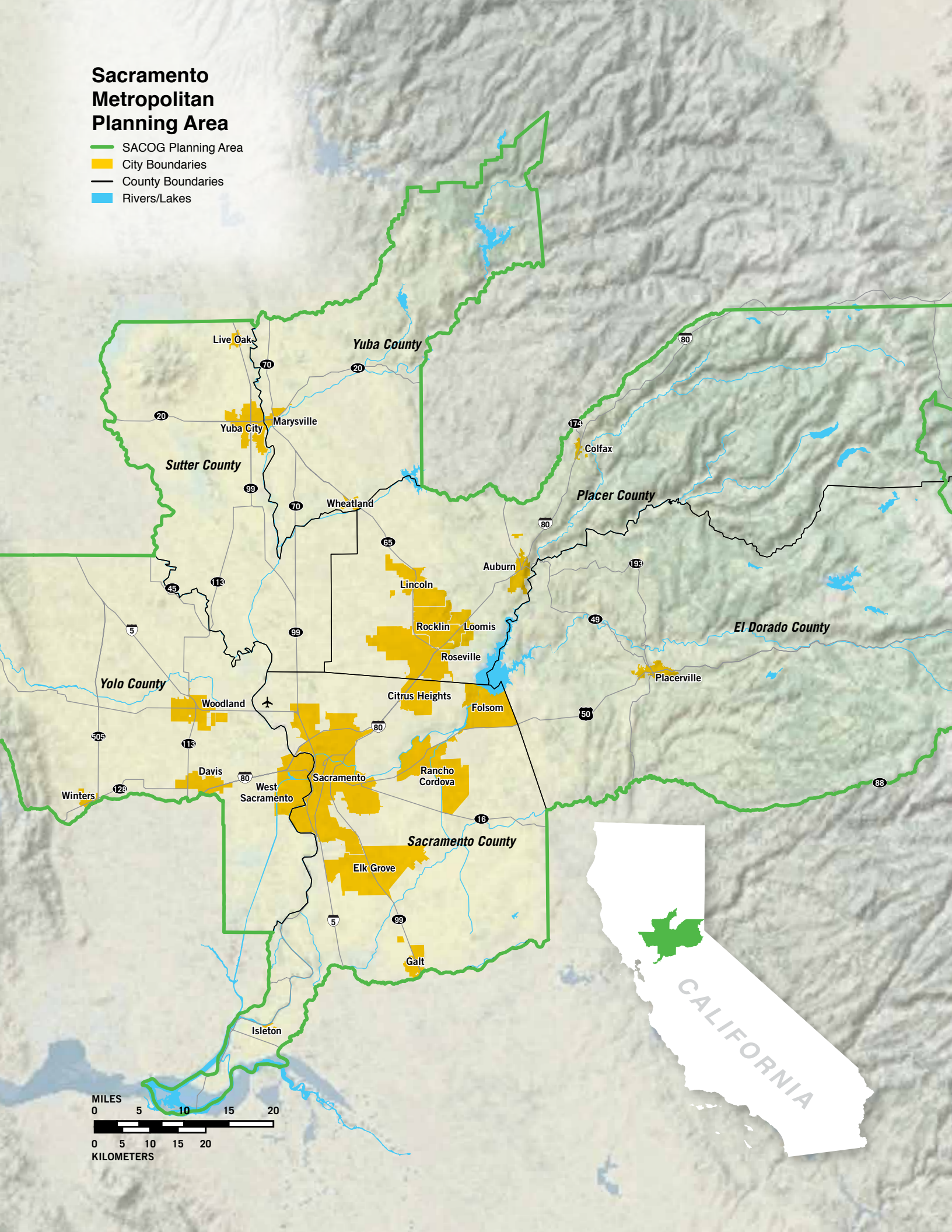
303,000 New Homes

$ $ $

361,000 New Jobs

$35.2b

Transportation Investment Budget


Sacramento Metropolitan Planning Area
SACOG Planning Area
City Boundaries
County Boundaries
Rivers/Lakes
Live Oak
Yuba County
Yuba City
Marysville
Sutter County
Wheatland
Colfax
Placer County
Auburn
Lincoln
Rocklin
Loomis
Roseville
El Dorado County
Placerville
Yolo County
Woodland
Citrus Heights
Folsom
Davis
Winters
West Sacramento
Sacramento
Rancho Cordova
Sacramento County
Elk Grove
Galt
Isleton
CALIFORNIA
MILES
0 5 10 15 20
0 5 10 15 20
KILOMETERS

MTP/SCS Guiding Principles

Smart Land Use
Design a transportation system to support good growth patterns, including increased housing and transportation options, focusing more growth inward and improving the economic viability of rural areas.

Environmental Quality and Sustainability
Minimize direct and indirect transportation impacts on the environment for cleaner air and natural resource protection.

Financial Stewardship
Manage resources for a transportation system that delivers cost-effective results and is feasible to construct and maintain.

Economic Vitality
Efficiently connect people to jobs and get goods to market.

Access and Mobility
Improve opportunities for businesses and citizens to easily access goods, jobs, services and housing.

Equity and Choice
Provide real, viable travel choices for all people throughout our diverse region.

Blueprint

Using the Blueprint as its foundation, SACOG adopted an MTP in 2008 that for the first time proactively linked land use, air quality and transportation needs. The 2008 MTP put more money towards offering residents more transportation choices and reducing the number of vehicle trips than any previous plan. This balance provides for high-occupancy vehicle lanes (i.e., carpool/express bus) on freeways, bridges that shorten distances for motorists and bicyclists, and complete streets that safely accommodate vehicles, transit, bicyclists, and pedestrians.

Since the adoption of the last plan in 2008, California passed the Sustainable Communities and Climate Protection Act, Senate Bill 375 (SB 375). This law focuses on aligning transportation, housing, and other land uses to, among other things, achieve greenhouse gas (GHG) emissions reduction targets established by the California Air Resources Board (ARB). SB 375 requires each region of the state to develop an SCS as part of the MTP, which identifies policies and strategies to reduce per capita GHG emissions from passenger vehicles. The SCS is intended to encourage an integrated approach to land use and transportation planning that not only reduces vehicle travel, but accommodates an adequate supply of housing, reduces impacts on valuable habitat and productive farmland, increases resource use efficiency, and promotes a prosperous regional economy.

FOR MORE INFORMATION ON THE BLUEPRINT AND SB 375, SEE CHAPTER 1.

The comprehensive look at transportation, land use and air quality in this plan is not new to the Sacramento region. In 2002, SACOG began the Sacramento Blueprint Project, a regional visioning process to study the connections between transportation, land use, and air quality. Planning and design choices made by a community have many impacts on regional development patterns, transportation modal choices, infrastructure costs, redevelopment potential, natural resources, and other aspects of livability. The SACOG Board of Directors adopted the Preferred Blueprint Scenario in 2004—a bold vision for regional growth that promotes compact, mixed-use development and more transit and active transportation choices.

Building the Plan

Starting in 2009, the SACOG Board of Directors considered recommendations from policy and advisory committees, local agencies, focus groups, residents and SACOG staff, and deliberated on the plan during all stages of development.

Close coordination between SACOG staff and local agency staff, including planning and public works departments as well as local transit agencies, was key to the development of the MTP/SCS land use forecast and transportation projects and investments list. SACOG developed the MTP/SCS with a broad public involvement process, including focus groups, working groups, and community workshops within each of the six counties in the region, from the summer of 2010 through the end of the planning process.

As part of the planning process, SACOG created three scenarios that varied in land use pattern and transportation investments while using the same overall growth projections and transportation budget. By measuring the performance differences and engaging participants in a discussion of trade-offs between the three scenarios, a preferred scenario was created, which comprises the land use forecast and transportation projects and investments in this MTP/SCS.

MORE DETAILED INFORMATION ON THE PLANNING PROCESS, INCLUDING SCENARIO BUILDING AND PUBLIC PARTICIPATION CAN BE FOUND IN CHAPTER 2 AND APPENDICES G-1, G-2, G-3, AND G-4.

SACOG is designated by the state and federal governments as the Metropolitan Planning Organization (MPO) and responsible for developing a regional transportation plan every four years in coordination with Sacramento, Yolo, Yuba, Sutter, El Dorado and Placer counties and the 22 cities within those counties (excluding the Tahoe Basin). This plan, the Metropolitan Transportation Plan/ Sustainable Communities Strategy for 2035 (MTP/SCS) covers the period from 2008 to 2035 and is an update to the Metropolitan Transportation Plan for 2035 that was adopted in 2008.

A Growing Region, Growing Options

A foundation of the MTP/SCS transportation and land use forecast assumptions is the regional growth forecast. In consultation with local planning departments, SACOG prepares an estimated 2035 growth pattern for the region, which was built by examining a wide range of factors in two areas: market forces and policy/regulatory influences.

The forecasted growth pattern is based on adopted local government general plans, community plans, specific plans and other local policies and regulations. Other variables are considered to help refine the sum of the local plans in order to create the most likely future development pattern.

SACOG's MTP/SCS growth forecast can never be just the sum of its 28 member local governments' adopted general plans at any given point in time. The MTP/SCS and local general plans are two related, but different, kinds of planning documents. General plans are by nature aspirational, have widely ranging timeframes and are not comprehensively updated very frequently. The MTP/SCS must be a fiscally and time-constrained plan, with a forecasted growth pattern that is consistent with—not exceeding—the amount of forecasted population, employment, and housing growth for the region by 2035. The transportation investments in the MTP/SCS must be similarly constrained (see Chapter 4, below).

Including growth within the MTP/SCS is not a guarantee that it will happen. Likewise, growth in areas outside the MTP/SCS may occur by 2035. The MTP/SCS does not regulate local land use authority or preclude a local jurisdiction from planning and approving growth that is different in terms of total units or geographic extent.

Voluntary land use decisions by cities and counties will be critical to the success of this MTP/SCS. Over time, the region has increasingly committed to integrating regional transportation plans and local land use plans so that they reinforce each other in order to minimize regulatory constraints and maximize the opportunities for a steady flow of transportation funds to the region. A survey of local planning efforts shows that since 2005, the 28 cities and counties of the SACOG region have been working voluntarily to incorporate the Blueprint principles into their local plans and policies. These efforts are reflected in the MTP/SCS land use forecast.

FOR MORE INFORMATION ON THE LAND USE FORECAST, SEE CHAPTER 3 AND APPENDIX E-3.

Community Types Framework

SACOG created a framework for describing the MTP/SCS that is made up of Community Types. Local land use plans were divided into one of five Community Types.

Center and Corridor Communities
Center and Corridor Communities are typically higher density and more mixed than other areas.

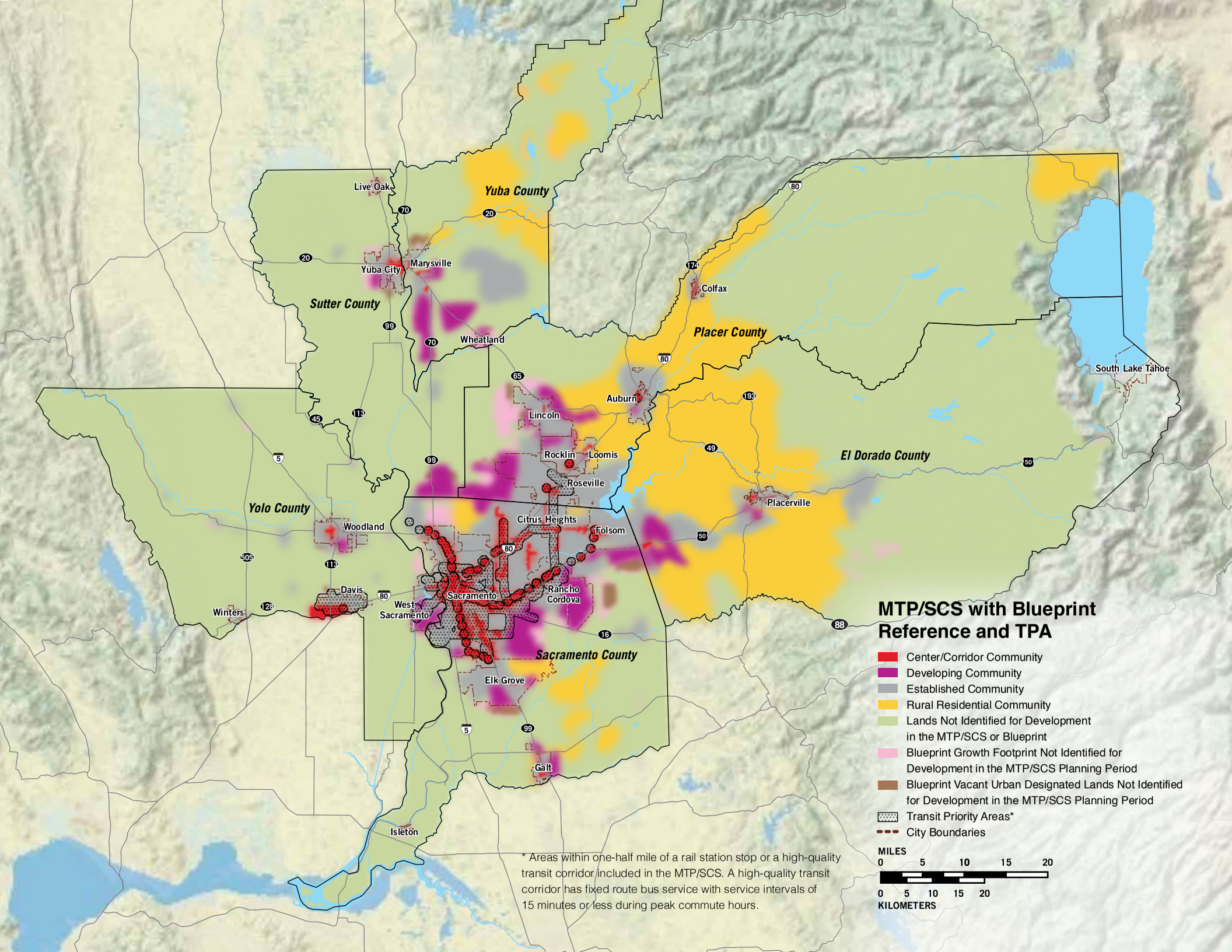
Established Communities
Established Communities are typically made up of existing low- to medium- density residential neighborhoods, office and industrial parks, or commercial strip centers.

Developing Communities
Developing Communities are typically, though not always, situated on vacant land at the edge of existing urban or suburban development; they are the next increment of urban expansion.

Rural Residential Communities
Rural Residential Communities are typically located outside of urbanized areas and are predominately residential, with some small-scale hobby or commercial farming.

Lands Not Identified for Development in the MTP/SCS Planning Period
These areas of the region are not expected to develop to urban levels during the MTP/SCS planning period.

SEE CHAPTER 3 FOR MORE DETAILED DESCRIPTIONS OF EACH OF THE COMMUNITY TYPES.


Live Oak
Yuba County
Yuba City
Marysville
Sutter County
Wheatland
Colfax
Placer County
South Lake Tahoe
Auburn
Lincoln
Rocklin
Loomis
Roseville
El Dorado County
Placerville
Yolo County
Woodland
Citrus Heights
Folsom
Davis
Sacramento
Rancho Cordova
West Sacramento
Winters
Sacramento County
Elk Grove
Galt
Isleton
MTP/SCS with Blueprint Reference and TPA
Center/Corridor Community
Developing Community
Established Community
Rural Residential Community
Lands Not Identified for Development in the MTP/SCS or Blueprint
Blueprint Growth Footprint Not Identified for Development in the MTP/SCS Planning Period
Blueprint Vacant Urban Designated Lands Not Identified for Development in the MTP/SCS Planning Period
Transit Priority Areas*
City Boundaries
MILES
0 5 10 15 20
0 5 10 15 20
KILOMETERS
* Areas within one-half mile of a rail station stop or a high-quality transit corridor included in the MTP/SCS. A high-quality transit corridor has fixed route bus service with service intervals of 15 minutes or less during peak commute hours.

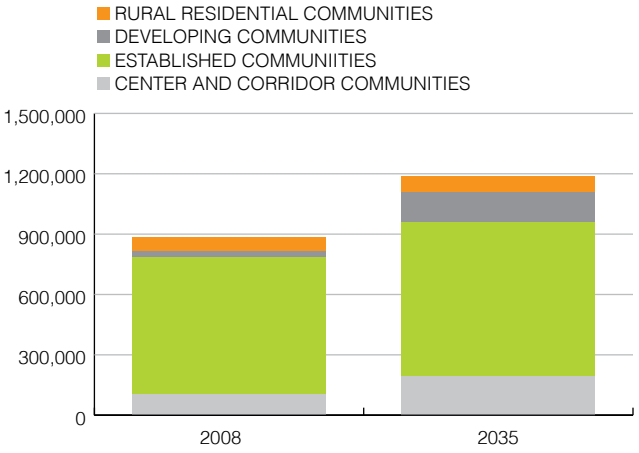
Details of the Land Use Forecast

The land use forecast of the MTP/SCS follows the methodology in Chapter 3 and Appendix E-3 to assign growth to each of the Community Types. The resulting land use forecast focuses on providing a compact land use pattern that provides housing and transportation choice.

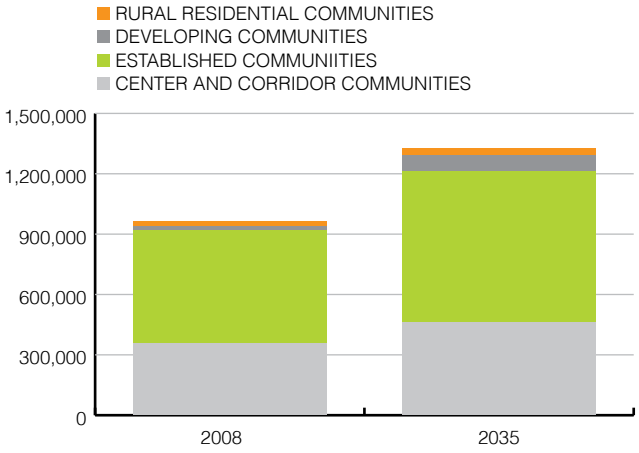
Compact Development

A growth pattern that is more compact fosters more walking, biking, transit use, and shorter auto trips by supporting the transportation infrastructure conducive to these modes of travel. The projected addition of more small-lot and attached housing, increased infill and redevelopment opportunities, and planning for communities with a mix of uses, creates a more compact land use pattern. Just over half of the newly developed land is located in Established Communities and Center and Corridor Communities. The MTP/SCS land use pattern accommodates a 40 percent population increase with only an additional 7 percent of land developed (53,266 acres). This greatly contributes to the reduced impact to natural resources.

2008 & 2035 Housing Units



2008 & 2035 Jobs



1988–2005

333

For every 1,000 new residents, 333 acres of farmland urbanized

2008–2035

42

For every 1,000 new residents, 42 acres of farmland urbanized

Reduce Impacts on Farmland

By focusing growth in areas of the region with existing housing, the MTP/SCS results in fewer acres of farmland converted than in the past.

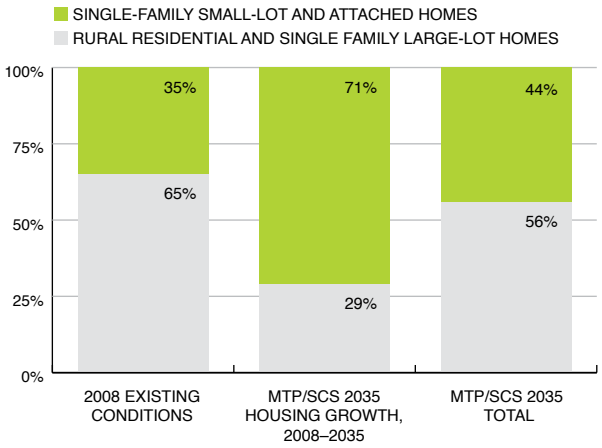
CHAPTER 7 INCLUDES A FULL DISCUSSION ON ENVIRONMENTAL SUSTAINABILITY.

Housing Options

Providing a variety of housing options, including apartments, condominiums, townhouses, and single-family detached homes on varying lot sizes, creates opportunities for the variety of people who need them: families, singles, seniors, and people living with special needs.

Recent demographic studies indicate that housing choice will become an increasingly important issue in the future as the population is dominated by older adults and more ethnic diversity. Evolving demographics and preferences held by specific demographic groups or generational cohorts are driving the change in housing preference and demand. Additionally, recent research suggests that not only will people want a choice in terms of location and housing product type, but also that a higher percentage of the population will choose to rent, and will rent for longer periods than has occurred historically. While there is no clear line between housing product type and rental versus ownership, traditionally attached housing units have a higher rental rate than detached housing units. Based on the available evidence, the MTP/SCS estimates that there will be growing demand for attached and small-lot single-family housing products over the planning period of the MTP/SCS, along with lower demand for large-lot single-family housing products, which currently make up the large majority of the current housing in the region. As a result of this projected demand and the Blueprint-supportive planning that local agencies have adopted, the MTP/SCS provides a mix of housing options that focuses on improving the current relative shortages of attached and small-lot products.

Summary of Housing Product Mix



Rural Residential:

Single-family detached homes built at densities less than one dwelling unit per acre.

Large-Lot Single-Family:

Single-family detached homes built at densities between one and eight dwelling units per acre.

Small-Lot Single-Family:

Single-family detached homes built at densities between eight and 25 dwelling units per acre.

Attached:

Single-family and multi-family homes ranging from duplexes, triplexes, lofts, apartments, condominiums, townhomes, row houses, half-plexes, etc., built at densities from 8 to over 50 dwelling units per acre.

Transit Priority Areas

Transit Priority Areas are areas of the region within one-half mile of a major transit stop (existing or planned light rail, street car, or train station) or an existing or planned high-quality transit corridor included in the MTP/SCS. A high-quality transit corridor is a corridor with fixed route bus service with service intervals no longer than 15 minutes during peak commute hours.

While substantial overlap exists between TPAs and Center and Corridor Communities, TPAs provide additional opportunities to realize the benefits of smart land use during the MTP/SCS planning period. These include:

- using SB 375 California Environmental Quality Act streamlining benefits available to qualifying residential and mixed-use projects to facilitate transit-oriented development;
- increasing housing options located near high quality transit, while bringing high-quality transit service to an additional 152,216 existing housing units and 240,013 existing employees;
- increasing ridership to support existing and new rail and bus services and reduce vehicle miles traveled and GHG emissions;
- increasing farebox recovery rates, or the ability for rider fares to cover a larger share of the costs of transit service; and
- increasing equity by increasing housing and transportation options and transit access to jobs, schools, services for low-income residents, as described more fully in Chapter 8—Equity and Choice.

MORE DETAILED INFORMATION ON TRANSIT PRIORITY AREAS IS LOCATED IN CHAPTER 3.

Equity and Choice

The MTP/SCS includes an environmental justice analysis in order to determine whether the Plan benefits low-income and minority communities equitably, and whether the Plan's transportation investments have any disproportionate negative effects on minority and/or low-income populations in the SACOG region. Today, about 26 percent of the region's population lives in a defined environmental justice area.

The MTP/SCS complements planned land use changes with improvements in transportation options that increase residents' access to key destinations. Expanded travel options especially benefit households in environmental justice areas because they tend to use transit, walking and bicycling at significantly higher rates than non-environmental justice households—more than twice the rate for transit use and a 50 percent greater rate for walking and bicycling region-wide.

Access to good transit improves for low-income and minority populations

88%

Increase to transit service hours in areas of high minority populations and/or low-income populations.

30 minute transit ride

48%

increase in access to jobs within a 30-minute transit ride.

30 minute drive

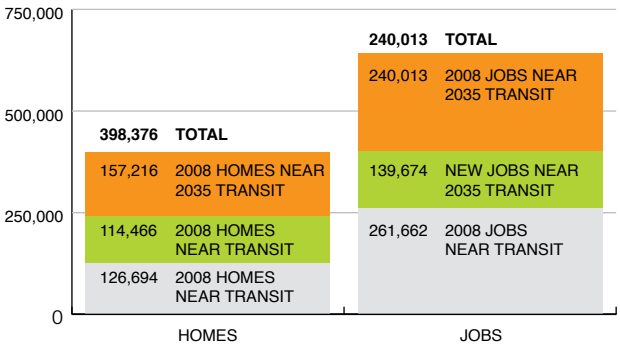
30%

increase in access to jobs within a 30-minute drive.

CHAPTER 8 INCLUDES A FULL DISCUSSION ON EQUITY AND CHOICE, INCLUDING DETAILED ENVIRONMENTAL JUSTICE ANALYSIS.

Share of New Homes and Jobs Near High-Frequency Transit

More existing homes and jobs get access to transit.



Transportation Investments

This plan is the foundation for agreements about the most beneficial transportation projects to target for construction funding now. This focus helps us to maximize the value of scarce resources and be nimble and opportunistic when competitive funding opportunities become available.

Investments to Realize the MTP/SCS Vision

The MTP/SCS will make investments totaling $35.2 billion (in current dollars) to improve the regional transportation system. Funding to support the transportation investments in the plan comes from a number of federal, state, and local sources which have all declined since the adoption of the 2008 MTP. Chapter 4, Appendix A-1 and Appendix B-1 provide more detailed descriptions of SACOG's budget, revenue, and investment assumptions. The MTP/SCS must be a fiscally and time-constrained plan, with a transportation system that supports the forecasted growth pattern for the region by 2035.

With transportation revenues from all sources increasingly limited, the MTP/SCS prioritizes investments that maintain, preserve, and make more efficient use of existing road and transit assets to help defer or even eliminate the need for some road capacity expansions. This emphasis on lower-cost operational improvements and right-sizing of road expansion projects is an important component of an MTP/SCS that achieves strong performance benefits with lower funding levels. The result is a more multimodal transportation system that makes better use of existing capacity.

Financial Stewardship

Between 2008 and 2035, we project the region will spend $35.2 billion in federal, state and local funds on transportation.

Road and Highway Maintenance and Rehabilitation	$11.5 billion
Transit Investments	$11.3 billion
Road and Highway Capital Improvements	$7.4 billion
Bicycle and Pedestrian Improvements	$2.8 billion
Planning, Programs, and Enhancements	$2.2 billion
Total	**$35.2 billion**

Improving the State of Good Repair

The maintenance and rehabilitation budget allocates $11.5 billion, to preserve, maintain, and rehabilitate the region's roads, highways, bridges, trails, sidewalks and other bicycle and pedestrian facilities. Of the overall total, an estimated 5 percent, or nearly $600 million, is spent on bicycle and pedestrian facilities as part of maintenance and rehabilitation projects.

Funding Challenges for Road Maintenance

Cities and counties face a critical challenge in providing adequate maintenance and rehabilitation for their roads. Communities cannot function without a well-maintained local street and road network. Roads throughout the region, while generally in fair condition today, are at risk of degrading to a point where routine maintenance is insufficient and more extensive, and expensive, repairs are needed. Road maintenance is also an important strategy in supporting infill and reinvestment in urban and suburban areas.

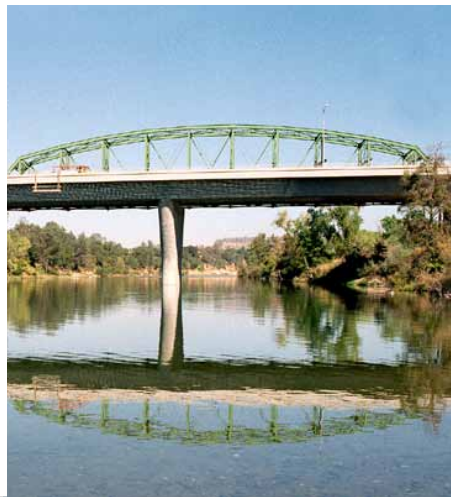
The MTP/SCS prioritizes preservation of the existing transportation system when making investment decisions with revenues that can be used for maintenance and rehabilitation purposes. Generally, federal and state money is not available to assist with routine maintenance; however, as roads deteriorate and require more extensive reconstruction, SACOG taps federal and state funds to help local governments bring roads back to a good state of repair. The MTP/SCS also calls for additional revenue equivalent to what would be raised by a new 1/2-cent sales tax in Sacramento County to help pay for road maintenance and transit operations. MTP/SCS policies and strategies reinforce this priority for addressing chronic road maintenance issues and tradeoffs between road maintenance, improvements and expansions.

CHAPTER 10—FINANCIAL STEWARDSHIP INCLUDES A DETAILED DISCUSSION OF CHALLENGES TO REACHING A STATE OF GOOD REPAIR.

Types of maintenance and rehabilitation projects include:

- routine and preventive maintenance projects intended to extend the life of roads, and highways, including sealing cracks, repairing pavement, cleaning and repairing drains, fixing signals, and sweeping streets;
- more extensive repair, rehabilitation, and reconstruction of roads, including sealing pavement, repaving, reconstructing subgrade and drainage, and reconfiguring intersections;
- bicycle, pedestrian, safety and aesthetic improvements, such as striping, curb ramps, sidewalk gap closures, rail crossings, and landscaping as part of larger rehabilitation projects; and
- replacement, rehabilitation, painting, scour countermeasures, and bridge approach barrier and railing replacements on local and state-owned bridges.

SEE APPENDIX A-1 FOR THE FULL LIST OF TRANSPORTATION PROJECTS.



Strategic and Cost-Effective Road and Bridge Investments

The MTP/SCS spends $7.4 billion on road, highway and bridge operational and capacity projects. More than two-thirds of the total road and highway investment pays for operational or capacity improvements to existing facilities, while the remainder of the budget includes a mix of new road and highway investments to serve infill and new growth areas. The plan focuses on more cost-effective operational improvements and strategic capacity projects. Right-sizing road investments for maximum cost-effectiveness is an important component of an MTP/SCS that achieves strong performance benefits with lower funding levels.

In the MTP/SCS 97 percent of new lane miles are on surface streets, not freeways. The MTP/SCS road investments emphasize access to infill development areas, congestion relief, support for bus and rail transit, and improved bicycle and pedestrian access. Local road investments increase capacity for local passenger travel, creating a benefit to goods movement on highways.

SEE APPENDIX A-1 FOR THE FULL LIST OF TRANSPORTATION PROJECTS.

Examples of local road investments in the MTP/SCS:

Road operational improvements for urban and suburban areas:

- interchange and intersection bottleneck relief;
- street improvements to support improved transit access; and
- investments to support bus rapid transit corridors and improve access to transit-oriented developments.

Road operational improvements for rural and small communities:

- improved road safety along farm-to-market routes and corridors along the urban/rural edge;
- operational improvements that close shoulder gaps;
- improve rural road intersections; and
- provide safer crossings within communities divided by highways or railroads.

New and expanded urban arterial roads to meet community and regional travel needs:

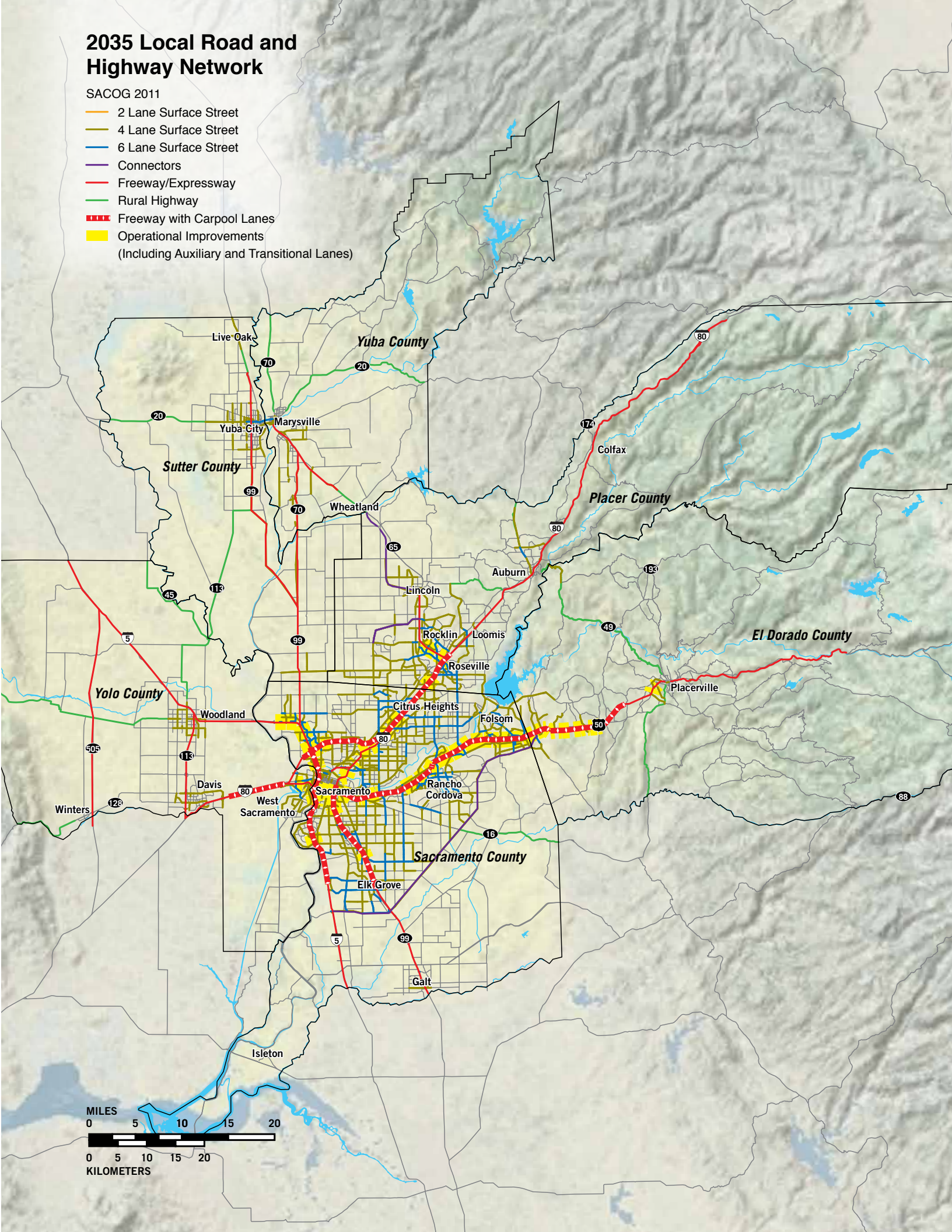
- road improvements primarily serving emerging activity centers, including Rancho Cordova, Folsom, West Sacramento and southern Placer County that will have a significant share of projected employment and housing growth by 2035; and
- expansions include complete streets features in order also to support transit and bicycle/pedestrian travel.

Connector roads, including the Placer Parkway in southern Placer County and the Capital Southeast Connector serving Elk Grove, Rancho Cordova and Eastern Sacramento County, Folsom and El Dorado County:

- the Placer Parkway is a four-lane road in a new right-of-way and
- Capital Southeast Connector in the MTP/SCS is an expansion of existing segments of Kammerer Road, Grant Line Road and White Rock Road.

Street safety measures:

- left-turn lanes at intersections;
- improved lighting and signage;
- special paving;
- median strips, particularly where there are high numbers of automobile or pedestrian accidents; and
- safety investments are also made at rail grade-crossings and urban interchanges.


2035 Local Road and Highway Network
SACOG 2011
2 Lane Surface Street
4 Lane Surface Street
6 Lane Surface Street
Connectors
Freeway/Expressway
Rural Highway
Freeway with Carpool Lanes
Operational Improvements
(Including Auxiliary and Transitional Lanes)
Live Oak
Yuba County
Marysville
Yuba City
Sutter County
Wheatland
Colfax
Placer County
Auburn
Lincoln
Rocklin
Loomis
Roseville
El Dorado County
Placerville
Yolo County
Woodland
Citrus Heights
Folsom
Davis
Sacramento
Rancho Cordova
West Sacramento
Winters
Sacramento County
Elk Grove
Galt
Isleton
MILES
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0 5 10 15 20
KILOMETERS

State Highway Projects

State highway investments focus on operational improvements and strategic new carpool and auxiliary lanes in many interior areas of the freeway system. Collectively, these investments serve travel between activity centers and accommodate trucks for inter-regional goods movement. Fixing bottlenecks along trucking corridors is important, as each truck represents the traffic-generating equivalent of two to four automobiles in stop-and-go traffic.

Added freeway lane miles account for only 3 percent of the total in new road capacity. Of this increase in freeway lane miles, over 75 percent are carpool lanes, auxiliary lanes, new ramps or widened ramps. Most of the carpool, auxiliary, and transition lane additions occur in the urbanized part of the region and are directed at closing gaps that relieve congestion along major commute corridors during peak commute periods and to serve suburban job centers where it will take time to build up employment densities to the point that transit can effectively serve them.

Example state highway projects include:

Carpool lanes:

- between Davis and West Sacramento on I-80/U.S. 50 in Yolo County;
- as far north as the I-80 interchange on I-5 in Sacramento County;
- as far east as Greenstone Road on U.S. 50 in El Dorado County;
- some auxiliary lanes are included beyond those limits where they are cost-effective and provide good performance; and
- a complement to these corridor investments is an increase in express bus services between activity centers.

Operational improvements for congested or unsafe interchanges:

- including freeway-to-freeway interchanges along U.S. 50 and I-80 and at primary freeway-to-arterial corridors, including Watt Avenue and U.S. 50, and Elkhorn Boulevard and Route 99.

Operational improvements for roadways:

- guardrails and improved shoulders along critical sections of freeways and highways and
- special paving (e.g., diamond grooving, reflectors, skid-reducing material) and lighting along specific road segments to improve safety.

Incident management investments:

- including changeable message signs for traffic alerts and increased freeway service patrols.

SEE APPENDIX A-1 FOR THE FULL LIST OF TRANSPORTATION PROJECTS.

Bridge and River Crossing Investments

The MTP/SCS includes over $600 million in investments for the development of more road, transit, bicycle, and pedestrian capacity on the region's bridges. Three-quarters of this budget pays for major crossings of the American, Sacramento, and Feather rivers, with the remainder going towards minor capacity expansions on small crossings of creeks and tributaries.

Example bridge projects include:

Improved river access across the American and Sacramento rivers into downtown Sacramento:

- new river crossings across the lower American River from Sacramento to South Natomas, and across the Sacramento River from West Sacramento to Sacramento to provide access into downtown Sacramento where there will be a large increase in jobs and residents by 2035.

Feather River crossings at Yuba City:

- improvements to the 5th Street and 10th Street bridges, with redesigned approaches and distribution on both ends, to link Yuba City and Marysville more effectively and avoid the high cost of a third bridge.

Whitelock Parkway Bridge:

- new bicycle and pedestrian crossing of Highway 99 in Elk Grove.

One-to-two and two-to-four lane widenings on a number of small waterway crossings.

Bicycle and pedestrian retrofits on existing and new bridges.

SEE APPENDIX A-1 FOR THE FULL LIST OF TRANSPORTATION PROJECTS.

Programs, Planning, and Operations

The plan supports $2.2 billion in funding for supplementary programs, planning, and operational efforts.

Example programs and planning and operations projects include:

- Air Quality Improvement Programs
- Travel Demand Management
- 511 Traveler Information
- Community Enhancements
- Project Development Support

CHAPTER 4 INCLUDES MORE DETAIL ON PROGRAMS, PLANNING, AND OPERATIONS. SEE APPENDIX A-1 FOR THE FULL LIST OF TRANSPORTATION PROJECTS.

Funding Challenges for Transit Operations

Operating public transit systems requires a significant financial commitment. In 2008, the 14 transit services in the region needed about $230 million to operate fixed route and dial-a-ride services. These operating costs include drivers, mechanics, dispatching, fuel, parts, supplies, services, and administration.

Over the course of the MTP planning period, significantly higher levels of funding for transit operations are needed for the region to meet its goals for a robust transit system. Maintaining current levels of transit service, restoring previous routes, frequencies or hours, and expanding operations in the future are primarily constrained by limited dedicated revenues for transit operations. Transit providers in the region have few opportunities to capture new revenues for operations and maintenance costs, and often use flexible funds that could otherwise be utilized for capital expansion to help support operational costs.

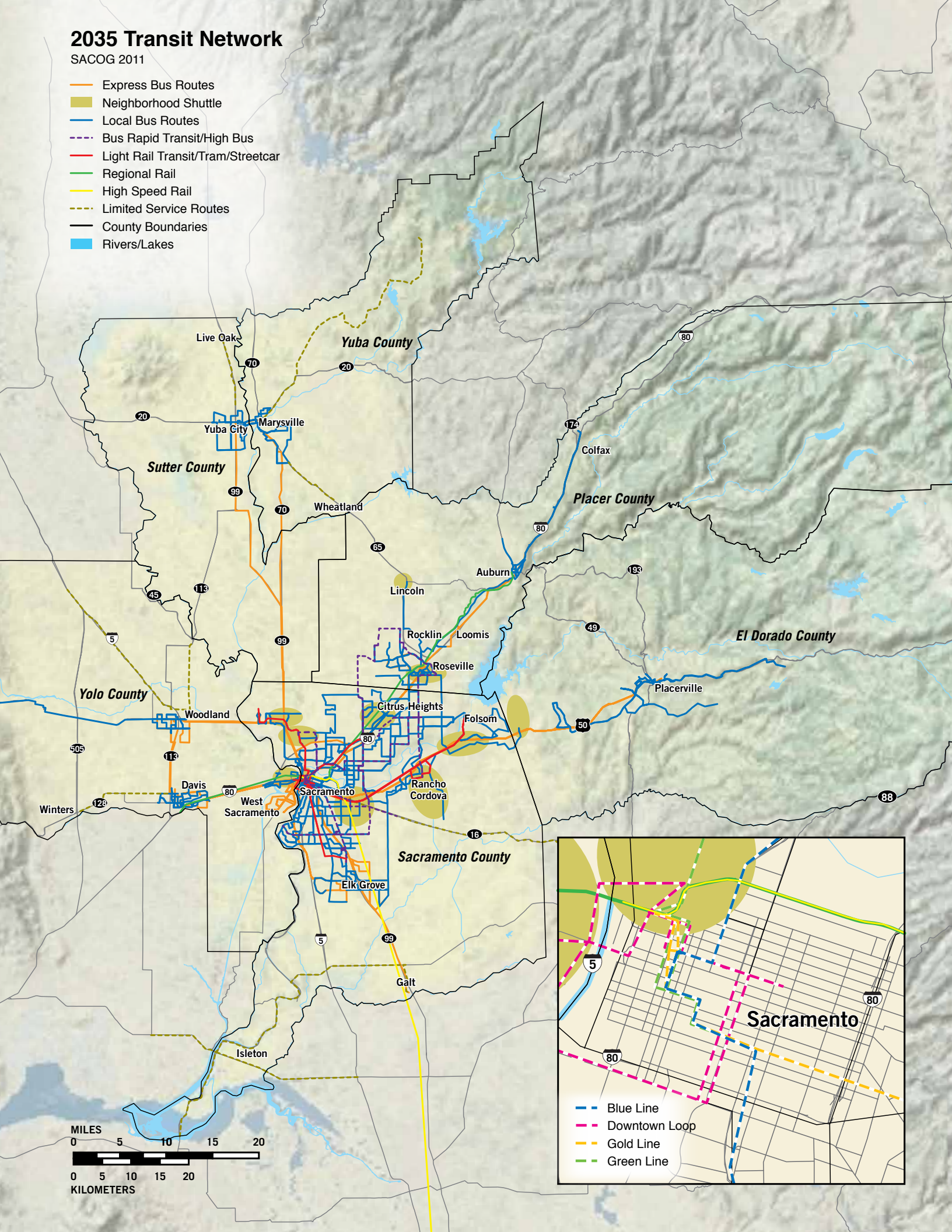
Fare increases can help cover this gap, but increases need to be sensitive to the ability of transit-dependent persons to pay, balancing the need to raise revenue and meet state requirements for fares to cover a certain proportion of operating costs (the farebox recovery rate), with the ability of transit-dependent riders to pay for service supports good policy decisions for expanding services in the region. In the SACOG region, the regional average for farebox recovery was 24 percent in 2009. Smaller rural and suburban operators typically fall below this level, while a number of the larger operators in the region now cover 26–28 percent or more of operating costs with fare revenue.

CHAPTER 10—FINANCIAL STEWARDSHIP INCLUDES A DETAILED DISCUSSION OF CHALLENGES TO TRANSIT FUNDING.

2035 Transit Network

SACOG 2011

- Express Bus Routes
- Neighborhood Shuttle
- Local Bus Routes
- Bus Rapid Transit/High Bus
- Light Rail Transit/Tram/Streetcar
- Regional Rail
- High Speed Rail
- Limited Service Routes
- County Boundaries
- Rivers/Lakes



Expanding Public Transit Options Through Increased Productivity

The MTP/SCS provides $11.3 billion in transit capital and operating investments. Two-thirds of this funding is consumed by the cost of operating and maintaining the transit system. Intercity rail operations take up about 7 percent of the transit budget or roughly $800 million and are covered by state funding outside the control of regional operators. The balance pays for capital expenses such as purchasing new buses and rail vehicles, infrastructure associated with adding routes and stations to the bus and rail system, building new storage and maintenance facilities, and improvements to help buses move more quickly through traffic.

Increased operational efficiencies are a key aspect of the MTP/SCS in addressing the transit operations funding challenge. Existing transit services are assumed to continue while new transit investments focus on the corridors with more compact and mixed land uses that are most capable, encouraging increased ridership and supporting robust transit service. Providing high-frequency service of 15 minutes or better in areas with more compact and mixed uses allows the MTP/SCS to provide more cost-effective and productive transit service. The result is a 72 percent increase in regionwide transit productivity over levels in the 2008 MTP. For transit, overall system productivity is usually measured by the passenger boardings per service hour provided.

The more productive a route or system is, the more passengers will board per unit of service provided. Because of higher productivity, there is a significantly higher percentage of operating costs covered by fares. Farebox revenues available to fund transit operations rises from about 24 percent of operating costs in 2009 to 38 percent of operating costs by 2035. Saving public dollars through higher farebox recovery allows the transit investments in the MTP/SCS to have a larger impact. With the increased transit productivity, the MTP/SCS results in a total daily transit trip increase of 256 percent by 2035, while only increasing transit service hours by 98 percent from 2008 levels.

ADDITIONAL DISCUSSION OF TRANSIT PRODUCTIVITY IS IN CHAPTERS 5 AND 10.

Types of MTP/SCS transit projects include:

- More frequent transit service with greater regional coverage, with 15-minute or less service on many corridors. The plan calls for 53 percent of all transit services (bus and rail) to operate 15-minute or better service by 2035, versus 24 percent of services today.
- Expansion of ADA paratransit services to keep up with the fast-growing senior population, and regular replacement of paratransit vans equipped with technologies that optimize trip planning.
- More replacement buses, running on alternative fuels.
- Strategic expansion of regional and local rail where it can be cost-effective given surrounding housing and employment densities. New local rail expansions include light rail to Cosumnes River College and the Sacramento International Airport and the introduction of streetcars in Rancho Cordova and between downtown Sacramento and West Sacramento.
- Operational improvements to improve rail service frequencies.
- Increased transit security, including patrols and lighting.

SEE APPENDIX A-1 FOR THE FULL LIST OF TRANSPORTATION PROJECTS.

MTP/SCS meets Air Resources Board SB 375 passenger vehicle greenhouse gas targets

10 percent per capita reduction by 2020

16 percent per capita reduction by 2035

Transportation Trends and Performance

Because the MTP/SCS is a long-range transportation plan, the degree to which it enhances the performance of the region's transportation system and improves mobility and access for residents of the region over time are key measures of success. This is especially important to ensure more efficient vehicle and freight movement, and improve mobility options for cost, health, environmental, or other reasons.

Addressing changes in the economy, changes in regulations and planning requirements, and changing expectations and priorities for local cities, counties, and residents of the region is a key component of this Plan that can be addressed by various transportation performance indicators.

Transportation plans often focus on improving mobility through investment in transportation infrastructure and services. Measures of mobility, such as the percent of travel using a particular travel mode or mode share, travel time, and travel delay provide valuable information about how well current and planned transportation systems function. Through the course of the entire MTP/SCS planning process, the performance focus has been on the following critical indicators:

- vehicle miles traveled (VMT) on the region's roads;
- the level of congestion and delay for all modes, but especially road congestion;
- transit ridership and the share of trips made by transit modes; and
- travel by non-motorized travel modes (bike and walk) and the share of trips made by those modes.

CHAPTER 5A CONTAINS A FULL DESCRIPTION OF THESE INDICATORS.

Road Congestion

In general, congestion occurs on roads when the number of drivers who wish to use a particular route exceeds the capacity of that route. SACOG measures the presence of congestion on roads by estimating and tracking how much of the total VMT occurs on roads that are at or above their reasonable capacities. SACOG defines a congested VMT (CVMT) as a VMT that occurs on roads with volume-to-capacity ratios of 1.0 or greater.

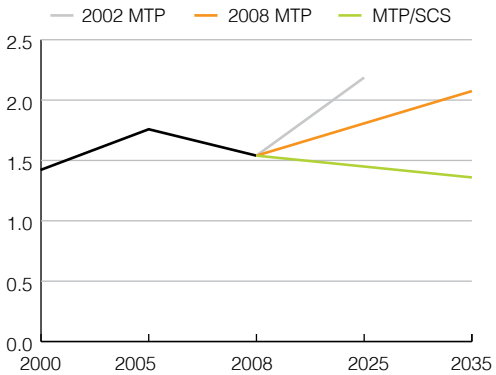
A key transportation issue is the need to move approximately 100,000 workers to and from downtown Sacramento for work. This central city commute pattern, common in most large urban regions around the country, presents a peak capacity challenge to the core of both the region's highway and transit systems. The continuing growth of Rancho Cordova and Roseville as major centers with strong employment and housing growth is also an important issue. By 2035, the MTP/SCS projects that commuting to Rancho Cordova will increase by nearly 50 percent, and by nearly 40 percent to Roseville.

Although the MTP/SCS projects some long-distance commuting will continue to downtown Sacramento, Rancho Cordova, south Placer County and other major job centers, the per capita decline in vehicle miles traveled reflects improvement from today. Land use changes in the MTP/SCS focused on a better jobs-housing ratio and greater mixing of uses, combined with high-quality transit corridors and more complete streets, will support more and shorter commute trips made by transit, biking, or walking, reducing some of the peak hour demand and congestion generated by driving alone.

CHAPTERS 4, 5A, AND 5B CONTAINS A NUMBER OF PROJECTS, DESCRIBED IN MORE DETAIL, TO ADDRESS CAPACITY NEEDS AND CONGESTION ON COMMUTE CORRIDORS THROUGH 2035.

CHAPTER 9—ECONOMIC VITALITY INCLUDES MORE DETAIL ON REGIONAL EMPLOYMENT PATTERNS AND JOB PROJECTIONS.

Congested Miles Driven per Capita per day



Transit, Bicycling, And Walking

Travel by transit offers many benefits to the performance of the regional transportation network in the Sacramento region. First, transit provides an opportunity for substantially reducing VMT, through shifts from low-occupancy modes such as driving alone to a very high occupancy mode of travel. Second, for commute trips, which tend to occur at peak periods of travel demand when congestion is highest, transit can provide substantial congestion relief. High quality transit service can also provide necessary mobility for both transit-dependent and choice riders, and residents and employees in higher density, mixed-use areas where auto travel can be impractical.

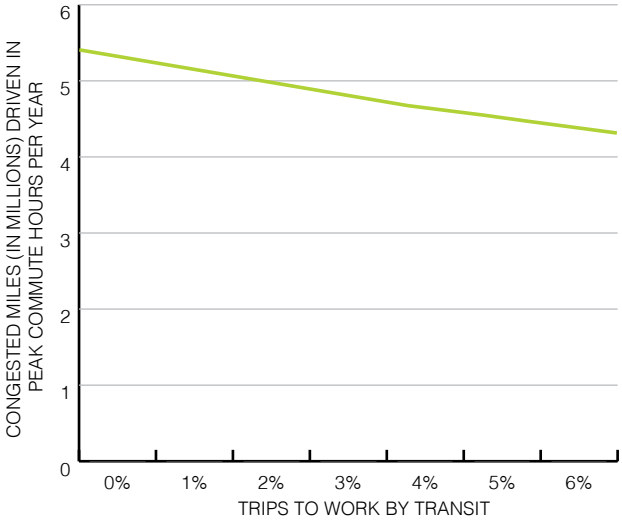
For transit, overall system productivity is usually measured by the passenger boardings per service hour provided. The more productive a route or system is, the more passengers will board per unit of service provided. All other things being equal, higher system productivity indicates a more efficient system. However, productivity does not necessarily equal cost-effectiveness.

Travel by non-motorized travel modes is also of interest, because the prevalence of travel by the major non-motorized travel modes (i.e., bicycling and walking) is a strong indicator of good land use and transportation planning. By placing complementary land uses in close proximity between residents or employees of an area, and by developing attractive, convenient pedestrian and bicycle environments, trips made by bicycle or on foot should increase. Pedestrian and bicycle access also affects the effectiveness and efficiency of transit service, as most transit trips involve walking or cycling at one or both ends. Commuters are more likely to take transit if they can easily walk or bike from their home or worksite to a transit stop or station. As a result, walking and cycling infrastructure improvements are often an effective way to support transit use. Good intermodal connections, such as convenient park-and-ride locations, on-board bike racks, secure bicycle parking, safe and pleasant access routes, and short-cuts can enhance the appeal of both non-motorized and transit modes.

A FULL DISCUSSION OF TRANSIT AND NON-MOTORIZED TRAVEL IS IN CHAPTER 5C.

Small Increases in Transit Use Help Reduce Congestion

Each 1% increase in commute transit mode share results in a 5% decrease in congested miles driven.



Supporting Active Transportation as an Option for More than Recreational Travel

The MTP/SCS includes $2.8 billion in direct investments for bicycle and pedestrian facilities to improve access, mobility, and safety in the region. This total is within 1 percent of the budget total from the 2008 MTP, but represents a per capita increase of 5 percent.

Types of bicycle and pedestrian projects in the MTP/SCS:

- Sidewalk network extensions in neighborhoods, with segments widened where needed.
- Pedestrian bridges and pedestrian intersection improvements that include ADA-compatible ramps, bulb-outs and special crossing signals.
- Bike lanes on more neighborhood and major streets.
- Multi-use bike/pedestrian trails (off-street, grade-separated) that offer residents the opportunity to make utilitarian and leisure trips separated from vehicular traffic.
- Bike facilities (racks, lockers, restrooms) at major transit stops/hubs (light rail, BRT, etc.) and at key activity centers (downtown Sacramento, shopping malls, large office complexes, etc.)

SEE APPENDIX A-1 FOR THE FULL LIST OF TRANSPORTATION PROJECTS.

Significant increases in the productivity of the transit system, with more riders and a higher percentage of total costs coming from user fares.

Transit hours increase by 42 percent per capita

Transit productivity increases by 120 percent

Farebox recovery increases to 38 percent ($577 million more revenue from passenger ticket sales)

Implementing the MTP/SCS

The MTP/SCS includes 31 policies and supportive strategies as the framework for implementing the plan. The policies are higher-level actions and the strategies are more specific actions that implement the policies. The policies and strategies are separated into four interrelated categories: Land Use and Environmental Sustainability; Finance; System Maintenance and Operations; and System Expansion. The policies and strategies are numbered for reference purposes only and do not reflect priority.

Implementation of the long-range MTP/SCS is carried out gradually through shorter-term decisions that assign local state or federal funds to specific transportation projects through periodic funding or programming cycles. By adopting the MTP/SCS, the region has taken an important step forward in prioritizing the transportation system needs over the next 25 years, and it also sets the stage for the short-term strategy to implement the MTP/SCS.

SEE CHAPTER 6 FOR THE SPECIFIC POLICIES AND SUPPORTING STRATEGIES.

Chapter 1

Building a Sustainable System

The Metropolitan Transportation Plan/ Sustainability Communities Strategy for 2035 (MTP/SCS) is an important evolutionary milestone along the path of inclusive, equitable, integrated transportation and land use, performance-based planning that SACOG began about a decade ago. As the Sacramento region's first MTP/SCS adopted under Senate Bill 375 (SB 375) and the second plan to link a regional growth pattern and smart land use principles to the transportation system, this plan has many unique features:

- an absolute reduction in the amount of heavy congestion typical residents will experience in their daily lives;
- significant increases in the productivity of the transit system, with more riders and a higher percentage of total costs coming from user fares;
- greater levels of investment in a truly multi-modal transportation system, including complete streets, bicycle and pedestrian facilities;
- better integration of future land use patterns, transportation investments, and air quality impacts, including higher levels of development near current and future transit corridors and California Environmental Quality Act (CEQA) incentives for residential and residential mixed-use projects that produce transportation and air quality benefits;
- the first phase of implementing the findings from the ongoing Rural-Urban Connections Strategy;
- providing the foundation for the next Regional Housing Needs Plan; and
- reductions in per capita passenger vehicle greenhouse gas emissions that exceed the minimum targets established for the SACOG region by the California Air Resources Board.

This plan is also the first prepared during a major, sustained national recession that has in many ways challenged California and the Sacramento region even more than the balance of the country. State budget cuts and the collapse of the residential construction sector have severely hurt two of the strongest sectors of the region's economy. This plan reflects these economic realities in a number of ways, including lower forecasted growth rates and transportation revenues than the prior plan, even more attention to land use patterns that optimize transportation performance, and dedicating scarce revenues only to those transportation investments that produce the highest performance benefits. In these ways, the plan seeks to turn the short-term challenge into a more solid foundation for long-term success for the region.

A brief summary of the major planning initiatives over the last decade that have provided the foundation for this plan follows.

2002 MTP

The first major step towards this MTP/SCS was the SACOG board's adoption of the 2002 MTP, also known as the MTP for 2025. In spite of input from a broad-based, 55-person Transportation Roundtable and preparation and analysis of plan scenarios that represented a wide spectrum of transportation priorities—from investing nearly all funds in facilities to serve automobile trips to investing nearly all funds in facilities to serve everything but automobile trips—the MTP adopted by the board forecast per capita congestion increasing by 60 percent over 25 years and worsening air quality. Nothing the planners, engineers, residents and other stakeholders tried by just varying the types of investments in the supply of transportation facilities successfully addressed the congestion and air quality challenges. As the board adopted that MTP, it was not entirely satisfied, and simultaneously committed the organization to an extensive regional transportation-land use study to determine whether integrating demand-side planning (i.e., the way the region was growing) with the traditional supply-side planning of transportation investments might deliver better results than supply-side planning alone.

Blueprint Growth Strategy

After a thorough analysis and community discussions about the trade-offs of growing through 2050 according to a business-as-usual pattern versus three alternative scenarios informed by residents, this two-year scenario planning process resulted in the SACOG board's unanimous adoption of the Blueprint in December 2004. In many ways, the Blueprint fundamentally changed the region's future.

The Blueprint planning process was based on two basic strategies: 1) develop the best scientific, objective information available about the cause-and-effect relationships between land use patterns, travel behavior, and external effects such as air quality; and 2) actively engage a broad base of residents and stakeholders with this information and seek their opinions on how they wanted their neighborhoods, communities, and region to grow. This collaborative effort to look at the future of the region brought together policy makers with residents, community groups, and private business to consider the broadest view of the future needs of the region and needs for the transportation system. SACOG quickly developed local, statewide, and national recognition for its best-in-class data and analysis and public engagement techniques.

Much of the analysis and public discussion during the Blueprint process focused on what type of housing stock the future residents of the region would prefer. A demographic forecast produced the startling finding that two-thirds of the region's growth through 2050 would be in households headed by people 55 years and older. A housing preference survey of current residents concluded that two-thirds of the current people 55 and older in the region preferred housing options that were scarce in the region at the time—attached for-sale or rental, and small-lot single family detached housing. The Blueprint also focused on the impacts of integrating rather than segregating different kinds of land uses (i.e., locating housing near job centers, schools, shopping and recreation). Dozens of interactive public workshops with over 5,000 people identified high levels of support for mixed-use development patterns that contained significant amounts of more compact housing patterns. A random sample public attitude survey confirmed these preferences.

As part of this process, SACOG built several project modeling and analysis tools, and assembled the first parcel-level Geographic Information System (GIS) database for the region. The resulting analysis demonstrated clearly that these new land use patterns, when paired with supportive transportation investments, would significantly reduce the length of automobile trips, increase transit, walk, and bike trips, substantially reduce the conversion of agricultural, natural resource and open space lands to urban development, and result in fewer air emissions than the historical growth pattern. Out of this information-based, inclusive public process, a clear consensus among residents throughout the region and the SACOG board emerged to fundamentally change the way the region grew in the future.

In 2004, the SACOG board adopted a Blueprint map with areas for future housing and employment growth through 2050, as well as future lands needed for growth after 2050, and seven Blueprint principles:

- provide a variety of transportation choices;
- offer housing choices and opportunities;
- use existing assets;
- take advantage of compact development;
- preserve open space, farmland, and natural beauty, through natural resources conservation;
- encourage distinctive, attractive communities with quality design; and
- mix land uses.

The Blueprint is a voluntary growth strategy that the Sacramento region's 28 local jurisdictions are actively encouraged to use as they make local land use decisions. At the same time the board adopted the Blueprint, a confluence of market changes driven by demographics and land prices, combined with rapidly changing local government land use policies to voluntarily implement Blueprint-consistent growth, created significant changes in the housing market, with significant increases in the number of attached for-sale and rental products as well as small-lot single family products. There were many other indicators that the market and public policy actions very rapidly began to embrace many of the Blueprint principles, including a major increase in housing planned in and around the three largest employment centers in the region and a number of local government initiatives to improve agricultural and natural resources protection in the rural areas.

For more information about the Blueprint, see Appendix E-1—Blueprint Special Report.

2008 MTP

The Blueprint provided the land use foundation for the next MTP, the MTP for 2035 (2008 MTP), adopted by the SACOG board in Spring 2008 after a two-year planning process that matched the commitment to high-quality information and extensive public engagement used during development of the Blueprint. Based on extensive input, SACOG developed multiple transportation scenarios to test which investments would perform best with a Blueprint-based future land use pattern. SACOG also implemented a more advanced travel demand forecasting tool, SACSIM (an activity-based model that operates at the individual parcel level) to assist the decision making, and added a simpler travel demand model to the land use tool for interactive use in public meetings. The 2008 MTP invested a far greater share of transportation resources in alternative modes and trip reduction than any previous MTP. The balanced transportation investment portfolio also provided for high-occupancy vehicle lanes (i.e., carpool/express bus) on freeways, bridges that shorten distances for motorists and bicyclists, and complete streets that safely accommodate vehicles, transit, bicyclists, and pedestrians.

The performance of this MTP was much better than the prior plan. Per capita heavy congestion was still projected to increase through 2035, but at a much slower rate, 19 percent instead of 60 percent. The percentage of trips using alternative modes to the automobile increased substantially, the average automobile trip length decreased, and per capita air pollution and greenhouse gas emissions were less than projected by the prior plan.

State Implementation Plan (SIP)

SACOG updated the State Implementation Plan for air quality at the same time as the 2008 MTP. This provided opportunities for much closer collaboration between the five air quality management districts in the Sacramento region in the development of the MTP. Leadership by the Sacramento Metropolitan Air Quality Management District led the U.S. Environmental Protection Agency to allow SACOG to use an MTP based on the Blueprint land use pattern as the basis for establishing that the MTP met federal Clean Air Act requirements. Several Transportation Control Measures were adopted with the MTP that committed SACOG to future actions to reduce air emissions from the transportation system, including development of a Rural-Urban Connections Strategy and analysis and policy development for parking policy and congestion pricing policies, among others.

Rural-Urban Connections Strategy (RUCS)

Soon after adoption of the 2008 MTP, SACOG launched the Rural-Urban Connections Strategy (RUCS). RUCS is designed to help implement the Blueprint through finding methods to help ensure the economic vitality of rural areas of the region, including sustainable transportation and land use, agriculture, natural resources and other uses for the rural landscape. SACOG staff began RUCS by developing detailed, parcel-specific data on the cropping patterns on the farms in the region, as well as planning and economic analytical tools to help understand the economics of farming and how infrastructure, land use and market factors affect the ability of farmers to profitably get their goods to market. SACOG has focused both on the substantial part of the region's farm economy that produces food for the nation and world, as well as increasing the share of the region's collective consumption that is grown within the region. While the project is ongoing, its initial findings are reflected in this MTP/SCS through transportation investments and policies and land use patterns that support the rural economy.

For more information about RUCS, see Appendix E-2—Rural-Urban Connections Strategy.

Senate Bill 375 (SB 375)

Six months after the 2008 MTP was adopted, a major state law was passed, SB 375 (Chapter 728, Statutes of 2008). This law was significantly influenced by the Blueprint and other smart growth scenario planning initiatives in San Diego, the Bay Area, and Los Angeles. The law integrates regional land use, housing, transportation, and climate change planning. It requires the California Air Resources Board (ARB) to set performance targets for passenger vehicle emissions in each of 18 Metropolitan Planning Organizations (MPOs) in the state for 2020 and 2035, requires an MTP to include a Sustainable Communities Strategy (SCS) that integrates the land use and transportation components, and amends CEQA to provide incentives for residential and residential mixed use projects that help to implement an MTP/SCS that meets the ARB targets.

SB 375 focuses on planning processes and incentives rather than a traditional regulatory approach. MPOs are not required to meet the greenhouse gas emission targets established by ARB, but if they conclude it is not feasible to do so, they must prepare an Alternative Planning Scenario to demonstrate what further land use and/or transportation actions would be required to meet the targets. The one new mandate in the law is that the Regional Housing Needs Allocation, a required function of the regions under separate state law, must be consistent with the adopted SCS.

The process for preparing this MTP/SCS has been significantly influenced by the new state law. The largest impacts include:

- elevation of greenhouse gas emissions as a performance metric that influences the plan;
- explicit integration of the 2020 and 2035 land use patterns in the plan with their impacts on Regional Housing Needs Allocations and transportation investments;
- preparation of an Environmental Impact Report (EIR) under CEQA that thoroughly analyzes land use impacts from the MTP as well as transportation impacts;
- explicit and thorough documentation of the land use component of the plan so that local governments can effectively determine which housing and residential mixed-use projects are consistent with the SCS and therefore qualify for CEQA relief from further analysis of regional transportation, passenger vehicle greenhouse gas emissions, and growth-inducing impacts;
- a subsequent environmental review for selected Transit Priority Areas as case studies for the region in using CEQA streamlining benefits under SB 375.
- thorough analysis and consideration of agricultural and natural resource impacts; and
- coordination of the planning processes between the four largest metropolitan areas as they all strive to meet the requirements of preparing the first regional transportation plan/SCS under the new law.

One of the primary goals of SB 375 is to enhance California's ability to reach its Assembly Bill 32 (Chapter 488 of the Statutes of 2006; hereafter AB 32) goals and reduce greenhouse gas emissions from passenger vehicles. ARB has developed greenhouse gas emissions reduction targets for passenger vehicles under SB 375. The MTP/SCS, as provided for in SB 375, is designed to provide an incentive-based approach, which provides for CEQA incentives whereby, among other things, the CEQA analysis of greenhouse gas emissions for passenger vehicles can be avoided if a project is consistent with the MTP/SCS map. The SCS recognizes and protects local land use authority and does not preclude a local jurisdiction from planning and approving growth that is different in terms of total units or geographic extent. Moreover, the SCS does not establish a threshold of significance under CEQA Guidelines Section 15064.7 or a legal presumption that a project inconsistent with the SCS does not meet greenhouse gas emissions reduction targets or AB 32 goals. In short, the SCS is a tool to address greenhouse gas compliance and it provides incentives for development projects that are consistent with the SCS. While SB 375 requires significant changes to this and future plans, the law also acknowledges local land use authority and the region's obligation to write an MTP that is consistent with federal law, including requirements that the plan be based on realistic forecasts of future revenues and land use patterns, even if doing so means the ARB targets cannot be met. Although SB 375 imposes new criteria, the fundamental transportation, land use and air quality integration that SACOG has engaged in for the past several plans comprise the core of the plan.

Related State and Federal Planning Initiatives

California Strategic Growth Council

Another state law, SB 732 (Chapter 729, Statutes of 2008), passed at the same time as SB 375, establishes an interagency Strategic Growth Council charged with aligning state policies and actions to promote sustainability and administering $90 million in planning grants for regional and local governments from Proposition 84 (2006). The Strategic Growth Council has provided funds to SACOG to assist with further upgrades to its analytical and modeling capabilities and a project to support the agriculture industry and rural communities as part of RUCS implementation.

Federal Partnership for Sustainable Communities

This MTP has also been assisted by a new federal initiative announced in 2009. The Partnership for Sustainable Communities (PSC) is between the federal Department of Transportation, Department of Housing and Urban Development, and Environmental Protection Agency. The PSC is promoting the type of inclusive, integrated regional planning that SACOG has committed to over the last decade. The initiative strives to align sometimes competing objectives of multiple federal agencies to promote sustainability within regions. SACOG received a $1.5 million grant from the PSC, primarily to assist with activating the CEQA regulatory reform benefits in SB 375 for Transit Priority Projects.

Senate Bill 391 and the California Interregional Blueprint (CIB)

Similar to requirements for regional transportation plans under SB 375, SB 391(Liu 2009) requires the State's long-range transportation plan to meet California's climate change goals under Assembly Bill (AB) 32. In response to these statutes, Caltrans is preparing a state-level transportation blueprint to articulate the State's vision for an integrated, multimodal interregional transportation system that complements regional transportation plans and land use visions. The CIB will integrate the State's long-range modal plans and Caltrans-sponsored programs with the latest technology and tools to enhance the state's ability to plan for and manage the transportation system.

Conclusion

This MTP/SCS is another important milestone in SACOG's commitment to inclusive, integrated, performance-based transportation and land use planning. This update is the first that is titled an MTP/SCS. This labeling is purposeful. SACOG views the SCS not as a separate and distinct element of the plan, but rather integral to the entire document, influencing the land use patterns which form the foundation for transportation investments, the subsequent Regional Housing Needs Plan, and compliance with federal air quality and state greenhouse gas emissions requirements; identification and consideration of the impacts of the plan on environmental justice areas, natural resources and agricultural lands; and the action element that determines how the plan will be funded and implemented. All of these features further improve the quality of this plan update compared to prior updates, and are a further evolution along a path of implementing the Blueprint growth vision for the region that the SACOG Board of Directors established nearly a decade ago.

Chapter 2

Planning Process

Why Does SACOG Prepare a Metropolitan Transportation Plan?

SACOG is designated by the state and federal governments as the Metropolitan Planning Organization (MPO) and responsible for developing a regional transportation plan every four years in coordination with Sacramento, Yolo, Yuba, Sutter, El Dorado and Placer counties and the 22 cities within those counties (excluding the Tahoe Basin). The plan incorporates county-wide transportation planning developed by the Placer County Transportation Planning Agency and the El Dorado County Transportation Commission, under memoranda of understanding (MOUs) between those agencies and SACOG.

The regional planning area is shown in Figure 2.1. Portions of the planning area are designated as federal non-attainment areas for ozone and particulate matter. For the region to be eligible to receive federal transportation funds, the region's transportation system must be able to show a steady decrease in pollution emissions until the area's air is clean enough to meet federal air quality standards.

Transportation systems are best planned at a regional level because people don't confine their trips to a single physical jurisdiction. Federal law established regional agencies for the purpose of area-wide transportation planning in 1962 so that planning for highways, roads, and public transit would be comprehensive and cooperative between local agencies and governments.

Federal law requires the long-range regional transportation plan to cover at least a 20-year planning horizon, and be updated at least every four years. This plan, the Metropolitan Transportation Plan/Sustainable Communities Strategy for 2035 (also referred to as the MTP/SCS or the plan) covers the period from 2008 to 2035 and is an update to the Metropolitan Transportation Plan 2035 that was adopted in 2008.

This MTP/SCS provides the regional vision for surface transportation with considerations for land use and funding constraints the region can reasonably expect to see through 2035. The plan takes an integrated approach to transportation and land use, and their impacts on air quality and climate change.

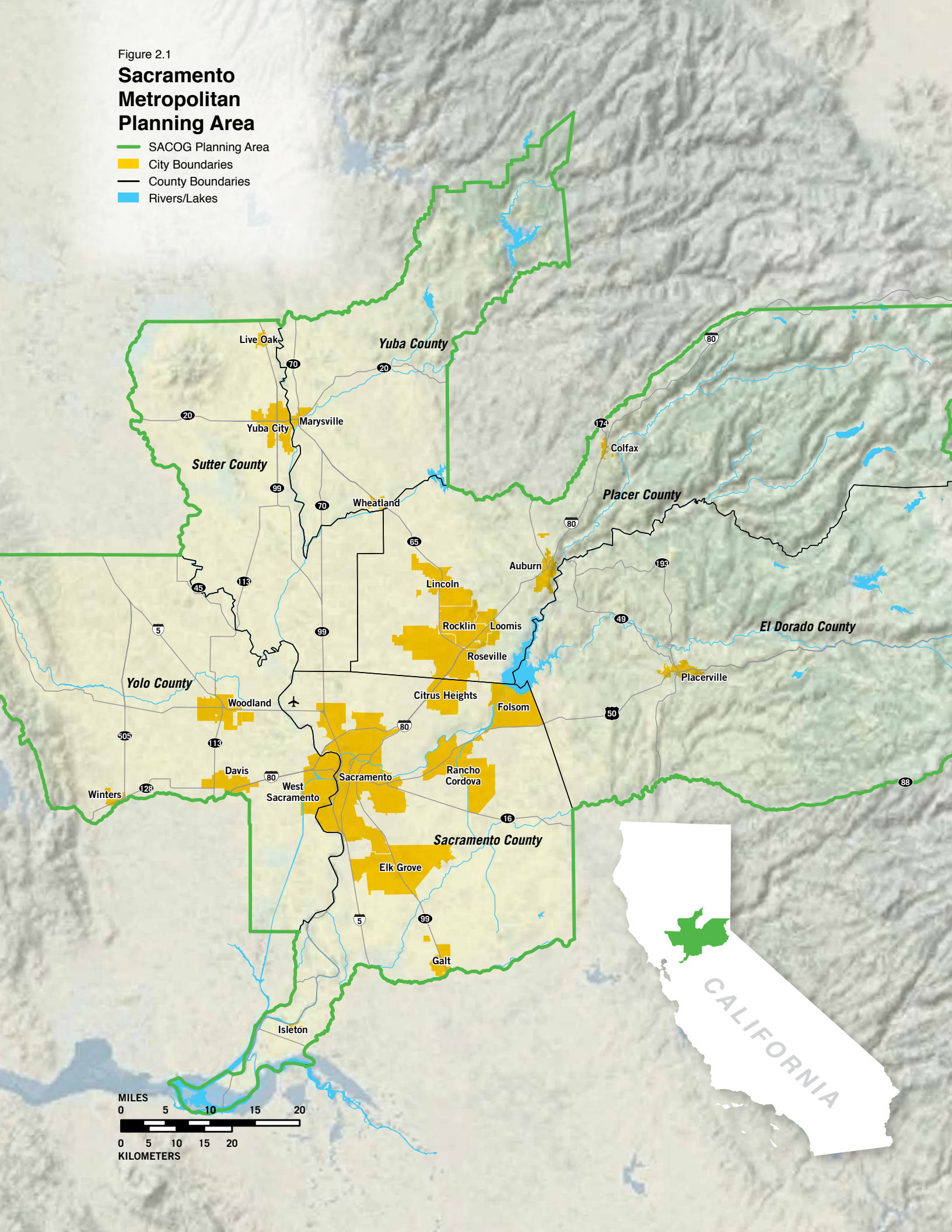
If a city, county, or public agency in the region wants to use federal transportation funding for projects or programs, they must be included in the MTP/SCS project list. The MTP/SCS represents transportation improvements and investments that will serve the projected land use pattern and population growth forecasts in the Sacramento region in the near and long term. All transportation projects that are regionally significant for potential air quality impacts must be included in the MTP/SCS, as well as those projects with federal transportation funds. SACOG worked collaboratively with local government planning and public works departments, transit service providers, air quality management districts, transportation departments, and residents across the region to develop the land use forecasts and transportation system for the MTP/SCS.

In order to comply with Senate Bill 375 (SB 375) and federal regulations, the MTP/SCS must be adopted by April 2012 in accordance with the four-year cycle requirement. Failure to adopt this plan, or any future MTP/SCS, within the four-year timeframe could result in a lapse in federal air quality conformity requirements. Such a lapse in conformity could make the region ineligible for certain types of funding, including one-time competitive funds. In addition, the MTP/SCS is updated on a federally regulated cycle of at least every four years. The planning work for the next update cycle typically starts approximately two years after the current MTP/SCS is adopted.

A complete description of planning regulations and laws is in Appendix G-5- Regulatory Framework for the MTP/SCS.

Figure 2.1

Sacramento Metropolitan Planning Area



How Was this Plan Created and Who Was Involved?

The Plan Development

The SACOG Board of Directors, in its policy role overseeing long-range transportation planning in the region, is ultimately responsible for this plan. The board considered recommendations from SACOG policy committees, advisory committees, local agencies, focus groups, residents and SACOG staff, and actively deliberated on the plan during all stages of development. In addition, regional public works agencies and transit operators participated in the technical screening process that was based on ongoing Congestion Management Process (CMP) activities. A full discussion of CMP activities is in Appendix C-3.

The development of the MTP/SCS began in 2009 and can be generally divided into four core planning phases, each inclusive of public participation, jurisdiction coordination and consultation and regular updates to the SACOG board. The four areas are:

- Developing a New Regional Growth Forecast;
- Applying the New Regional Growth Forecast to Develop the Land Use Forecast
- Integrating the Transportation System for the Land Uses; and
- Developing a Metropolitan Transportation Plan/Sustainable Communities Strategy.

Developing a New Regional Growth Forecast

A new regional growth forecast for the MTP/SCS was adopted by the SACOG Board of Directors in June 2010. The new growth forecast reflected a downward shift in population, housing and employment growth; additionally this MTP/SCS shows less funding forecasted than the 2008 MTP. The downward trend in growth creates a shift in how the region will reasonably expect to grow over the 27 years (2008–2035) of the plan. A full discussion of the technical work to develop the regional growth forecast occurs in Chapter 3.

Applying the New Regional Growth Forecast to Develop the Land Use Forecast

With the new growth forecast, SACOG works with member jurisdictions to allocate where growth is likely to occur during the years of the plan. SACOG consults with local governments in the region as it considers a number of factors throughout this process: existing local, state and federal policies and regulations; general plans; spheres of influence; community and specific plans; land division and development codes; natural resources constraints; and design guidelines. Early in the MTP/SCS development process, SACOG met with staff from each member jurisdiction to discuss the plan process, milestones, and coordination for incorporating the most recent local plans and policies into the regional land use assumptions. The SACOG Planners Committee[1] was the primary venue for regular coordination between local agency planning staff and SACOG; however, a number of jurisdiction-specific meetings and five comment periods for member jurisdictions were also held. A full discussion of technical work to develop the land use forecast occurs in Chapter 3.

This work with local jurisdiction staff led to the development of a draft land use forecast that allocated growth into four types of communities. The four Community Types are Center and Corridor Communities; Established Communities; Developing Communities; and Rural Residential Communities. While directing growth to the different community types, the land use map also considers Lands Not Identified for Development in the MTP/SCS planning period. It is important to note that even though SACOG develops a land use map and recommendations for new growth, the decisions on when, where, and how to develop lie solely with the local jurisdictions. A full discussion of the Community Types and the supportive technical work is in Chapter 3.

Integrating the Transportation System with Land Uses

The reduced growth and revenues forecasted for the MTP/SCS necessitated a more limited package of transportation projects. As a result, certain projects, while still in the plan, had to be planned for later years of the plan and others were right-sized, or value-engineered. Through consultation with local agency staff, a focus was made to identify transportation investments that achieved high cost-effectiveness and strong performance benefits in spite of lower overall funding levels.

The Community Type land uses underpin a transportation network that is notably different from previous MTPs. Mobility options are matched to the land uses and there is an emphasis on system maintenance and operational

1 A 28-member committee consisting of the planning directors or their designees of each of SACOG's member jurisdictions. The committee was originally formed to advise SACOG on the development of the Blueprint Project and is now advising on all land use related items. This committee meets monthly (or as needed) and received monthly updates regarding the MTP/SCS update throughout the process. The Planners Committee is open to the public, and noticed on the SACOG website.

improvements over capacity projects. With this new focus, a broad range of elements comprise the transportation system and investments in the MTP/SCS:

- maintenance and rehabilitation of existing and future facilities;
- operations and strategic expansions of public transit;
- strategic road and highway expansion and operational improvements that focus on alleviating major bottlenecks and congestion points;
- bicycle and pedestrian retrofits and new facilities; and
- programs and planning (i.e., Blueprint-supportive programs and transportation system management strategies, including technology and demand management programs, which allow for greater optimization of existing transportation infrastructure).

Regular updates on staff work to develop the MTP/SCS, including the project list, and opportunities to comment were given to the SACOG Board of Directors and to local jurisdiction staff beginning in 2009 through 2011. The integration of the growth forecast into a land use forecast, the development of Community Types, and integration of the transportation system set the stage for development of the MTP/SCS.

The aforementioned work of developing a regional growth forecast, applying that growth to regional land uses, and integrating the transportation system is a key part of complying with SB 375. This work, although new as a state requirement, is not new to the data- and stakeholder-driven MTP planning process in the Sacramento region. The coordinated land use and transportation planning envisioned by SB 375 is consistent with the type of planning that started with the Blueprint and the 2008 MTP. Rather than initiating a new approach, the inclusion of the SCS will serve to further integrate the Blueprint and MTP by tying the plan's performance to greenhouse gas (GHG) reduction targets through reduced auto travel and increased walking, bicycling and transit use. This integral relationship between the MTP and the SCS is reflected in the plan being titled the MTP/SCS.

Developing a Sustainable Communities Strategy

In accordance with SB 375, the plan must include a Sustainable Communities Strategy (SCS) that demonstrates how the Sacramento region can coordinate land use and transportation planning to reduce vehicle miles traveled from cars and light duty trucks and meet the California Air Resources Board (ARB) GHG reduction targets. If the SCS cannot achieve the targets, an Alternative Planning Strategy (APS) must be developed to demonstrate how the targets could be achieved. A discussion of SB 375 is in Chapters 1, 3 and 7.

In April 2010, the SACOG Board of Directors directed staff to use the following principles for setting the region's GHG reduction targets to comply with SB 375:

- "Use performance metrics to guide this MTP in a variety of areas (i.e., not just GHG emissions), including reducing per capita congestion, vehicle miles traveled, environmental impacts; and increasing modes of travel other than single occupancy automobile use, safety, goods movement, and accessibility of SACOG's diverse population to transportation services. The SB 375 greenhouse gas emissions reduction target will be one of several performance metrics addressing key policy goals."
- "Performance goals should be established based on up-to-date forecasts and assumptions about future population, employment, and demographic trends. All future performance goals should take account of current performance, based on the most reliable regional data sources. The last five years have shown that key factors like the economy and fuel prices can change rapidly and unpredictably. The performance metrics should be established after evaluating sensitivity analyses on these uncertain factors, and key assumptions should be clearly documented to allow for monitoring and updating for changing conditions in the future."
- "Performance goals should be consistent with the Blueprint smart growth principles and should maximize the opportunities for new California Environmental Quality Act (CEQA) reform benefits included in SB 375 to help the region implement the Blueprint principles."
- "Performance goals should be based on reasonable assumptions that federal, state, local and private funding will identify and implement funding sources sufficient to build and operate a functional, effective transportation system for all modes of travel (i.e., it should not assume that current downturns in transportation funding sources continue for the next 25 years). However, the impacts of failure to secure adequate funding levels should also be considered and clearly identified."
- "Performance goals should be realistic in targeting greater success and better performance in later years (i.e., 2035) than in early years (i.e., 2020)."
- "Given funding challenges and federal requirements related to financial and land use constraints, it may be necessary for SACOG to adopt a tiered MTP in 2011, with a base plan and a preferred plan. The base plan would be the officially acknowledged plan for federal air quality conformity and other purposes and may fall short on some of the performance goals, including the SB 375 targets. The preferred plan would reflect the region's aspirations of the type of transportation system it wants to construct and operate and the land use pattern it wishes to build. The preferred plan would be expected to have superior performance and may also be an alternative planning scenario (APS) under the terms of SB 375."

In September 2010, the ARB set reduction targets for the Sacramento region of 7 percent per capita GHG by 2020 and 16 percent per capita GHG by 2035. A full discussion of these targets and the MTP/SCS's achievement of them occurs in Chapter 7.

MTP/SCS Scenario Development and Testing

In accordance with SB 375, the SACOG Board directed staff to develop three regional land use and transportation scenarios to seek public input on the investment priorities for the MTP/SCS, and to test the different performance benefits of varying land uses and transportation investment packages.

In June 2010, the SACOG board directed staff to develop three MTP/SCS scenarios. The three scenarios, which are known as Scenario 1, Scenario 2 and Scenario 3, were designed to allow for analysis of truly distinctive alternatives within the bounds of the type of land development and transportation investments that could realistically be expected to occur over the MTP/SCS planning period. All three scenarios were built from the same regional employment, population and housing growth projections and the same transportation budget, financially constrained in accordance with federal transportation regulations. Land use patterns and the transportation system were designed together to create each scenario. Land use and transportation variables varied in the following ways:

Land Use Variables:

- The amount of compact development—compact development has been shown to be more effectively served by transit, to support potentially higher rates of walking and biking, and to generate lower vehicle travel. This variable is measured in terms of housing product mix (the mix of high and low density housing units) and amount of development occurring in existing developed versus undeveloped areas.
- The amount of development in high-quality transit corridors, where residents are more likely to use available transit.
- The amount of complementary, mixed-use development, which supports shorter vehicle trips and higher rates of non-motorized travel.

Transportation Variables:

- The location, intensity, and type of transit service, based on the extent of transit-supportive land uses in corridors. Higher-density, mixed-use corridors provide greater opportunities for higher-capacity transit, such as light rail, streetcars, and Bus Rapid Transit (BRT).
- The amount, location, and type of investment in complete streets projects, which serve multiple users in locations where land use generates a mix of travel modes.
- The extent and location of roadway and other projects to alleviate major bottlenecks and congestion points and the extent to which investments were included to alleviate existing bottlenecks, compared to reserving investments for future bottlenecks.
- The level of investment in Blueprint-supportive programs and transportation system management strategies, including technology and demand management programs, that allow for greater optimization of existing transportation infrastructure. More compact and mixed-use development patterns can allow some shifts in investment priorities away from road extensions and expansions to improving the function of existing roads for multi-modal travel.

The land use components of the scenarios were designed in a progression from most dispersed development pattern to least dispersed development pattern; the corresponding transportation components followed a progression of most auto-oriented transportation system to most multi-modal transportation system. The scenarios are described according to this progression in Table 2.1.

A detailed description of the scenarios and the scenario development methodology is also included in Appendix G-1—Public Workshop Scenarios and Workshop Results.

Table 2.1
Description of MTP/SCS Land Use and Transportation Scenarios

Scenario	Land Use	Transportation
Scenario 1	• Smallest share of new compact housing[1] (61%, same as 2008 MTP) • Smallest share of growth in Transit Priority Areas[2] (20% of new homes, 26% of new jobs) • Most dispersed development pattern/highest amount of developed acres	• Least amount of transit service, mostly in the form of shuttles, commuter bus, fixed route bus • Least amount of BRT, streetcar and light rail transit (LRT) • Highest amount of new roads and road expansions • Least amount of road maintenance and rehabilitation • Least amount of bicycle and pedestrian street and trail projects
Scenario 2	• Higher share of new compact housing[1] (68%, same as Blueprint) • More growth in TPAs[2] • Less dispersed development pattern than Scenario 1/ fewer developed acres	• More transit service than Scenario[1] • More BRT, streetcar, and LRT than Scenario[1] • Less new road capacity and road expansion than Scenario[1] • More road maintenance and rehabilitation than Scenario[1] • More bicycle and pedestrian street and trail projects
Scenario 3	• Highest share of new compact housing[1] (75%) • Highest share of growth in TPAs[2] • Least dispersed development pattern/ fewest developed acres	• Highest amount of transit service • Highest amount of BRT, streetcar and rail • Least amount of new roads and road expansions • Same road maintenance and rehabilitation as Scenario[2] • Most bicycle and pedestrian street and trail projects

[1] Compact housing is defined as small-lot single-family (8 to 25 dwelling units per acre) and attached residential (attached single-family or multi-family homes ranging from duplexes, triplexes, lofts, apartments, condominiums, townhomes, row houses, halfplexes, etc., built at densities from eight to over 50 dwelling units per acre.)

[2] Transit Priority Areas (TPAs) are defined as areas within one-half mile of a rail station stop or a high-quality transit corridor. A high-quality transit corridor has fixed-route bus service with service intervals of 15 minutes or less during peak commute hours.

Public Involvement

In 2009, before beginning the MTP/SCS process, SACOG developed a Public Participation Plan (PPP) as a guide to effective public involvement and in compliance with federal and state requirements. The PPP provides direction for public involvement activities conducted by SACOG and contains the procedures and strategies used by SACOG. From February-April 2011, SACOG prepared the annual amendment to the PPP with outreach to stakeholders representing social equity, bicycle and pedestrian, transit, environmental, transparent government, and smart growth interests. These groups helped to frame the optional activities to consider for outreach in addition to the required activities. The SACOG Board approved the annual amendment in June 2011. The full PPP is located in Appendix 2— Public Participation Plan.

Focus Groups

The first public education and engagement activities for the MTP/SCS started with focus groups in the spring of 2010. Developing an effective regional transportation system requires understanding the needs of our region's residents and the travel choices they will want and need to make. SACOG developed the MTP/SCS with a broad public involvement process, including focus groups, working groups, and community workshops within each of the six counties in the region, from the summer of 2010 through the end of the planning process.

The focus groups expanded from the prior MTP development process to include a more diverse group of stakeholders. The objectives of the focus groups were to: 1) introduce SACOG and its mission to stakeholders not familiar with the organization; 2) inform them about the role of the MTP/SCS and some of the new and existing issues the region is facing; 3) hear new and existing stakeholder feedback on different general directions that SACOG should explore for the MTP/SCS and how it affects the world that these stakeholders represent; and 4) create networking opportunities for traditional stakeholders and groups that SACOG had not worked directly with before.

In addition to communities of concern (i.e., low-income, senior, youth, disabled, and minority groups), active transportation and environmental advocates, and the development community SACOG focus groups sought input from a variety of stakeholder groups representing diverse constituencies and interests in our region's growth and transportation system, including:

- affordable housing
- agriculture
- climate action planning
- land development
- clean energy
- economic development
- education
- environment & transportation advocates
- equity, public health & human services
- faith-based & community-based organizations
- goods movement & freight
- redevelopment & community development
- seniors & aging populations
- state & federal agencies
- water resources & infrastructure

Yuba & Sutter counties The 16 focus group meetings and two follow-up sessions provided opportunity for robust dialogue around the needs and demands our region will put on our regional transportation system, from the special needs of those who cannot drive to those who travel through our region to transport goods via heavy-duty trucks or trains to ports. The focus groups created a leveraging opportunity to extend staff capacity by engaging new partners in outreach from the focus group participants to their service and interest networks.

The focus group meetings were conducted in two parts: the first focus group meetings focused on explaining SACOG and its work to new stakeholders and prioritizing potential new performance measures for use in evaluating the MTP/SCS. These focus groups included a presentation on regional transportation planning, technical modeling, assumptions and forecasting, methodology for meeting the GHG target, funding forecasting and constraints, and federal and state statutes that frame the MTP/SCS. Table 2.2 shows the first series of focus groups, number in attendance and location of meeting. Each participant represented a significant membership or constituency.

Table 2.2
MTP/SCS Focus Groups Round 1 Participation Summary

Stakeholders	# Participants	Location
Affordable Housing	10	SACOG
Environment	8	SACOG
Equity, Health & Human Services	7	SACOG
Development	7	North State Building Industry Association
Water	8	SACOG
Clean Energy	9	SACOG
Goods Movement	8	SACOG
Economy	12	SACOG
Climate Action Planners	8	SACOG
Redevelopment & Community Development	7	SACOG
Senior & Aging	9	SACOG
State & Federal Agencies*	3	SACOG
Agriculture	11	SACOG
Education	8	SACOG
Faith & CBO	5	SACOG
Yuba & Sutter	3	Yuba County Government Center

The most significant outcome from the first series of focus group meetings was participant input on the performance metrics to consider as priorities in developing the MTP/SCS. The participants were given a list of potential new measures for which SACOG felt there could be adequate data at a regional scale to support inclusion in the MTP/SCS. Participants were asked to use a total of five votes to prioritize the list. The participants could use all five votes on one measure, or split across multiple measures. Additionally, if the participants did not feel any of the new measures were a priority, they could elect to not vote. Participants were further asked to make recommendations on additional measures to be assessed for inclusion in the MTP/SCS.

Information collected during these focus groups was summarized for board committee and staff discussion during the summer and fall of 2010. The key finding was overwhelming interest in measuring Mix of Uses; this measure received the highest number of votes at 91. The next highest priority was Percent of New Housing Units and Job Growth within ½-mile of high-frequency transit. Both of these measures were categorized in the Smart Land Use principle for the MTP/SCS. The third-highest measure at 52 votes was Acres of Farmland Lost to Development within the Environmental Quality and Sustainability principle. Participants were not asked to prioritize interest in the new GHG measure, as it was required of SACOG to address. Input was sought from participants on what new optional measures should be prioritized.

Recommendations of the focus groups for new performance measures are shown in Table 2.3. The full list of measures prioritized and additional recommendations by the focus groups are in Appendix G-3. Also in the appendix are individual focus group summaries that show how the group voted in comparison with all focus groups and narrative discussion highlighting key comments by each group. Several of these performance measures were used to describe the three MTP/SCS scenarios discussed at the public workshops described below; however, many more performance measures are also used to describe the performance of the plan. Performance measure outcomes are discussed in Chapters 3, 5, 7, 8, 9 and 10. A complete list of all of the performance measures used in the MTP/SCS is in Appendix G-6.

Table 2.3
Recommendations of Focus Groups for New Performance Measures

Category	New Performance Measures
Transportation	
Vehicle miles traveled (VMT)	Number of passenger vehicle miles traveled (i.e., cars/light-duty trucks) per capita
Congestion	Number of vehicle miles traveled per capita on congested roadways
	Number of hours of travel delay per capita, or per traveler
Transit ridership	Number of transit trips per capita
	Number of transit passenger boardings per capita
Carpooling	Percent of work trips by carpool
Bicycling and walking	Number of bike and walk person trips per capita
	Percent of work/school commute trips by bike/walk
Transportation emissions	Greenhouse gases emitted per capita, relative to year 2005 per capita
	Total greenhouse gases emitted, relative to year 2005 Total
Transit productivity	Number of passenger boardings per vehicle service mile, split by light rail vs. different bus types
Population and Employment Change	
General Growth	Adding several interim years to population growth from 2008 to 2035
	Adding several interim years to housing growth from 2008 to 2035
	Adding several interim years to job growth from 2008 to 2035
Demographic Changes	Information on changes in age, income, and other household demographics
Blueprint Growth and Change to Urban Form	
Accessibility	Percent of jobs within 20-minute commute of households
	Percent of jobs within 45-minute transit ride of households
Mix of Use	Residential mix index (0–100 scale)
	Employment center mix index (0–100 scale)
Transit-Oriented Development	Percent of housing and job growth in high-frequency transit service areas
Agriculture and Natural Resources	Number of acres and percent? of farmland affected by development
	Number of acres and percent? of natural resource lands affected by development
Economic Vitality	
Total Cost of Travel	Cost per capita of travel and auto ownership (includes cost of auto ownership, auto maintenance and operation, transit fare, parking costs)
Commercial Vehicle Congestion	Congestion on freeways and major commercial vehicle routes
Equity and Choice	
Exposure to Traffic Growth[1]	Percent of population near high-traffic roadways, split by environmental justice and all other areas
Safety and Health	
Collisions	Collisions per vehicle mile traveled
Safe Routes to Schools	Percent of school-age children living within bike/walk distance of a school

[1] This measure was included in the environmental justice analysis in Chapter 8; however, the science behind exposure to high-traffic roadways is still evolving. Please see page 210 for issues in measuring this metric. Many other performance measures are important to environmental justice. For this reason, a full suite of environmental justice measures are described in detail in Chapter 8 as well.

The focus group participants were asked to attend one of two follow-up meetings, with identical content. At the follow-up meetings, participants were presented with the results from all focus groups and SACOG's recommendations for new measures, asked for feedback, and held discussions around feasibility of certain measures (because of time and data constraints, all proposed measures were not able to be included in the MTP/SCS). The follow-up sessions also included a presentation and feedback opportunity on the draft GHG target methodologies and scenarios. The follow up sessions also asked participants to preview and offer feedback on the content, exercises, and materials for the MTP/SCS public workshops, held in October 2010. Lastly, as with the initial meetings, SACOG asked focus group participants to support outreach, education and engagement for the workshops by including the MTP/SCS information provided by SACOG in their communications, sharing potential contacts, assisting in coordinating presentations in advance of the workshops, and sharing workshop information with their contact lists.

The agencies and groups represented at the follow-up meetings were:

- Area 4 Agency on Aging
- Brookfield Land Co. (2)
- City of Davis
- City of Sacramento
- Coalition on Regional Equity
- Environmental Council of Sacramento
- Gray Panthers
- Legal Services of Northern California
- Mackay & Somps
- Older Women's League of California
- Placer County Office of Education
- Sacramento County Adult & Aging Commission
- Sacramento Housing Alliance
- The Nature Conservancy
- U.S. Environmental Protection Agency Region 9

Environmental Justice Focus Groups

SACOG also undertook significant public attitude research for the MTP/SCS. With the support of Caltrans and MIG (a planning consulting firm), research included eight environmental justice focus groups with minority and low-income populations in the region. These focus groups, conducted in November 2010, allowed SACOG to compare changing needs and priorities with outcomes of similar focus groups held in March 2007 to help guide development of the 2008 MTP. A more detailed summary of the process and results of the 2010 focus groups is in Appendix G-3. Eighty-nine residents participated in the focus groups, summarized in Table 2.4.

Table 2.4

Environmental Justice Focus Groups

Focus Group	# Participating	Language	Location
Asian-Pacific Islander	15	English with Vietnamese/ Mandarin interpretation	Sacramento
African American	12	English	Sacramento
Low Income #1	11	English	Yuba City
Low Income #2	16	English	Sacramento
Native American/American Indian	12	English	Sacramento
Hispanic/Latino #1	7	Spanish	Sacramento
Hispanic/Latino #2	7	Spanish	Woodland
Low Income #3	9	English	Placerville

Focus group members were asked to identify their funding priorities to improve transportation in the Sacramento region. Participants prioritized funding projects to provide bicycle lanes, sidewalks and safer neighborhood streets, to improve public transit services, and to fix local streets and roads, dovetailing with the results of MTP/SCS county workshops and other focus groups.

The environmental justice focus group participants were also asked to imagine themselves, their family and the Sacramento region in 20 years, and provide their hopes and predictions for the region's future transportation system. Common visions were:

- The Sacramento region will support a comprehensive transportation system that provides transportation opportunities throughout the region.
- There will be positive improvements in public transit services, road, bicycle and pedestrian facilities.

Additional Outreach

In addition to the various focus groups since the start of the MTP/SCS planning process, SACOG staff participated in over 130 meetings to get input from a broad range of residents, advocates, jurisdiction staff and other stakeholders in the region. A full list of presentations is in Appendix G-4.

As referenced above, the PPP guides public participation and set the framework for Native American Tribal Government input on the development of the MTP/SCS. Section four of the PPP describes the process for SACOG's work with tribal governments as well as recommended strategies for gathering input. In advance of the October 2010 public workshops, SACOG reached out to the Native American tribal governments with land holdings within the region. SACOG met with representatives of the Yocha Dehe Wintun Nation and United Auburn Indian Community (UAIC) to discuss to discuss and provide information on the plan and the public workshops. The tribal representatives gained an understanding of the regional process for development of a high-performing transportation priority project list based on modeling. Uniquely, UAIC works with Placer County Transportation Planning Agency on local transportation plans and investments within Placer County that are incorporated into the regional plan.

MTP/SCS Public Workshops

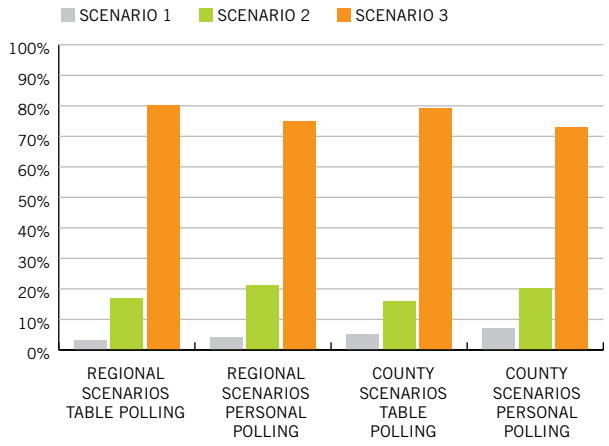
At the nine county-level workshops in October 2010, participants were given a regional map and a county map with performance information from computer modeling associated with specific transportation investment and land use packages. The maps also included visual representations of the four Community Types. Accompanying information about the performance of each scenario at the county and regional scale was presented for consideration along with the visual representations for workshop participants to consider. A regional scorecard was also provided to allow for side-by-side comparison of performance measures and outcomes by scenario. The full scorecard and MTP/SCS workshop materials are available in Appendix G-1.

Workshop participants were provided the opportunity to have group discussions about the different performance outcomes of each scenario with other concerned residents present at the workshops. Participants were encouraged to deliberate on the issues facing the region related to the transportation system and related land uses. Each participant was also asked to share their preferences for personal travel choice and what if anything would influence changing their current travel patterns.

Polling questions related to personal preference among the scenarios at the county and regional scale were asked at the workshops. While the full spectrum of polling results is included in Appendix G-1, the overall results of scenario voting are represented in Figure 2.2. The responses from the nine workshops in the region show a preference toward Scenario 3, which of all three scenarios had the highest: percentage of growth in Center and Corridor Communities; growth in attached homes; increase in transit service and funding; percent of new jobs and housing and homes in environmental justice areas near high-quality transit; and increase in miles of bicycle paths, lanes and routes. The participants in workshops in Sutter and Placer Counties expressed greater levels of support for Scenario 2.

Figure 2.2

Regional Results of MTP/SCS Workshop Polling on Scenario Preference



For the regional workshops, SACOG had the opportunity to partner with a community-based organization to provide unique outreach to limited and non-English speakers. Asian Resources, Inc. (ARI) provided translation of print materials into Vietnamese and Russian. Additionally, their staff attended the workshops and provided real-time interpretation services. ARI is a community-based non-profit dedicated to providing a wide spectrum of social services to low-income and limited English speaking youth, immigrant and refugee communities in Sacramento, as well as re-entry clients.

Detailed information on the workshop results is in Appendix G-1. Being a geographically large region, SACOG is aware that not all residents could attend a workshop in person. SACOG posted videos and materials from each workshop on the SACOG website and provided print materials on request to those unable to attend. SACOG staff also fielded a number of phone calls in order to assist residents with questions, and to record comments on the scenarios.

MTP/SCS Draft Preferred Scenario Development

Throughout the public workshops, public opinion research, focus groups and media outreach, SACOG heard public interest in a balanced investment package including improvements in road maintenance, road expansion, transit service expansion, and facilities for bicyclists and pedestrians and an understanding of the types of transit investments that can be cost-effective in different community types, as exemplified in the focus group performance measure recommendations shown in Table 2.3 and the public workshop results shown in Figure 2.2.

In December 2010, based on the results of the public workshops and focus group input, the SACOG Board of Directors adopted a framework to create a Draft Preferred Scenario of transportation investments and land use growth assumptions to underpin the MTP/SCS, based on Workshop Scenario 3, with elements of Scenario 2 for Sutter and Placer counties. The framework provided policy and process guidance to staff, local agencies and stakeholders for creating a Draft Preferred Scenario. The framework directed SACOG staff to develop a land use pattern and transportation system for the MTP/SCS that improved upon the transportation performance of the 2008 MTP. The SACOG board endorsed the Draft Preferred Scenario after multiple iterations of the scenario methodology described in more detail in Appendix E. Information on the land use forecast of the MTP/SCS is in Chapter 3.

This MTP/SCS continues to draw investment priorities from the six board-adopted MTP/SCS Principles: access and mobility, equity and choice, economic vitality, environmental quality and sustainability, financial stewardship and smart land use. Public input from the MTP/SCS workshops indicated strong public support for concentrating growth in Center and Corridor Communities and increasing investment in transit and complete streets.

With the funding provided by the U.S. Department of Housing and Urban Development (HUD) described in Chapter 1, SACOG was able to do work to understand resident needs for complete communities with transit access. This work centered on Transit Priority Areas (TPA) in the plan. TPAs are areas within a ½-mile of a rail transit stop or 15-minute transit service during traditional commute hours.

To implement the HUD grant, SACOG started a Regional Consortium for Sustainable Communities that includes working groups on economic development; equity, housing and health; infrastructure; and natural resources. The Consortium and working groups explored a more in-depth view of opportunities to increase access to employment, housing and transportation choices in five distinct TPAs. The working groups helped to frame priorities and indicators in their topic areas to be measured and assessed in the selection of five Transit Priority Areas studied as part of the grant. This input also informed the performance measures for the MTP/SCS, discussed in more detail in Chapter 8—Equity and Choice.

Development of the MTP/SCS also involves hearings and local government information meetings during circulation of the draft MTP/SCS that satisfy the public outreach requirements of SB 375 and SACOG's PPP.

Technical Analysis & Congestion Management Process

As part of the MTP/SCS development and ongoing Congestion Management Process (CMP) efforts, technical committees comprised of local public works agencies and transit operators made specific recommendations considered by the SACOG Board of Directors. Input was also incorporated from SACOG advisory committees, including the Regional Planning Partnership, the Transit Coordinating Committee, the Bicycle and Pedestrian Advisory Committee, the Transportation Demand Management (TDM) Task Force, and the Planners Committee.

Collaborations between local jurisdiction staff and agency partners included the development of regional-scale land use and transportation scenarios that the SACOG board directed staff to develop for use in the MTP/SCS public workshops described above. The range of investments was taken from existing plans and new proposals developed through agency collaborations. The scenarios reflected different emphases on specific investments in roads, transit, bicycle and pedestrian modes, and transportation programs and each specific land use patterns based on new population growth estimates through 2035.

At the workshops, SACOG provided results of three investment scenarios (informed by the previous focus groups and market realities) and a variety of CMP performance measurements. These measures, consistently reported across the scenarios, included percentage of travel by mode, vehicle miles traveled per household, vehicle miles traveled per household in congestion, transit share of commute trips, and other statistics related to new miles of roads, rail transit and bus transit. The performance measurements were made available in electronic and print formats for review by the general public, agency partners and the SACOG Board.

Communication between SACOG and local agencies over the course of the MTP/SCS development led to a project list that was more financially constrained than in previous MTPs with consistent performance measures to track through ongoing CMP efforts. Local agency plans were reviewed by SACOG staff during 2009 for the purpose of studying and developing plan alternatives, and again in early 2010, when agencies were asked to nominate projects through a call for projects to request scopes, costs, and schedules as well as priorities and information on developer-funded projects. Because the regional plan takes into account local funds—including developer fees and developer-built projects—as well as regional, state, and federal funds, projects that local agencies submitted were considered through multiple rounds of review.

SACOG analyzed projects nominated by member jurisdictions against the priorities identified through the public outreach activities, technical performance, and financial constraint requirements. SACOG fit as many member jurisdiction priorities as possible into the plan, given the constraint of reasonably expected revenues and a more fiscally constrained budget than the 2008 MTP. The result was a draft staff recommendation that reflects strong performance and financial realities.

SACOG provided the technical analysis for the plan, prepared materials for the MTP/SCS workshops, recruited facilitators from agency partners, met with interest groups, and the public, and in the end drafted the MTP/SCS for the SACOG board. The staff also prepared:

- Financial forecasts of amounts and types of funds expected to be available between 2011 and 2035. Federal statutes require that regional transportation plans be limited to improvements that can be afforded with funds reasonably expected to be available. Issues arising from the forecasting of and limitations on funding are discussed in detail in Chapter 10 on Financial Stewardship and Appendix B-1.
- Information from the regional transportation model and other data sources to allow evaluation of the impacts of changes to the transportation system. Chapter 3 and Appendix E-3 provide the assumptions that are used for the land use forecast. Chapter 5 details the results of the transportation modeling performed for this plan.

What Federal and State Requirements Must Be Met?

Federal statutes require adherence to eight planning objectives in the development of regional transportation plans:

- support economic vitality of the region;
- increase the safety of the system;
- increase the security of the system;
- increase accessibility and mobility options for people and freight;
- protect and enhance the environment and quality of life;
- improve integration and connection among modes for people and freight;
- promote efficient system management and operations; and
- emphasize preservation of the existing system.

All of these federal objectives coincide with the adopted goals in the plan, and thus have been considered in defining the policies, strategies and projects for the plan. The MTP/SCS is also consistent with other plans and regulations. Detailed descriptions of the following plans and regulations are found in Appendix G-5:

- The plan is consistent with the transportation plans of adjacent regions, short-range transit plans, air quality plans, airport plans, and plans for intelligent transportation systems (ITS).
- The plan is consistent with the California Transportation Plan, a statewide document with policies that should be followed in all regional transportation plans.
- The plan must conform to the federal Clean Air Act, which requires demonstration that emissions from transportation activities in the plan decline steadily until a 2018 deadline by which federal clean air standards must be reached in the region.
- The plan is consistent with the California Clean Air Act, a state regulation that specifies air quality management strategies that must be adopted.
- The plan is consistent with the California Environmental Quality Act (CEQA), through the development of an environmental impact report (EIR) that documents impacts and mitigation issues for the region.
- The plan is consistent with the Coordinated Human Services Transportation Plan (CHSTP), through coordination with groups identified in Appendix E-4 and CHSTP recommendations consistent with the environmental justice analysis described in Chapter 8.
- The plan includes access to interregional transportation, such as Amtrak stations, freight railyards, airports, and the Port of West Sacramento, but does not include planning for those systems, which are owned and operated by other entities. A discussion of interregional transportation is found in Appendix C-1.

- The plan meets the requirements of Senate Bill 375.
- The plan meets the requirements of the Sacramento-San Joaquin Delta Reform Act of 2009.
- The plan meets the requirements of Title VI, California Government Code Section 11135, and environmental justice orders as described in Chapter 8—Equity.

Chapter 3

Summary of Growth and Land Use Forecast

In each MTP update cycle, SACOG prepares a regional growth forecast and land use pattern to accommodate the estimated increases in population, employment and housing. Under Senate Bill 375 (SB 375), these are required components of the Sustainable Communities Strategy (SCS). The development of the regional growth forecast and the land use component of the MTP/SCS are: prepared using state-of-the art data, analysis, and modeling tools; designed to help the region achieve its goals within the confines of how real estate markets actually function and local governments exercise their land use authority; and executed in a manner that helps achieve local and regional goals while maintaining the flow of transportation funds to the region and meeting other federal and state requirements.

The overarching challenge in preparing the regional growth forecast and the land use component of each MTP/SCS update is to estimate, as realistically as possible, the amount and nature of growth for the next two-plus decades so that a transportation system can be planned and built to serve that growth, while maximizing the positive benefits for the region and its residents and minimizing the negative impacts. SACOG strives to do this with two seemingly contradictory goals in mind: using increasingly sophisticated tools to improve the accuracy of its 25-year projections, while writing a plan that recognizes the fact that open market and policy/regulatory forces inevitably will shape the future in ways that are not possible to completely predict or control.

To meet this challenge, SACOG strives to follow the management and planning path employed by the best private businesses and public agencies, including: examining a wide range of alternative futures; trying to understand the many variables that could influence the future; picking a future to head towards and developing clear strategies for getting there; and constantly monitoring progress and quickly adapting to the inevitable changing circumstances encountered along the way.

For SACOG, the Blueprint scenario planning and visioning effort were the first steps along this path, by examining a wide range of alternative growth and transportation patterns for the region, understanding the variables affecting those choices, and choosing a future and strategies to get there. The MTP, and in this case the MTP/SCS, is another step along that path; and the four-year regular plan update cycles provide the means to constantly monitor progress, learn more about the region's growth dynamics, and make frequent mid-course adjustments.

This chapter discusses the development of the regional growth forecast and its allocation in the region to create the SCS. The chapter is divided into four sections. The first provides an overview of the regional growth forecast for the MTP/SCS planning period (2008 to 2035). The second section provides a summary of the method used to allocate the growth forecast throughout the region (i.e., where the new construction for jobs, houses and people is projected to occur). The third section describes the actual projected land use pattern—residential and employment—in the SCS from three perspectives: Community Type, Blueprint principles, and Transit Priority Areas. The fourth and final section describes the potential application of the SCS after its adoption. The transportation elements of the MTP/SCS are described in full detail in Chapter 4—Summary of Budgets and Investments.

Regional Growth Forecast

The MTP/SCS identifies areas within the region sufficient to house all of the forecasted population of the region, including all economic segments of the population over the course of the MTP/SCS planning period. The population forecast for the MTP/SCS is based on an economic forecast for the region that takes into account several factors, which are described and explained in more detail in Appendix D—Regional Projections, and Appendix E-3—Land Use Forecast Background Documentation.

SACOG typically updates its growth forecast on the four-year MTP update cycle. The Center for Continuing Study of the California Economy (CCSCE) develops the growth projections for SACOG, including projections of future employment (by major employment sector), population and household growth at the regional scale. The CCSCE's regional growth projection method follows three major steps: (1) employment projections based on projections of U.S. and California job growth and the competitive position of the Sacramento region to capture a share of the state and national job growth; (2) population projections based on projected job growth, accounting for foreign immigration and domestic migration into the region; and (3) household projections based on projected population growth. This draft information is summarized and reviewed by the SACOG board and staff, member cities and counties, and stakeholders, and is ultimately approved by the SACOG board. Once the projections are approved by the SACOG board, they become the growth forecast that is utilized for planning purposes in the MTP/SCS. Appendix D provides a more detailed description of the regional growth projections methodology. SACOG also reconciles these projections for the region, including additional travel-generating populations, such as students.

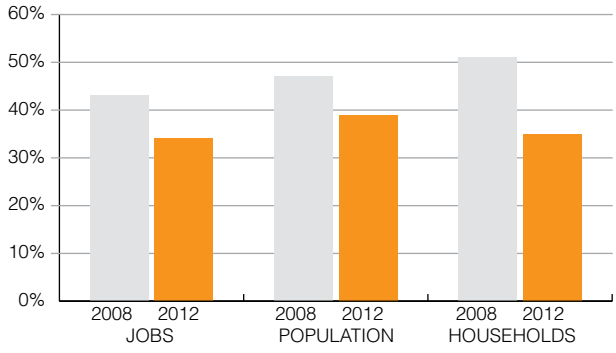
The 2035 growth forecast indicates that population in the plan area is expected to grow by 871,000 people, an increase of about 39 percent, between 2008 and 2035. As shown in Figure 3.1 below, this forecast is lower than the 1.3 million people forecasted in the 2008 MTP, which

had the same 2035 planning horizon, but used 2005 as the base year. As a result of the lower population forecast, the housing and employment forecast for the region is also lower than the forecast in the previous plan, resulting in the need to accommodate approximately 361,000 new employees and 303,000 new housing units between 2008 and 2035.

A decline in domestic in-migration is the principal cause of the declining population projections, although the recent recession also contributes to declining population growth in the early years. The U.S. economy is projected to grow at a slower rate, California is projected to get a smaller share of U.S. job and population growth, and the region's economy is expected to recover at a slower rate than some other areas of the state, with state budget deficits restraining job growth in the public sector over the next decade. The SACOG region is still expected to outpace the state and nation in job growth in the latter part of the planning period; however, the region is expected to have a smaller job growth advantage than was anticipated in the 2008 MTP. Appendix D has more detail on the differences between this current set of projections and the projections used in the 2008 MTP.

Although the growth forecast through 2035 that underpins this plan is somewhat lower than the 2035 growth forecast in the prior plan, it projects a healthy future growth rate for the region over the mid and long terms. Of course, the growth forecast is not all science.

Figure 3.1
SACOG Region Growth Rates



Source: SACOG, 2011.

While the MTP/SCS is centered on a planning period of 2008-2035, a number of planning processes also rely on phasing assumptions for the year 2020. SB 375 requires the SCS to demonstrate that it can achieve a target reduction in passenger vehicle greenhouse gas (GHG) emissions by the years 2020 and 2035, if feasible to do so. The year 2020 is very close to the 2018 attainment demonstration year for the Ozone State Implementation Plan (SIP), a state-administered air quality plan that shows how the SACOG region will meet National Ambient Air Quality Standards for this pollutant.[1] The year 2020 is also very close to the 2021 horizon year of the next Regional Housing Needs Allocation (RHNA), an eight-year housing allocation that SACOG is required to develop under state housing law. (Appendix E-5 provides more information on SACOG's role in this housing process.) SB 375 also requires that the RHNA be consistent with the growth pattern of the SCS and that the SCS identify areas within the region sufficient to house an eight-year projection of the region's housing need.

For these reasons, SACOG worked closely with the California Departments of Finance and Housing and Community Development to identify the most accurate population, housing and employment projections for 2020. The same economic and demographic factors used to develop the 2035 regional growth forecast are used to develop the 2020 growth forecast. Given the near-term time frame of 2020, and the expectation of some recovery from the 2008 economic recession before then, a number of other variables were scrutinized during this process, including vacancy rates, growth rates, household formation behavior, and the health of the home-building industry. Thus, the 2020 forecast represents an interim snapshot of the MTP/SCS growth forecast. Table 3.1, below, shows the regional growth forecast for the MTP/SCS.

Table 3.1
MTP/SCS Regional Growth Forecast

Year	Employees	Population	Housing Units
2008	966,316	2,215,044	884,725
2020	1,068,839	2,519,947	1,003,725
2035	1,327,424	3,086,213	1,187,744

Source: SACOG, 2011.

[1] The SIP also requires that SACOG prepare growth estimates, projected land use patterns, travel behavior and air emissions for what are termed horizon years, which are 2012, 2014, 2017, 2018, 2022, 2025, and 2035. Chapter 7—Environmental Sustainability and Appendix G-5, provide more information on the State Implementation Plan.

Land Use Forecast

The growth forecast is for the region. It is not disaggregated to political jurisdictions or any other geographic subarea. However, SACOG must allocate the growth forecast to project the land use pattern that is most likely to occur over the planning horizon of the plan.

The growth forecast, and the process for allocating it within the region, are affected by federal and state requirements related to regional transportation plans and the Clean Air Act. (See Cal. Gov. Code, § 65080; 23 U.S.C. § 134; 42 U.S.C. § 7506; 23 C.F.R. pt. 450; 40 C.F.R. pt. 93). In general, these laws and regulations require SACOG to develop a forecasted land use pattern, based upon the best available information, in order to, among other things, design specific transportation improvements to serve that land use, and to perform travel modeling to determine the performance of the transportation system and determine whether the plan, including its land use and transportation components, meets federal air quality conformity requirements.[2] Starting with the current planning cycle, this process is also affected by SB 375, and specifically its requirements to include an SCS, to calculate the greenhouse gas emissions resulting from passenger vehicles, and enable the CEQA streamlining benefits for projects that are consistent with the SCS.

Additionally, the newly adopted Sacramento-San Joaquin Delta Reform Act of 2009 (Delta Reform Act), Senate Bill X7 1 (Stats 2009, 7th Ex. Sess., Ch. 5), provides an exemption from the Delta Reform Act's provisions for projects within the secondary zone of the Delta that are consistent with the SCS. More information on the Delta Reform Act and how it relates to the MTP/SCS is at the end of this chapter in the "Application of the SCS" section.

Following the federal and state regulations above, SACOG prepared an estimated 2035 growth pattern for the region, which is the land use forecast. This land use forecast is the result of two processes: a public engagement process that included board direction following a series of public workshops, and a more technical process that included consideration of market analysis and policy/regulatory factors. As discussed below, the amount of input and the number of variables in each of these processes is immense.

Both Chapter 2—The Planning Process and Appendix G-1 provide detailed information on the alternative scenarios analyzed, the input gathered during a series of public workshops held in October 2010, and the subsequent framework for creating the MTP/SCS adopted by the SACOG board in December 2010. Some of the most important parts of the framework to come out of the scenario process were the preliminary targets for the types of housing to construct regionally (i.e., percent of new homes that should be rural residential, large-lot single family, small-lot single family, and attached), the percent of the new growth to target in the various Community Types (i.e., Center and Corridor Communities, Established Communities, Developing Communities, and Rural Residential Communities), the share of new growth near high-quality transit, and the primary areas of the region to focus on to improve jobs-housing balance.

It is important to understand that the purpose of these preliminary targets is to provide a starting place to conduct the extensive task of building a regional land use projection through 2035. They are not necessarily the ending point, as many factors are considered during the iterative process of building the final plan.

The first step in the transition from the growth forecast to a land use forecast is to convert projected amounts of future employees and households into projected new development to serve employment for different segments of the economy (i.e., retail, office, industrial, etc.) and new housing units. For households, this process includes establishing an estimated "vacancy factor" for existing and future residential buildings. The plan assumes a 5 percent vacancy factor for residential growth.

After creating, evaluating, and seeking broad-based input on a range of alternative future scenarios, and receiving direction from the SACOG board, the land use component of the MTP/SCS is built by examining a wide range of factors in two basic areas: market forces and policy/regulatory influences. The location, nature and pace of growth are the confluence of market forces and public policies. They shape each other. Neither happens in isolation. As explained throughout this document, the land use component of the plan is influenced by the planning principles of many public policies, but this occurs within the context of the best available information regarding current and future market demand, economics and development trends.

As it develops the estimated MTP/SCS land use forecast, SACOG consults with local governments and stakeholders as it considers a number of factors throughout this process. The SACOG Planners Committee[3] was the primary venue for ongoing coordination between local agency planning staff and SACOG; however, a number of jurisdiction-specific meetings and comment periods were also held. In December 2009, at the launch of the MTP/SCS update, SACOG staff met with each jurisdiction individually to dis-

[2] See Appendix G-5 for a summary of the relevant federal and state laws and a description of how federal Clean Air Act and SB 375 emissions requirements shape some of the technical aspects of preparing and documenting the MTP/SCS.

[3] The SACOG Planners Committee is a 28-member committee consisting of the planning directors, or their designees, of each of SACOG's member jurisdictions. The committee was originally formed to advise SACOG on the development of the Blueprint Project and is now advising on all land use and housing related items. This committee meets monthly (or as needed) and received updates regarding the MTP/SCS update throughout the process.

cuss the update process and to collect new and/or updated planning assumptions. Staff also discussed the upcoming planning process, and worked to keep staff informed of key dates, milestones, and comment periods in the planning process. Throughout the process of developing the land use forecast (from May 2010 to August 2011), SACOG had five review and comment periods that were directed specifically to local agency planning staff for comments on the land use assumptions in their jurisdiction. Chapter 2—The Planning Process, Appendix G-1, and Appendix E-3 provide more information on the public process, the development of the workshop scenarios and a Draft Preferred Scenario, as well as the interaction between SACOG and local agency planning staff.

While many factors are considered, there is not a single mathematical formula or computer program used to create the land use forecast. The analytical process is iterative. Multiple variables are evaluated, and as the picture gets clearer and more focused, many of these factors are rechecked, adjusted, rechecked, and adjusted again until a forecast is created that can credibly be described as the best estimate of how the region's land use pattern is expected to evolve through 2035. Soon after the plan is adopted, the next plan update cycle begins, following the same process. Actual development activity is tracked and documented, data sources are refreshed, and new and better analytical tools are constructed, as the region collectively works to continually improve at understanding all of the complex dynamics that influence growth patterns and how to maximize the positive, and minimize the negative, consequences of growth.

Most of the market and policy/regulatory variables considered in the MTP/SCS land use forecast process can broadly be categorized as either predominantly supply or demand influences. Many of the most important variables are summarized below. A more detailed explanation is included in Appendix E-3.

Theoretical Supply Analysis

The foundation of the entire process is adopted local government general plans, community plans, specific plans and other local policies and regulations. SACOG is required to consider adopted local land use plans in the formulation of the land use forecast. Most of the other variables that are considered serve to help refine the sum of the local plans in order to create the most likely future development pattern. In order to consider these plans most effectively, SACOG creates a set of "build out," or capacity, assumptions for the region. This includes creating an inventory of unbuilt capacity for housing and employment within existing adopted plans. In addition to these plans, the housing and employment capacity within projects that are actively under development, or are currently in or about to begin the entitlement process, are also inventoried if the project is forecasted for some development in the MTP/SCS.

Practical Considerations that Modify the Theoretical Supply Analysis

A number of variables are considered that help to estimate the timing of growth within the plan capacities, and sometimes serve to modify the estimated upper-end growth amounts expected from the plans. Major variables considered include:

- Availability of existing infrastructure and economic feasibility of providing needed additional infrastructure (e.g., transportation, water, sanitary and storm sewer).
- Floodplain issues, including the timing and likelihood of successfully providing needed flood protection infrastructure.
- Natural resources issues, especially whether federal permits under the Clean Water Act and/or the Endangered Species Act are required and, if so, the expected timing of securing these permits.
- Feasibility and timing of securing any needed permits to address brownfield (i.e., toxic substances) issues.
- Likely timing of securing any needed additional local approvals (e.g., land use entitlement, annexation approval, sphere of influence approval)

Some of these considerations serve to reduce the estimated capacities in the local plans, but mainly this analysis affects the estimated timing of the construction of the plans.

Demand Analysis

SACOG's demand analysis includes examining both historical data and estimates of future trends.

- Historical data include the current conditions (2008 base year) for the regional market share of jobs and housing, as well as trend data for the regional market share of housing and employment growth.
- Future demand data include variables such as:
  - Market demand studies for the types and locations of housing future residents are likely to prefer;
  - Federal, state, local policy and/or regulatory trends that may affect the choices available to consumers; and
  - Trends in economic incentives (e.g., availability of transportation funds, redevelopment financing, mortgage practices, and restriction or expansion of other financial instruments to raise funds for infrastructure and public services).

The combined data and information on projected supply and demand are then compared to determine consistencies and inconsistencies. Some adopted local plans have substantially more capacity than will build out by 2035. Retail capacity is an example in many jurisdictions; housing capacity is an example in some. In these cases, SACOG must estimate how much of the available capacity will be built by 2035, leaving some room for vacancy factor(s) and the

practical considerations (above) that naturally limit development. When there is more projected demand than existing plan capacity, SACOG must estimate how many plans that are still in the entitlement process are likely to be fully approved and start construction by 2035. And sometimes, local jurisdictions will amend and re-entitle existing plans to respond to changing market demand.

After creating and vetting the 2035 land use pattern and assumptions with local agency planners, stakeholders, and the SACOG board, SACOG staff then repeats the process above to estimate a land use pattern that matches the regional growth forecast for 2020.

As noted above, SACOG builds the land use component of the MTP/SCS on the foundation of the 28 city and county general plans of its member jurisdictions, and their other local plans, regulations and policies. However, SACOG's MTP/SCS growth forecast can never be just the sum of its 28 member local governments' adopted general plans at any given point in time. The MTP/SCS and local general plans are two related, but different, kinds of planning documents. General plans are by nature aspirational, have widely ranging timeframes and are not comprehensively updated very frequently. The MTP/SCS must be a fiscally and time-constrained plan, with a forecasted growth pattern that is consistent with—i.e., not exceeding—the amount of forecasted population, employment, and housing growth for the region by 2035. For example, if a city has a general plan with a 50-year planning horizon, the MTP/SCS growth forecast may indicate growth on only a portion of the land designated in the city's general plan for future growth. The reverse may also be true. The MTP/SCS growth forecast may show growth in areas that are not yet formally included in a county's or city's general plan if SACOG estimates that there is market demand for growth in that location, and that the entitlement process can realistically be expected to be successfully completed and construction begun during the planning period.

Including growth within the MTP/SCS is not a guarantee that it will happen. Likewise, growth in areas outside the MTP/SCS may, indeed will, occur during the planning period. Growth outside the MTP/SCS may or may not be consistent with the smart growth, long-term, Blueprint vision for the region. In any event, however, SACOG has no authority to require or prohibit growth of any kind. While local agencies may take advantage of certain CEQA benefits and other incentives, CEQA does not mandate that local agencies use the MTP/SCS to regulate GHG emissions or for any other purpose. Senate Bill 375 also specifically states that a sustainable communities strategy does not regulate land use, that city and county land use policies and plans are not required to be consistent with the MTP/SCS, and that nothing in a sustainable communities strategy "shall be interpreted as superseding the exercise of the local land use authority of cities and counties within the region." (Gov. Code, § 65080(b)(2)(J)). The MTP/SCS does not regulate local land use authority or preclude a local jurisdiction from planning and approving growth that is different in terms of total units or geographic extent.

It is also important to remember that the MTP/SCS is updated on a federally-regulated cycle of at least every four years. This means that if new information about individual development projects, for instance, becomes available after an MTP/SCS is adopted, SACOG is obligated to address that information in the next MTP/SCS update cycle. Importantly, the next update (to be adopted no later than April 2016) will include adding at least four additional years to the forecast. Barring further major economic challenges, that forecast will most likely project the need for more residential and non-residential construction than is included in the current plan and, therefore, it is likely to include more land for development than in the current plan. SACOG will begin preparing the updated growth forecast for the next plan in 2014.

Voluntary land use decisions by cities and counties will be critical to the success of this MTP/SCS. Over time, the region has increasingly committed to integrating regional transportation plans and local land use plans so that they reinforce each other in order to minimize regulatory constraints and maximize the opportunities for a steady flow of transportation funds to the region. SB 375, with its requirement to include an SCS in the MTP, further supports collaboration between local and regional planning efforts.

Details of the MTP/SCS Forecasted Land Use Pattern

To accommodate a projected increase of approximately 871,000 people, 303,000 new housing units and 361,000 new employees in the region through the year 2035, the MTP/SCS projects the development of an additional 53,266 acres of land. Importantly, the plan accommodates a nearly 40 percent increase in population in the region on only a 7 percent increase in the development footprint of the region from 2008 to 2035, or less than 2 percent of the entire acreage of the Sacramento region. The following describes the MTP/SCS land use pattern in three ways: by Community Type, by Blueprint principle, and by Transit Priority Areas. These discussions will reference the 2008 base year (or existing conditions) and the 2020 and 2035 MTP/SCS land use forecast.

Community Types Framework

SACOG has created a framework for describing the MTP/SCS that is made up of Community Types. Local land use plans (e.g., adopted and proposed general plans, specific plans, master plans, corridor plans, etc.) were divided into one of five Community Types based on the location of the plans. They will be used throughout this chapter to describe the MTP/SCS land use pattern. Figure 3.2 illustrates these Community Types, which are also briefly defined as follows:

Center and Corridor Communities

Land uses in Center and Corridor Communities are typically higher density and more mixed than surrounding land uses. Centers and Corridors are identified in local plans as historic downtowns, main streets, commercial corridors, rail station areas, central business districts, town centers, or other high density destinations. They typically have more compact development patterns, a greater mix of uses, and a wider variety of transportation infrastructure compared to the rest of the region. Some have frequent transit service, either bus or rail, and all have pedestrian and bicycling infrastructure that is more supportive of walking and bicycling than other Community Types.

Established Communities

Established Communities are typically the areas adjacent to, or surrounding, Center and Corridor Communities. Local land use plans aim to maintain the existing character and land use pattern in these areas. Land uses in Established Communities are typically made up of existing low- to medium-density residential neighborhoods, office and industrial parks, or commercial strip centers. Depending on the density of existing land uses, some Established Communities have bus service; others may have commuter bus service or very little service. The majority of the region's roads are in Established Communities in 2008 and in 2035.

Developing Communities

Developing Communities are typically, though not always, situated on vacant land at the edge of existing urban or suburban development; they are the next increment of urban expansion. Developing Communities are identified in local plans as special plan areas, specific plans, or master plans and may be residential-only, employment-only, or a mix of residential and employment uses. Transportation options in Developing Communities often depend, to a great extent, on the timing of development. Bus service, for example, may be infrequent or unavailable today, but may be available every 30 minutes or less once a community builds out. Walking and bicycling environments vary widely, though many Developing Communities are designed with dedicated pedestrian and bicycle trails.

Rural Residential Communities

Rural Residential Communities are typically located outside of urbanized areas and designated in local land use plans for rural residential development. Rural Residential Communities are predominantly residential with some small-scale hobby or commercial farming. Travel occurs almost exclusively by automobile and transit service is minimal or nonexistent.

Lands Not Identified for Development in the MTP/SCS Planning Period

These areas of the region are not expected to develop to urban levels during the MTP/SCS planning period. Today, these areas are dominated by commercial agriculture, forestry, resource conservation, mining, flood protection, or a combination of these uses. Some of these areas have long-term plans and policies to preserve or maintain the existing "non-urban" uses; however, some are covered under adopted or proposed plans that allow urban development and/or are included in the adopted Blueprint vision for future growth. When it was adopted by the SACOG board in 2004, the regional Blueprint was projected to meet growth needs through 2050. Under today's slower regional growth rate projections, there is likely capacity in the Blueprint beyond 2050. As noted above, this MTP/SCS cannot predict market and regulatory conditions with certainty and it is possible, if not likely, that some housing and employment growth may occur in these areas that is nevertheless consistent with the Blueprint.

Though the MTP/SCS does not assume any development in these areas by 2035, it is likely that some housing and employment growth associated with agriculture, forestry, mining, and other rural uses will occur in these areas within that timeframe. This is particularly true in the areas that have long-term plans and policies to sustain the current rural uses. It is especially difficult to estimate where this growth will go on a parcel basis because employment in these areas is often seasonal and is dispersed over a large geography, and because residential uses are often a secondary or an accessory use to agriculture and/or the other rural uses listed above.

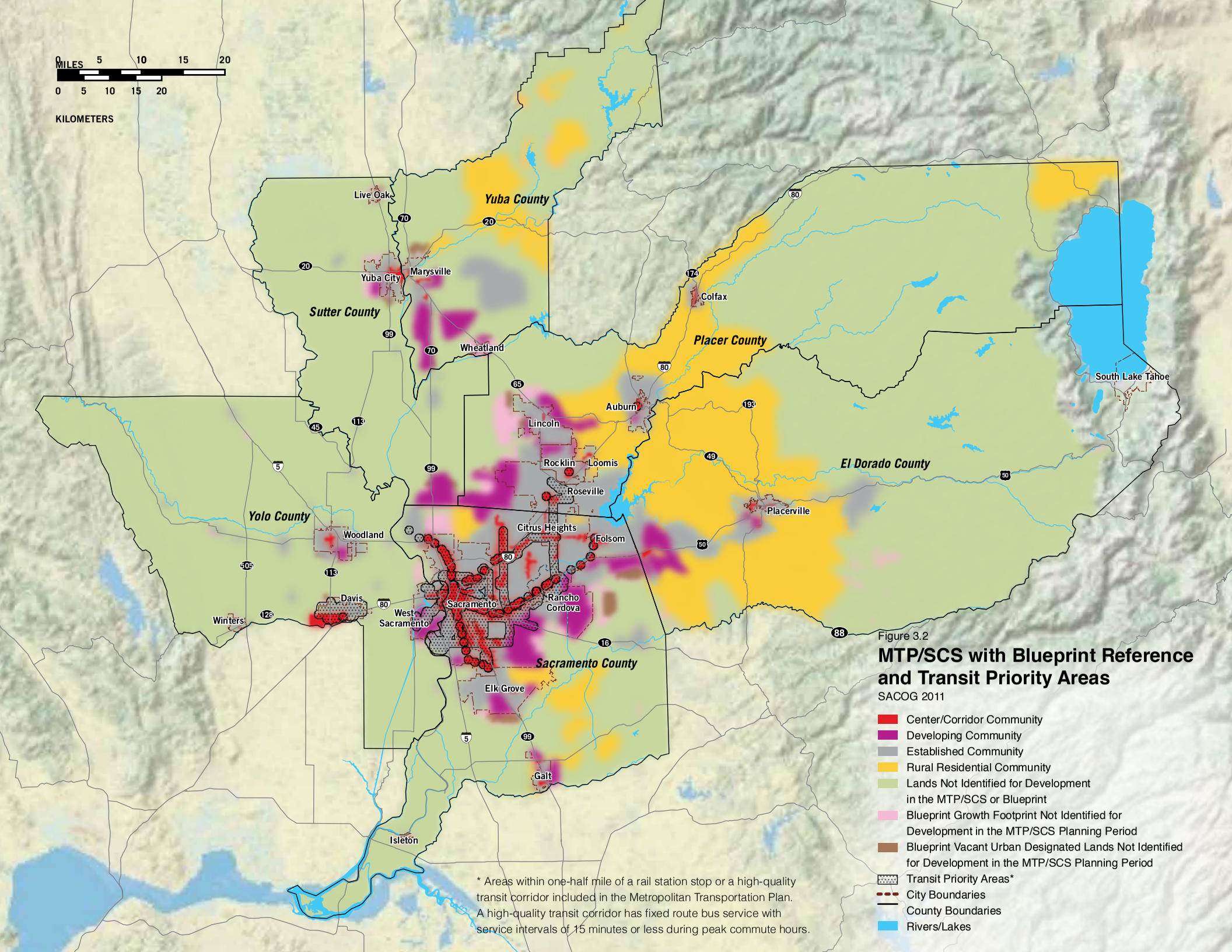


Figure 3.2

MTP/SCS with Blueprint Reference and Transit Priority Areas

SACOG 2011

- Center/Corridor Community
- Developing Community
- Established Community
- Rural Residential Community
- Lands Not Identified for Development in the MTP/SCS or Blueprint
- Blueprint Growth Footprint Not Identified for Development in the MTP/SCS Planning Period
- Blueprint Vacant Urban Designated Lands Not Identified for Development in the MTP/SCS Planning Period
- Transit Priority Areas*
- City Boundaries
- County Boundaries
- Rivers/Lakes

MTP/SCS Land Use Distribution by Community Type
A summary discussion of the approach taken to growth allocations for each Community Type follows. In each case, the forecast largely relies on growth that is generally consistent with the location, density and intensity of use (Gov. Code, § 65080(b)(2)(B)) in existing general plans or other local adopted plans, but does not utilize all available capacity in those plans by 2035. Tables 3.2 and 3.3 show the housing and employment by sector projected in the MTP/SCS. The Community Type map in Figure 3.2 is included in this plan to depict the general areas projected for growth.

Table 3.2
Summary of Housing Units Forecasted in MTP/SCS

Community Type	2008 Existing Housing Units	Total 2035 MTP/SCS Forecasted Housing Units
Center and Corridor Communities	103,209	195,255
Established Communities	684,129	763,491
Developing Communities	25,717	152,027
Rural Residential Communities	71,670	76,971
Region Total	**884,725**	**1,187,744**

Source: SACOG, September 2011

Table 3.3
Summary of Employment Forecasted in MTP/SCS

Community Type	Center and Corridor	Established	Developing	Rural Residential	Region Total
2008 Retail Employees	89,799	134,552	4,443	8,673	237,467
2035 Retail Employees	**114,953**	**169,546**	**31,054**	**10,088**	**325,641**
2008 Office Employees	211,195	274,973	4,934	9,964	501,066
2035 Office Employees	**283,231**	**373,100**	**28,952**	**10,815**	**696,098**
2008 Industrial Employees	20,604	89,037	4,079	5,581	119,301
2035 Industrial Employees	**20,305**	**114,243**	**9,436**	**6,451**	**150,435**
2008 Public Employees	34,212	66,184	3,091	5,007	108,494
2035 Public Employees	**41,066**	**95,405**	**12,842**	**5,926**	**155,239**

Source: SACOG, September 2011

Center and Corridor Communities

In 2008, these areas have higher concentrations of employment, usually commercial and office, than other Community Types. Most Centers and Corridors will add new development on vacant or underutilized land, or through redevelopment of existing developed land. As in past MTP land use elements, the land use allocation for this first MTP/SCS assumes that relatively small amounts of excess employment lands will be redesignated by local governments to other purposes, such as mixed use or residential. These trends are more prevalent in urban areas in some other regions of the country than they are yet in the SACOG region. Consistent with this data, the plan forecasts some economic activity converting employment plan designations to residential or mixed use, or redevelopment of existing employment buildings to residential or mixed use. As in past plans, however, some targeted amounts of this type of redevelopment are forecast. SACOG will continue to track these development trends carefully. By 2035, some urban and suburban centers and corridors are projected to add medium- and high-density housing and employment.

The MTP/SCS projects that the total share of housing in Centers and Corridors will increase from 11 percent in 2008 to 16 percent in 2035, primarily on vacant or underutilized land in close proximity to services and employment opportunities. By 2035, the MTP/SCS land use forecast projects that 30 percent of new housing and 29 percent of new employees will be located in Center and Corridor Communities. Real estate research forecasts that there will be significant demand, especially by the large, retirement age baby boomer generation and the even larger Generation Y echo-boomer cohort (those born between 1978 and 1994), for new housing, including rentals and small-lot homes, in mixed-use communities close to public transit, employment, services and amenities. Many of the local governments in the region have updated, or are in the process of updating, their land use plans to accommodate growth of this type. The MTP/SCS development pattern takes advantage of existing transportation infrastructure (light rail and bus service where present), and creates more types of housing products for the projected population in central locations in close proximity to services and employment opportunities.

The growth in Centers and Corridors, however, is much greater in the second half than the first half of the plan. The projected 2,307 average annual dwelling units between 2008 and 2020 is only about half of the 4,598 average annual dwelling units between 2021 and 2035. Housing growth projections through 2020 represent 39 percent of total projected housing growth through 2035 region-wide, but are only 30 percent of projected housing growth through 2035 in Centers and Corridors. The slower growth rate in the early years of the plan reflects the current market conditions, as well as the time it takes to realize the changes resulting from the market influences and policy changes noted above and to more widely overcome some of the barriers discussed below.

Barriers to growth in the Centers and Corridors include limited public and private sector financing, especially in the short term given current lending practices and the uncertainty surrounding redevelopment caused by the most recent state legislation and pending litigation. In some cases, existing infrastructure capacity is not sufficient, and financing improvements can be challenging due to the multiple owners typically found in finer-grained urban lot patterns. Remediating contaminated soils and groundwater is another barrier on some of these lands.

There are examples throughout the region of development opportunities in Centers and Corridors that are on hold because of conditions such as those described above. However, there are also examples of developments that are proceeding because they have overcome the challenges even in these difficult times, including the downtown and Curtis Park railyards in Sacramento and the Bridge District in West Sacramento. About half of the projected growth in Centers and Corridors in the region is in these two centrally located cities.

Figure 3.3 summarizes the existing conditions, and 2020 and 2035 MTP/SCS projections, for Center and Corridor Communities.

Table 3.4

Summary of Housing Units and Employees in Center and Corridor Communities

Existing Conditions 2008	MTP/SCS 2020 Draft Preferred Scenario	MTP/SCS 2035 Draft Preferred Scenario, 2008–2035
Total Employees	Employee Growth	Employee Growth
355,829	**26,082**	**104,185**
Total Housing Units	Housing Unit Growth	Housing Unit Growth
103,209	**27,678**	**92,046**

Source: SACOG, September 2011

Established Communities

In 2008, Established Communities are generally considered built out, meaning relatively little vacant land is available for new growth. Local land use plans largely seek to maintain the existing character and land use pattern in these areas. For this reason, the MTP/SCS land use forecast projects only an 11 percent increase in housing in this community type, which will primarily occur through the build-out of existing subdivisions and empty infill lots. This will reduce the total share of housing in Established Communities from 77 percent in 2008 to 64 percent by 2035. This growth represents about 3,000 new units per year. The early part of the plan, through 2020, has a slightly higher growth rate, as it assumes many of the newer subdivisions that started building in the last ten years (e.g., most of North Natomas, most of Lincoln, and most of southeast Folsom) will likely continue to build at a more steady pace than traditional infill.

The MTP/SCS projects a 33 percent increase in job growth in Established Communities, which will provide more employment opportunities for residents in this Community Type. Established Communities include many office and industrial parks in the region's secondary jobs centers, including McClellan Park, Sunset Industrial Park, Woodland Industrial Park, and El Dorado Business Park that are projected to see significant continued growth through 2035.

In general, the MTP/SCS projects smaller changes to residential communities in Established Communities than in other Community Types. Selective infill development, consistent with existing planning designations, is projected to occur gradually. Much more change is forecast for the Centers and Corridors and Developing Communities than in the Established Communities.

Development in Established Communities provides opportunities for residents, including completing subdivisions that stalled in the housing downturn, revitalizing commercial centers, adding housing choices, developing more complete streets that balance the transportation needs of auto and non-auto travelers, eliminating blighted vacant lots, and enhancing neighborhood amenities. However, development challenges exist in these areas as well.

Residential and commercial financing and financial feasibility is currently a challenge everywhere, including Established Communities. Older auto-oriented shopping and strip centers may be in decline, but market economics may not yet be ripe for reuse projects, reducing the ability to attract investors to take advantage of infill opportunities even on vacant lots. Additionally, many neighborhoods have arterials and local streets that experience significant traffic and congestion, need maintenance and rehabilitation, and lack attractive transit, pedestrian and bicycle facilities.

Figure 3.4 summarizes the existing conditions and 2020 and 2035 MTP/SCS projections for Established Communities.

Table 3.5

Summary of Housing Units and Employees in Established Communities

Existing Conditions 2008	MTP/SCS 2020 Draft Preferred Scenario	MTP/SCS 2035 Draft Preferred Scenario, 2008–2035
Total Employees	Employee Growth	Employee Growth
561,156	**58,521**	**187,546**
Total Housing Units	Housing Unit Growth	Housing Unit Growth
684,129	**38,169**	**79,362**

Source: SACOG, September 2011

Developing Communities

Developing Communities are typically the areas slated for the next increment of urban expansion at the edge of existing urban or suburban development and therefore are generally situated directly adjacent to Established Communities. They are usually identified in local plans as specific plans, special plan areas, or master plans. These communities may be residential-only, employment-only, or a mix of typically low- to medium-density residential with employment and supporting commercial and public uses. A smaller number of Developing Communities that are mixed in residential and employment uses have large, regional employment centers planned. Similarly, a small number of Developing Communities are planned as large employment-only areas.

In 2008, some of these areas are partially developed while others that are not yet approved or under development are used for farming, grazing, natural resource extraction, or other non-urban uses. By 2035, Developing Communities will be fully or partially constructed.

The MTP/SCS projects that 42 percent of the forecasted housing demand and 18 percent of the employment demand will be in Developing Communities. This will bring the share of housing in Developing Communities up from 3 percent in 2008 to 13 percent of the total regional housing pool in 2035. Employment in Developing Communities experiences a smaller gain in the regional share of employees as it goes from 2 percent in 2008 to 6 percent of the total employees in the region by 2035. Unlike Established Communities, which experience high employment growth relative to housing growth, Developing Communities experience high housing growth relative to employment growth. This is due to two factors: (1) most of the residential growth in Developing Communities is not expected to fully build out by the horizon year of the MTP/SCS and, therefore, a critical mass of housing is not present to support planned employment growth; and (2) most Developing Communities are located around existing regional job centers in south-

west Placer County, southeastern Sacramento County, and urbanized Yolo County and are intended to provide nearby housing for those job centers.

The Developing Communities included in the MTP/SCS generally are quite different from the large-scale master planned communities typical of the last few decades. Consistent with Blueprint principles, many of them provide a wider range of housing choices, are often located adjacent to existing large job centers whose workers will benefit from nearby housing options, provide a local resident-serving mix of uses such as schools, parks, and retail, and typically have a pedestrian and bicycle network and at least options reserved for future transit.

Developing Communities also face their share of challenges, including how much overall demand there will be in this Community Type. Perhaps the largest question is just how much market demand there will be for the portion of housing that is more traditional, larger-lot single family stock. In the near term, a 9 percent residential vacancy rate and large numbers of foreclosures provides significant competition for whatever demand there is for these traditional products. High infrastructure and service costs for roads, transit, water, sewer, drainage and schools, as well as costs for police, fire and other services, are a significant barrier to starting large-scale developments. Local government financial conditions create understandable pressures to set development fees at levels that cover the government's total upfront and ongoing costs, sometimes affecting the profitability and economic viability of the projects. This can be particularly challenging for the smart growth products in the lower price ranges, e.g., small-lot single family, row houses and townhomes. Additionally, the outcome of new flood mapping currently being conducted by FEMA in Yolo and Sutter counties could affect development in the early years of this plan within these two counties in particular.

There are significant issues related to the federal Endangered Species and Clean Water Acts, administered by the U.S. Fish and Wildlife Service and U.S. Army of Corps of Engineers, especially in and around the two largest suburban employment centers of the region in southwest Placer County and southeastern Sacramento County along the U.S. 50 corridor. Substantial, multi-year efforts to develop Habitat Conservation Plans (HCPs) in these two areas designed to resolve the environmental protection and development pressure trade-off issues are ongoing, but not yet successfully completed. Some of the most valuable vernal pools/wetlands and grassland resources in the region are in these two areas. More information on HCPs and the natural resources considered in the MTP/SCS is in Chapter 7—Environmental Sustainability.

Figure 3.5 summarizes the existing conditions and 2020 and 2035 MTP/SCS projections for Developing Communities.

Table 3.6
Summary of Housing Units and Employees in Developing Communities

Existing Conditions 2008	MTP/SCS 2020 Draft Preferred Scenario	MTP/SCS 2035 Draft Preferred Scenario, 2008–2035
Total Employees	Employee Growth	Employee Growth
16,514	**17,421**	**65,323**
Total Housing Units	Housing Unit Growth	Housing Unit Growth
25,717	**51,035**	**126,310**

Source: SACOG, September 2011

Rural Residential Communities

The majority of growth in Rural Residential Communities is located in the foothills of El Dorado, Placer and Yuba counties. Rural residential designations are intended primarily for residential use, but also allow for limited agricultural use where ample water supply and suitable soils are available. Examples of these small-scale agricultural areas include Apple Hill in El Dorado County and Newcastle in Placer County.

The unincorporated portions of El Dorado, Placer, Sacramento, and Yuba counties that are covered by the Rural Residential Community Type, generally allow a maximum density of one home per acre. Development in these areas occurs on a small scale, typically through individual lot development. Because of this, the residential capacity in these areas is very high and likely more than the region will ever need to meet the demand. The MTP/SCS estimates that 2 percent of the projected housing demand, and 1 percent of employment demand, will be met in Rural Residential Communities. Due to the rural and residential focus of Rural Residential Communities, employment growth is minimal. Because of the limited growth assumed, the share of the region's total housing forecasted in 2035 would actually decrease from 8 percent to 7 percent.

Although the growth in these communities is limited, they are important as they offer housing choice and, in some cases, can support the continuation of small agricultural and resource-based businesses.

However, many of these communities face challenges, whether from limited or expanded growth. Because of limited nearby jobs, health care, retail and other services, residents in these communities often must travel farther to shopping, professional services, and employment, thereby increasing vehicle travel and the congestion and air quality impacts that accompany it. Providing emergency and other public services to these areas also is a challenge due to

their generally remote locations. Infrastructure costs, particularly wastewater treatment and water, in these areas can be significant for the local agency and the land owner.

Figure 3.6 summarizes the existing conditions and 2020 and 2035 MTP/SCS projections for Rural Residential Communities.

Table 3.7
Summary of Housing Units and Employees in Rural Residential Communities

Existing Conditions 2008	MTP/SCS 2020 Draft Preferred Scenario	MTP/SCS 2035 Draft Preferred Scenario, 2008–2035
Total Employees	Employee Growth	Employee Growth
32,817	**499**	**4,054**
Total Housing Units	Housing Unit Growth	Housing Unit Growth
71,670	**2,118**	**5,301**

Source: SACOG, September 2011

Blueprint Framework

A survey of local planning efforts shows that since 2005, the 28 cities and counties of the SACOG region have been working voluntarily to incorporate the Blueprint principles into their local plans and policies. These efforts are reflected in the SCS land use forecast: the distribution of new development acres through 2035 reflects an urban and suburban-focused development pattern that is far different from the "base case" development pattern that was originally projected for the region before the Blueprint project. Information collected from local governments over two MTP cycles on general plans, specific plans, ordinances and other plans and regulations, demonstrates that cities and counties are including Blueprint principles in their plans and policies; this information is documented in Appendix E-3. Recent housing market studies support the original Blueprint vision of more diverse housing choice.[4] The public workshops and focus groups informing this MTP/SCS show public demand for a Blueprint growth pattern and transportation system.

The MTP/SCS is aligned in purpose with the Sacramento region's smart land use Blueprint vision. The land use forecast of the MTP/SCS reflects the extent of implementation of the Blueprint principles by local jurisdictions. More information on the Blueprint is in Chapter 1 and Chapter 2.

MTP/SCS Land Use Distribution by Blueprint Principles

The following describes the MTP/SCS according to the seven Blueprint principles: Housing Choice and Diversity; Use Existing Assets; Compact Development; Natural Resource Conservation; Design for Quality; Mixed Use Developments; and Provide Transportation Choices.

Housing Choice and Diversity

Providing a variety of housing options, including apartments, condominiums, townhouses, and single-family detached homes on varying lot sizes, creates opportunities for the variety of people who need them: families, singles, seniors, and people living with special needs. Since the beginning of the Blueprint project, SACOG has used four categories to describe housing product mix:

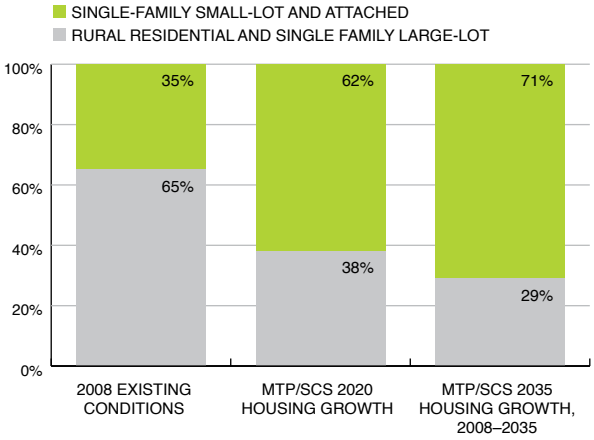
- Rural Residential: Single-family detached homes built at densities less than one dwelling unit per acre.
- Large-Lot Single-Family: Single-family detached homes built at densities between one and 8 dwelling units per acre.
- Small-Lot Single-Family: Single-family detached homes built at densities between 8 and 25 dwelling units per acre.
- Attached: Single-family and multi-family homes ranging from duplexes, triplexes, lofts, apartments, condominiums, townhomes, row houses, half-plexes, etc., built at densities from 8 to over 50 dwelling units per acre.

[4] Brett, 2011

The Blueprint envisioned by 2050 a diverse mix of new housing to accommodate the housing needs and choices of a diverse population: 41 percent of new homes as attached products, 28 percent of new homes as small-lot single family, 30 percent as large-lot single family, and 1 percent of new homes as rural residential housing.

More recent demographic studies indicate that housing choice will become an increasingly important issue in the future as the population is dominated by older adults and more ethnic diversity.[5] Evolving demographics and preferences held by specific demographic groups or generational cohorts are driving the change in housing preference and demand. Additionally, recent research suggests that not only will people want a choice in terms of location and housing product type, but also that a higher percentage of the population will choose to rent, and will rent for longer periods than has occurred historically. As part of the MTP/SCS process, SACOG researched and wrote a white paper on housing demand. Please see Appendix E-6 for the full paper and bibliography. While there is no clear line between housing product type and rental versus ownership, traditionally attached housing units have a higher rental rate than detached housing units. The American Community Survey for 2005–2009 reports that, in the region, approximately 90 percent of owner-occupied units are detached units, while 67 percent of renter-occupied units are attached. Based on the available evidence, the MTP/SCS estimates that there will be growing demand for attached and small-lot single-family housing products over the planning period of the MTP/SCS, along with lower demand for large-lot single-family housing products, which currently make up the large majority of the current housing in the region. As a result of this projected demand and the Blueprint-supportive planning that local agencies have adopted, the MTP/SCS, as shown in Figure 3.7, provides a mix of housing options that focuses on improving the current relative shortages of attached and small-lot products.

Table 3.8
Summary of Housing Product Mix



Source: SACOG, September 2011

[5] Sacramento Area Council of Governments, "Changing Demographics and Demand for Housing Types," January 2011. p. 2-3.

Regionally, 43 percent of the new housing in the MTP/SCS is attached, 28 percent is small-lot single-family, 28 percent large-lot single-family, and 1 percent rural residential. The changing housing product mix is a gradual continuation of current market trends, with higher percentages of attached and small-lot single-family products projected in the 2021 to 2035 time period than in the 2008 to 2020 time period.

By 2035, new housing in Centers and Corridors is predominantly attached, due to higher residential densities proposed or allowed in these areas by local jurisdictions. New housing in Established Communities is balanced between large-lot single-family, small-lot single-family and attached. New housing in Developing Communities is predominantly large-lot single-family and small-lot single-family product. New housing in Rural Residential Communities is almost entirely rural residential and large-lot single-family housing product. These distributions can be seen in summary Tables 3.4 and 3.5.

Table 3.9
Summary of Housing Product Distribution by Community Type for 2020 and 2035 Growth

	Community Type				
	Center and Corridor	**Established**	**Developing**	**Rural Residential**	**Region Total**
2008–2020 Rural Residential	0%	0%	1%	35%	1%
2008–2035 Rural Residential	**0%**	**1%**	**1%**	**38%**	**1%**
2008–2020 Large-Lot Single-Family	4%	40%	52%	64%	37%
2008–2035 Large-Lot Single-Family	**3%**	**30%**	**44%**	**52%**	**28%**
2008–2020 Small-Lot Single-Family	22%	35%	28%	1%	28%
2008–2035 Small-Lot Single-Family	**14%**	**38%**	**33%**	**9%**	**28%**
2008–2020 Attached	74%	25%	19%	0%	34%
2008–2035 Attached	**83%**	**32%**	**22%**	**2%**	**43%**

Source: SACOG, September 2011

Table 3.10
Summary of Housing Product Distribution by Community Type for 2008–2020 and 2021–2035

Community Type	**Center and Corridor**	**Established**	**Developing**	**Rural Residential**	**Region Total**
2008–2020 Rural Residential	0%	0%	1%	35%	1%
2021–2035 Rural Residential	**0%**	**1%**	**1%**	**39%**	**1%**
2008–2020 Large-Lot Single-Family	4%	40%	52%	64%	37%
2021–2035 Large-Lot Single-Family	**2%**	**21%**	**39%**	**45%**	**22%**
2008–2020 Small-Lot Single-Family	22%	35%	28%	1%	28%
2021–2035 Small-Lot Single-Family	**10%**	**40%**	**36%**	**14%**	**28%**
2008–2020 Attached	74%	25%	19%	0%	34%
2021–2035 Attached	**88%**	**38%**	**24%**	**2%**	**49%**

Source: SACOG, September 2011

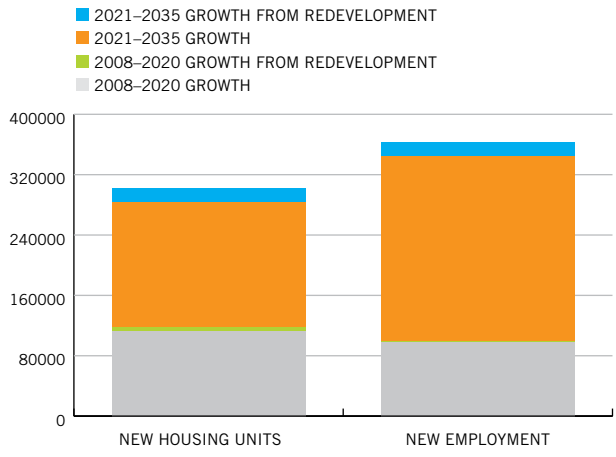
Use Existing Assets

In urbanized areas, development on infill or vacant lands, intensification of the use of underutilized parcels (e.g., more development on the site of a low-density retail strip shopping center), or redevelopment (e.g., re-using existing vacant buildings or lots) often makes better use of existing public infrastructure. Today, 89 percent of the region's housing is located in Center and Corridor Communities and Established Communities. These two Community Type areas are also where 95 percent of the region's jobs are located. The MTP/SCS takes advantage of the infill opportunities in both of these areas: as noted previously, 30 percent of new homes and 29 percent of new jobs will occur in Centers and Corridors; 26 percent of new homes and 52 percent of new jobs will occur in Established Communities.

The MTP/SCS also projects targeted redevelopment in Center and Corridor Communities: of the region's new housing and jobs by 2035, 7 percent of new housing and 6 percent of new jobs are projected to occur through reuse of, or additional development on, existing non-residential lots. Of the redevelopment that is projected by 2035, the majority of it is expected to occur in the latter half of the planning period. As shown in Figure 3.8, approximately 16 percent of the new housing units and 13 percent of the new jobs that occur through re-investment are projected by 2020, with the remaining projected between 2021 and 2035. Similar to the housing product mix shift, the MTP/SCS estimates that it will take time for the market trends, local plans and policies, and the economy to converge. Therefore, this type of development is weighted significantly to the later portion of the planning period. The Blueprint envisioned 13 percent of new housing and 10 percent of new jobs by 2050 to occur through reinvestment.

Figure 3.3

Housing and Employment Growth through Re-Investment



Source: SACOG, September 2011

Compact Development

Creating a plan that is more compact encourages more walking, biking, transit use, and shorter auto trips. By focusing on providing more small-lot and attached housing, maximizing infill and redevelopment opportunities, and planning for communities with a mix of uses, the MTP/SCS creates a more compact land use pattern. Just over half of the newly developed land is located in Established Communities and Center and Corridor Communities. Another 30 percent is located in Developing Communities, which for the most part, are located directly adjacent to Established Communities. This greatly contributes to the reduced impact to natural resources, as discussed below. As shown in Table 3.6, the MTP/SCS land use pattern accommodates a 40 percent population increase with only an additional 7 percent of land developed (53,266 acres).

Natural Resource Conservation

Whether for agriculture, habitat, rural home sites, urban development, recreation or open space, the use of land has implications for the viability of rural communities, agricultural operations, and natural habitats, as well as the provision of public services and the creation and maintenance of physical infrastructure. Together, these various uses of land determine the long-term economic viability and environmental sustainability of rural areas and are an important part of achieving similar objectives for the entire region. They also influence rural lifestyle, culture and heritage, which are intangible and difficult to quantify, but are nonetheless important aspects of the MTP/SCS. This MTP/SCS considers a wide range of rural and natural resources challenges and opportunities identified in the Rural-Urban Connections Strategy. See Chapter 7—Environmental Sustainability and Appendix E-4 for more information on this project and information considered in the MTP/SCS.

At the regional planning scale of the MTP/SCS, conserving natural resources preserves agriculture and habitat, and improves quality of life by providing outdoor places such as parks, open space, and other recreational areas. The housing product mix, compact development, and infill focus of the MTP/SCS land use pattern that is described above, produces a smaller overall urban footprint that maximizes the land available for these uses, while still accommodating urban development. From 1988 to 2005, the region grew by approximately 657,000 people. In that same time, approximately 200,000 acres of farmland were lost to urban and rural development—over 5 percent of the total farmland, much of which was higher-quality farmland. That growth pattern averaged nearly a third of an acre of farmland lost for every additional person. In contrast, the land use pattern in this MTP/SCS converts only 36,396 acres of farmland by 2035, an average of only 0.04 acres of farmland lost for every additional person, nearly a full order of magnitude lower impact than historical growth patterns. Approximately 4,480 acres of vernal pool complexes are converted to

development in this MTP/SCS. For a more detailed discussion of the resources considered in the MTP/SCS, see Chapter 7—Environmental Sustainability.

Design for Quality

The design details of any land use development can influence the attractiveness of living in a neighborhood and facilitate the ease of walking and biking to work or other services. Good site planning that considers the relationship to the street, sidewalks, landscaping, and other design considerations are all important factors in creating a sense of community. This is an essential Blueprint principle that will be important to the success of the MTP/SCS. The MTP/SCS considers a number of factors related to these design details, including regional accessibility and street pattern. More information on this is in Chapter 5—Plan Performance. Additionally, the MTP/SCS includes policies and strategies to support study and investment in urban design that facilitates travel by all modes. These policies and strategies are included in Chapter 6.

Table 3.11

Summary of Expected Developed Acres by Community Type

	COMMUNITY TYPE					
	Center and Corridor	Established	Developing	Rural Residential	Lands not identified for development in MTP/SCS	Region Total
2008 Existing Developed Acres[1]	25,539	266,419	23,476	406,437	n/a[2]	721,872
Percent Distribution	3.50%	36.90%	3.30%	56.30%	n/a[2]	100.00%
2008–2035						
Additional Developed Acres[1]	4,446	19,756	23,994	5,070	n/a[2]	53,266
Percent Distribution	8.30%	37.10%	45.00%	9.50%	n/a[2]	100.00%
2035						
All Developed Acres[1]	29,985	286,175	47,469	411,507	n/a[2]	775,138
Percent Distribution	3.90%	36.90%	6.10%	53.10%	n/a[2]	100.00%
Developed and Undeveloped						
All Acres[1]	36,213	373,588	103,081	712,399	2,638,152	3,863,373
Percent Distribution	0.90%	9.70%	2.70%	18.40%	68.3%[2]	100.00%

[1] Totals may not match due to rounding.

[2] The MTP/SCS does not forecast or model growth in the "Lands Not Identified for Development in MTP/SCS" Community Type during the planning period, though there is existing development in these areas (primarily farm homes, agricultural-related uses, public lands such as waste water treatment facilities, etc.) and some are identified for future urban development by general plans, spheres of influence, and/or the Blueprint. As a result, existing developed acres in the "Lands Not Identified for Development in MTP/SCS" Community Type were included in "Established" and "Rural Residential" Community Type totals. Although the MTP/SCS does not assume residential and employment growth in the "Lands Not Identified for Development in MTP/SCS " Community Type, it is likely some amount of agricultural-supporting homes and jobs will occur in these areas. Based on historical information SACOG projects this to be less than 0.5% of the regional housing growth, and less than 0.3% of regional employment growth).

Source: SACOG, September 2011.

Mixed Use Developments

The principle of mixed use developments has different applications at different scales. At the full regional scale it is discussed as "jobs-housing balance," and means a balance of jobs and households so that the region does not have to import or export either jobs or housing, beyond the normal out- and in-commuting that happens in a mobile society. For the large sub-regions, especially around the three largest employment centers, it is also desirable to attempt to replicate the regional jobs-housing balance number. At smaller scales, sometimes the best, most realistic, mix focuses more on population-serving jobs (e.g., schools, retail, etc.) and less on base, or primary, sector jobs. It is, however, still a worthy goal to try to have a strong jobs-housing mix through as many subareas of the region as possible. The MTP/SCS includes all components of this mixed use principle; however, much of the following discussion focuses on the jobs-housing balance aspect of this principle.

The MTP/SCS is, at its core, a regional transportation plan. For that reason, jobs-housing balance and the associated transportation impacts (including their quality of life and air quality impacts) is a key consideration in shaping the land use pattern. In areas with few jobs for the number of households, many workers need to commute out of their residence area to reach work. In areas with more jobs than workers, jobs must be filled by employees from outside the area. All else being equal, areas with high or low jobs-housing balance are likely to generate longer commutes for workers.

Employment often agglomerates and concentrates in specific areas. For example, industrial/ warehouse areas are usually homogeneous employment areas with little or no housing, for good reason—they can be unattractive areas in which to reside. Even for office and service employment centers, where attractive housing could be located, employment uses often out-compete housing in those centers for economic reasons. Since the adoption of the Blueprint, many of the local jurisdictions have updated their plans and policies to strive for a better jobs-housing balance within their community. This means some communities are focusing on adding jobs while others are particularly focused on adding more housing options for their current and projected workers. A goal of the MTP/SCS is to move communities closer to the regional ratio of 1.2 jobs per household for growth between 2008 and 2035. The six-county SACOG region is one of the few in the state that has an approximately even balance of current and projected jobs and housing. This is a major benefit to the region, which can be leveraged for even greater benefits if this regional jobs-housing balance can be replicated at the sub-regional level.

Traditionally, jobs-housing balance has been calculated at the regional, county or jurisdictional level, and not for subareas. As part of the MTP/SCS, SACOG began looking at jobs-housing balance within four miles of the region's major employment centers. Figure 3.9 shows these areas.

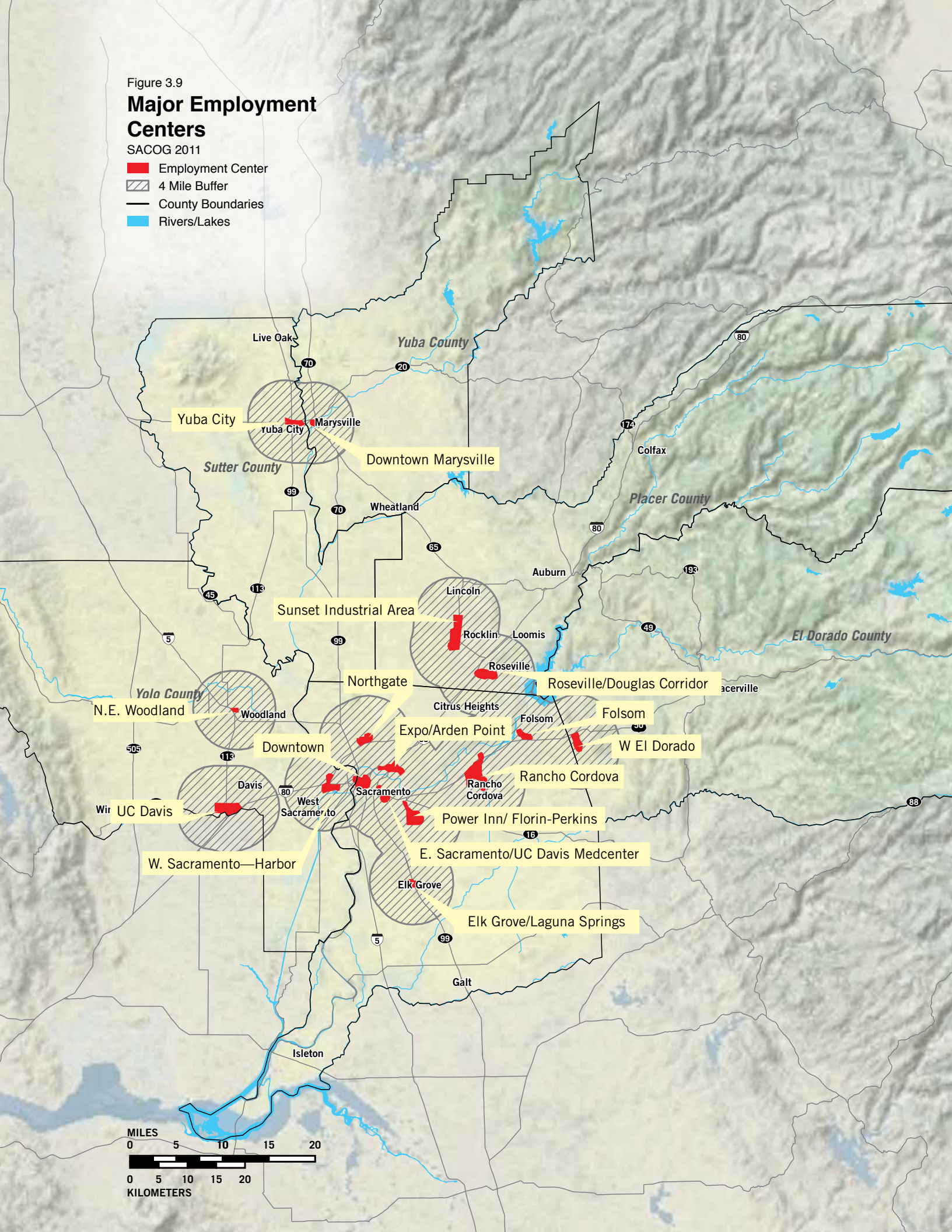


Figure 3.9
Major Employment Centers
SACOG 2011
Employment Center
4 Mile Buffer
County Boundaries
Rivers/Lakes
Live Oak
Yuba County
Yuba City
Marysville
Downtown Marysville
Sutter County
Colfax
Placer County
Wheatland
Auburn
Lincoln
Sunset Industrial Area
Rocklin
Loomis
El Dorado County
Roseville
Northgate
Roseville/Douglas Corridor
Yolo County
N.E. Woodland
Woodland
Citrus Heights
Folsom
Expo/Arden Point
Downtown
W El Dorado
Davis
Sacramento
Rancho Cordova
UC Davis
West Sacramento
Power Inn/ Florin-Perkins
E. Sacramento/UC Davis Medcenter
W. Sacramento—Harbor
Elk Grove
Elk Grove/Laguna Springs
Galt
Isleton
MILES
0 5 10 15 20
0 5 10 15 20
KILOMETERS

Table 3.7 shows that all of the region's major employment centers are projected in the MTP/SCS to move towards the 1.2 jobs-to-household ratio between 2008 and 2035.

Table 3.12
Job Housing Balance in Four-Mile Radius of Major Employment Centers

		JOBS-HOUSING BALANCE	
County	**Employment Center**	**2008**	**2035**
El Dorado	Business Park	0.98	1.14
Placer	Roseville-Douglas Corridor	0.98	1.12
Placer	Sunset Industrial Area	0.98	1.17
Sacramento	Downtown Sacramento	2.25	2.00
Sacramento	East Sac/UC Davis Medical Center	1.92	1.72
Sacramento	Power Inn/Florin-Perkins	1.34	1.18
Sacramento	Rancho Cordova	1.52	1.44
Sacramento	Folsom	1.38	1.41
Sacramento	Elk Grove/Laguna Springs	0.61	0.75
Sacramento	Expo-Arden-Point West Area	1.80	1.68
Sacramento	Northgate/North Market Area	1.14	1.22
Sutter	Yuba City/Hwy 20	1.08	1.10
Yolo	UC Davis	1.31	1.30
Yolo	West Sacramento/Harbor/ Industrial Area	2.16	1.87
Yolo	NE Woodland Industrial Area	1.47	1.44
Yuba	Downtown Marysville	1.09	1.11

Source: SACOG, September 2011

Beyond the relationship between jobs and housing, there is also an important relationship between jobs and workers. Housing has long been used as a proxy for workers and worker residence. In reality, the number of workers per household varies widely across the region, and different housing types have the capacity for accommodating different numbers of workers. Additionally, areas with "good" jobs-housing balance may still force longer commutes for workers, if available housing in the area is unaffordable to workers filling local jobs.

With support from the Federal Partnership for Sustainable Communities, described in more detail later in this chapter, SACOG is now working on a "jobs-housing fit" measure that can better assess the "fit" at a smaller geographic scale between the wages paid to local workers and the cost of housing. This measure will provide more detailed information for regional and local planning efforts on local employment and housing demand.

While the Blueprint and MTP/SCS strive to improve jobs-housing balance throughout the region it is important to acknowledge that some people will always choose to commute long distances to work. There are many reasons for this, including two-person households, cost of housing, quality of schools and lifestyle preferences. The MTP/SCS does not strive to eliminate those choices, but rather to increase the choices of people who wish to live closer to their place of employment. The transportation investments in the MTP/SCS provide investments for both short- and long-range commuters.

Provide Transportation Choice

Providing transportation choice increases opportunities for non-vehicle travel, an essential Blueprint principle and MTP/SCS component. The more people walk, bicycle, or take transit, the less they will drive, which reduces the mileage the average household drives in a day, commonly known as vehicle miles traveled (VMT). In the MTP/SCS, VMT reduction is the primary driver of GHG reduction. However, providing transportation choice without all of the other land use considerations discussed above would not result in as much VMT reduction as it does with it, and conversely the other land use factors would not reduce VMT as much as when paired with key transit investments. Increased development in Center and Corridor Communities supports increased transit investment and complete streets investment, which provides a transportation system that supports increased transit use, bicycling, and walking. Better balancing of housing and jobs around the region, and bringing shopping, employment, housing and services closer together through better mixing and compact development, supports shorter and fewer vehicle trips. Chapter 4 provides detail on the transportation investments that have been tailored to the land use pattern in this MTP/SCS. Chapter 4 also discusses unfunded road maintenance/rehabilitation and transit operation projects that are not in the MTP/SCS due to the financial constraints, but also support the land use pattern of the plan and, if funding becomes available, could further enhance implementation of the plan by 2035.

Transit Priority Areas Framework

A subset of the MTP/SCS housing and employment growth falls within what SACOG refers to as Transit Priority Areas (TPAs). TPAs are areas of the region within one-half mile of a major transit stop (existing or planned light rail, street car, or train station) or an existing or planned high-quality transit corridor included in the MTP/SCS. A high-quality transit corridor is a corridor with fixed route bus service with service intervals no longer than 15 minutes during peak commute hours (Pub. Res. Code, § 1155.) SACOG uses this definition of TPAs because it coincides with the definition of Transit Priority Projects in SB 375 which, as discussed below, are eligible for CEQA streamlining benefits. Figure 3.2 (found earlier in this chapter) illustrates the relationship of the TPAs to the Community Types. TPAs are considered an overlay geography and do not necessarily correspond directly to Community Types.

While substantial overlap exists between TPAs and Center and Corridor Communities, TPAs provide additional opportunities to realize the benefits of smart land use during the MTP/SCS planning period. These include:

- using SB 375 CEQA streamlining benefits available to qualifying residential and mixed-use projects to facilitate transit-oriented development;
- increasing housing choices located near high quality transit, while bringing high-quality transit service to an additional 152,216 existing housing units and 240,013 existing employees;
- increasing ridership to support existing and new rail and bus services and reduce vehicle miles traveled and GHG emissions;
- increasing farebox recovery rates, or the ability for rider fares to cover a larger share of the costs of transit service; and
- increasing equity by increasing housing and transportation choices and transit access to jobs, schools, services for low-income residents, as described more fully in Chapter 8—Equity and Choice.

Placer Transit Priority Areas

The Placer TPAs cover Capitol Corridor train station areas in the cities of Roseville, Rocklin and Auburn, as well as high-quality bus routes in the city of Roseville. New development in the Placer TPAs is employment heavy, due primarily to the concentration of transit serving the Roseville employment centers along the Interstate 80 corridor.

Sacramento Transit Priority Areas

The Sacramento TPAs cover several types of transit routes: light rail station areas within the cities of Folsom, Rancho Cordova, and Sacramento, and unincorporated Sacramento County; a Capitol Corridor train station area in the City of Sacramento; a street car corridor in the central/downtown area of the City of Sacramento and in Rancho Cordova, and numerous bus and bus rapid transit routes in the cities of Citrus Heights, Rancho Cordova, Sacramento, and unincorporated Sacramento County. New development in the Sacramento TPAs is fairly balanced between housing and employment growth due in part to the extensive geographic coverage of the TPAs, which include regional job centers (e.g., downtown Sacramento and Rancho Cordova) as well as residential areas and commercial areas. In Sacramento County in particular, most of the cities and the unincorporated county have initiated commercial corridor plans intended to allow significantly more residential development than allowed under past land use plans.

Yolo Transit Priority Areas

The Yolo TPAs cover a Capitol Corridor train station in the city of Davis, a street car corridor in central area of West Sacramento, and numerous bus and bus rapid transit routes in the cities of Davis and West Sacramento. New development in the Yolo TPAs is fairly balanced between housing and employment growth due in part to the extensive geographic coverage of the TPAs, which include regional job centers (e.g., downtown West Sacramento and UC Davis) as well as residential areas and commercial areas.

MTP/SCS Land Use Distribution According to Transit Priority Areas

Transit is most efficient where there are higher densities of people so locating more new homes and jobs near transit maximizes the transit investment of the MTP/SCS. Within the Transit Priority Areas, several local governments are working to encourage more housing and employment near existing and planned transit service. In 2008, 14 percent of housing units and 27 percent of employees were within areas that meet the definition of Transit Priority Areas. In support of the Blueprint principles and local land use plans, a primary goal of the MTP/SCS is to increase the number of people—both residents and employees—who have access to high-quality transit. By 2035, the MTP/SCS puts 38 percent of new dwelling units and 39 percent of new employees within TPAs plus brings high-quality transit service to an additional 152,216 existing dwelling units and 240,013 existing employees. By maximizing ridership, the MTP/SCS is able to increase fare box recovery (the ability for fares to help cover the true cost of transit) and reduce VMT and GHG emissions.

Tables 3.8 and 3.9 show the total housing and employment in the TPAs as well as the housing product mix.

Table 3.13

Summary of Housing and Employment within Transit Priority Areas[1] (Dwelling Units, Employees)

Transit Priority Area (TPA)[1]	Placer TPA	Sacramento TPA	Yolo TPA	All TPAs
2008 Existing Dwelling Units	2,788	107,069	16,837	126,694
2008 Existing Employees	5,843	230,081	25,738	261,662
2035 Existing Dwelling Units	9,553	125,729	21,934	157,216
2035 Existing Employees	37,226	182,471	20,316	240,013
2035 New Dwelling Units	2,561	92,124	19,781	114,466
2035 New Employees	10,150	107,520	22,004	139,674
2035 All Dwelling Units	14,902	324,922	58,552	398,376
2035 All Employees	53,219	520,072	68,058	641,349

[1] Transit Priority Areas are those areas of the region within one-half mile of a major transit stop (existing or planned light rail, street car, or train station) or high-quality transit corridor. A high-quality transit corridor is a corridor with fixed route bus service with service intervals no longer than 15 minutes during peak commute hours (Public Resources Code § 1155).

Source: SACOG, September 2011

Table 3.14
Summary of New Housing Product Distribution in TPAs by County (Percent)

Transit Priority Area (TPA)[1]	Rural Residential	Large-Lot Single-Family	Small-Lot Single-Family	Attached
Placer TPA	0%	11%	9%	80%
Sacramento TPA	0%	4%	19%	77%
Yolo TPA	0%	5%	14%	81%
All TPAs	**0%**	**4%**	**18%**	**78%**

[1] Transit Priority Areas are those areas of the region within one-half mile of a major transit stop (existing or planned light rail, street car, or train station) or high-quality transit corridor. A high-quality transit corridor is a corridor with fixed route bus service with service intervals no longer than 15 minutes during peak commute hours (Public Resources Code § 1155).

Source: SACOG, September 2011.

An additional benefit to adding more housing and jobs near transit and adding more transit near existing homes and jobs is that it brings more new high quality transit to existing concentrations of low income residents. Locating jobs and services near low-income communities and providing non-auto transportation alternatives to these areas is an important social equity consideration that is included in the MTP/SCS land use pattern and growth assumptions and discussed in more detail in Chapter 8—Equity and Choice.

Because much of the growth in TPAs is also in Center and Corridor Communities, the discussion earlier in this chapter relating to the timing of growth assumed is similar in TPAs. However, transit-oriented development in TPAs faces particular challenges:

Local Policies
Plans and zoning codes may not allow the level of residential and employment density required to support high-quality transit.

Parking
Existing parking standards may need revision to create an optimal balance between parking for residential and non-residential uses, paid and unpaid parking, and encouraging transit use. High parking requirements can have a significant negative impact on the economic viability of transit oriented development projects.

Transit-Oriented Development Rather than Transit-Adjacent Development
If projects near high-quality transit are dominated by auto-oriented uses, community residents may not benefit fully from the service. Transit-oriented development creates activity centers around transit that reflect the character of their surrounding communities, support pedestrian and bicycle connections and safe transit access, and promote housing choices, healthy businesses and active and attractive public spaces.

Mix of Uses
Without planning or coordination, permitted uses in TPAs can fail to create complementary activities along a transit corridor or to meet the daily needs and interests of residents and employees in a TPA.

Housing Choice and Gentrification
Transit-oriented development in some communities has been so successful that it has resulted in higher real estate values, more high-end housing, and increased rents. Lower-income residents often represent the core of transit riders, so a mix of incomes and the preservation and expansion of housing choices affordable to lower-income households near high-quality transit is important. Yet, community opposition to affordable rentals often remains a challenge if projects are not permitted by right.

Transit Funding
Although the MTP/SCS provides for significant transit funding through 2035, the level of future federal and state transit funding remains uncertain, which could affect transit development and service provided in TPAs over the life of the plan. Encouraging transit use throughout the day for all types of trips makes the most efficient use of the transit system.

Activating Opportunities in Transit Priority Areas
Opportunities to incentivize housing and mixed use development near transit are offered in California under SB 375. With funding through the U.S. Department of Housing and Urban Development (HUD) from the Federal Partnership for Sustainable Communities, SACOG is conducting five case studies of transit-oriented development (TOD) to examine the barriers and opportunities for TOD in the region. This grant work supports analysis to help activate development in the five TPA case study areas. The work is bottom-up, informed by the grant advisory group, the Regional Consortium for Sustainable Communities, including its four working groups on Equity, Housing & Health; Natural Resources; Infrastructure; and Economic Development. Part of the TPA work includes working with the local residents to better understand what TOD looks like in their community and to build consensus. The Urban Land Institute Sacramento District Council is a partner in this work and is providing case study reports of each area, with recommendations for how the process can be replicated in similar types of communities in the region, state, and nation.

Applications of the SCS

Since the adoption of the 2008 MTP, California passed the Sustainable Communities and Climate Protection Act, Senate Bill 375 (Stats 2008, Ch. 728). This law focuses on aligning transportation, housing, and other land uses to, among other things, achieve greenhouse gas (GHG) emissions reduction targets established by the California Air Resources Board (ARB). As set forth in the Climate Change Scoping Plan, California's comprehensive strategy to reduce GHG emissions under the California Global Warming Solutions Act, Assembly Bill 32 (Stats 2006, Ch. 488), while other measures address GHG emissions reductions through alternative fuels and vehicle efficiency, SB 375 is the state's strategy to reduce GHG emissions by more effectively integrating land use and transportation. SB 375 requires California MPOs to develop an SCS as part of the MTP, which identifies policies and strategies to reduce per capita passenger vehicle-generated GHG emissions. This effort focuses on encouraging efficient land use patterns that not only reduce vehicle travel but also accommodate an adequate supply of housing, reduce impacts on valuable habitat and productive farmland, increase resource use efficiency, and promote a prosperous regional economy.

In application, the SCS must identify the general location of land uses, residential densities, and building intensities within the region; identify areas within the region sufficient to house all the population of the region; identify areas within the region sufficient to house an 8-year projection of the regional housing need; identify a transportation network to serve the regional transportation needs; gather and consider the best practically available scientific information regarding resource areas and farmland in the region; consider the state housing goals; set forth a forecasted development pattern for the region; and allow the regional transportation plan to comply with the federal Clean Air Act. (Gov. Code, § 65080, subd. (b)(F)(2)(B).) If the SCS does not achieve the GHG emissions reduction targets set by ARB, an Alternative Planning Strategy (APS) must be developed to demonstrate how the targets could be achieved.

Although a recent law, the coordinated land use and transportation planning envisioned by SB 375 is aligned with the direction the Sacramento region has been heading for nearly a decade, as reflected in the coordination between the Blueprint Vision and the 2008 MTP. As shown in local government land use plans, research studies, and market conditions, the region continues to support and implement Blueprint-like land use patterns and principles. Therefore, rather than initiating a new approach, the creation of the SCS will serve to further integrate the Blueprint and the MTP by melding the land use and transportation planning principles of the two projects, and by tying the plan's performance to GHG emission reduction targets through reduced automotive travel and increased walking, bicycling and transit use based on land use patterns consistent with the region's Blueprint. Nevertheless, the MTP/SCS creates voluntary incentives, but does not require, local general plans to incorporate its growth forecast and land use policies.

Implementing SB 375 and CEQA Streamlining

In many respects, SB 375 did not alter the basic components and steps—many of which derive from federal law and could not be superseded by state law—for developing the Metropolitan Transportation Plan. SB 375 adds new requirements and opportunities in four areas: the inclusion of an SCS that, as noted, strives to achieve, if feasible, a passenger vehicle GHG emissions reductions target; additional consideration in the plan of natural resource and farmland impacts; CEQA streamlining benefits to assist qualifying housing projects consistent with the SCS; and alignment of the MTP/SCS process with the RHNA process, including the extension of the time period for local jurisdiction housing element updates.

With respect to the requirement to include an SCS, as apparent from the discussion above, SACOG always has been required to develop and incorporate into the MTP a projected land use pattern for the region based upon a growth forecast and allocation. SB 375 builds on those requirements, adding for example the consideration of natural resource and farmland impacts, but it did not alter much of the state-of-the-art and nationally-recognized planning techniques, modeling tools, and public engagement strategies SACOG has employed over the last decade to develop prior MTPs and the Blueprint.

The most significant change resulting from SB 375 is the creation of CEQA streamlining incentives to assist and encourage residential and mixed use housing projects consistent with the SCS and, in particular, in Transit Priority Areas. The CEQA benefits available under SB 375 are for residential and residential mixed-use projects that are consistent with the general use designation, density, building intensity, and applicable policies specified for the project area in the SCS. The CEQA benefits provided by SB 375 apply to three types of projects. Below is a summary of the types of development projects eligible for these CEQA benefits, specific qualifications for each project, and the types of CEQA streamlining available to each type of project.

Table 3.15
SB 375 CEQA Benefits

Project Designation	Qualifications	Streamlining Benefits
Mixed Use Residential Project	• At least 75% of total building square footage for residential use • Consistent with the use designation, density, building intensity, and applicable policies for the project area of an SCS or APS accepted by ARB *or* • A Transit Priority Project as defined below	Environmental documents are not required to reference, describe or discuss: 1) growth-inducing impacts, 2) impacts on transportation or climate change of increased car and truck VMT induced by project, 3) reduced-density alternative to project.
Transit Priority Project	• At least 50% of total building square footage for residential use *or* • If 26-50% of total building square footage is non-residential, a minimum FAR of 0.75 • Minimum net density of 20 du/acre • Within 0.5 miles of major transit stop or high-quality transit corridor included in the regional transportation plan (No parcel more than 25% further, and less than 10% of units or no more than 100 units further than 0.5 miles) • Consistent with the use designation, density, building intensity, and applicable policies of an SCS or APS	Benefits described above PLUS: • Option to review under a "Sustainable Communities Environmental Assessment" • An Initial Study is prepared identifying significant or potentially significant impacts. • Where the lead agency determines that cumulative impacts have been addressed and mitigated in SCS/APS, they will not be "considerable." • Off-site alternatives do not need to be addressed. • Deferential review standard—the burden of proof for legal challenge is on the petitioner/plaintiff. • Traffic control/mitigation may be covered by SCS/APS.
Sustainable Communities Project	Everything for Transit Priority Project PLUS: • Served by existing utilities • Does not contain wetlands or riparian areas • Does not have significant value as a wildlife habitat and does not harm any protected species • Not on the Cortese List • Not on developed open space • No impacts to historic resources • No risks from hazardous substances • No wildfire, seismic, flood, public health risk • 15% more energy-efficient than CA requirements and 25% more water-efficient than average for community • No more than 8 acres • No more than 200 units • No building greater than 75,000 square feet • No net loss of affordable housing • Compatible with surrounding industrial uses • Within ½-mile of rail/ferry or ¼-mile of high quality bus line • Meets minimum affordable housing requirements as prescribed in SB 375 OR in-lieu fee paid OR 5 acres of open space per 1,000 residents provided	Exempt from CEQA

Source: SACOG, September 2011.

These streamlining provisions merely provide opportunities for local land use actions and do not prohibit the planning or development of any particular form of housing development. By express provision, SB 375 does not supersede the land use authority of a city or county and does not regulate the use of land. Projects that use the SB 375 CEQA provisions still must obtain discretionary permits or other approvals from lead and responsible agencies in accordance with local codes and procedures. Moreover, SB 375 does not change how CEQA applies to projects that are inconsistent with the SCS or APS. As these CEQA benefits are designed to incentivize development projects consistent with the MTP/SCS, there is no disincentive for development projects not in the MTP/SCS. As noted, CEQA does not mandate that local agencies use the MTP/SCS to regulate GHG emissions or for any other purpose. Local government land use authority remains unchanged by SB 375; jurisdictions can consider, review, and approve any land use project by the same process and guidelines they use currently.

Although this MTP/SCS has no regulatory authority over local land use decisions, it provides information about the SCS so that local jurisdictions can determine whether a project is consistent with the SCS, and therefore, eligible for the CEQA benefits based on consistency with the SCS. To determine a project's consistency with the SCS, a jurisdiction must find it consistent with the general land use, density, intensity, and any applicable land use policies of the SCS. Additional information by jurisdiction and community type is provided in Appendix E-3. SACOG will provide assistance to a local jurisdiction in making this determination if the local jurisdiction requests such assistance.

Delta Reform Act

In November 2009, the California Legislature enacted SBX7 1, the Delta Reform Act, one of several bills passed at that time related to water supply reliability, ecosystem health, and the Delta. The Delta Reform Act created the Delta Stewardship Council (DSC). The DSC is made up of seven members that are advised by a 10-member board of scientists. The DSC is charged with developing and adopting a Delta Plan by January 1, 2012. The DSC is tasked with addressing the coequal goals of providing a more reliable water supply for California and protecting, restoring, and enhancing the Delta ecosystem. According to the Delta Reform Act, the coequal goals shall be achieved in a manner that protects and enhances the unique cultural, recreational, natural resource, and agricultural values of the Delta as an evolving place.

Under the Delta Reform Act, the DSC is charged with reviewing and advising local and regional agencies regarding the consistency of local and regional planning documents, including an SCS, with the Delta Plan. The DSC's input includes reviewing the consistency of local and regional plans with the ecosystem restoration needs of the Delta and the whether the lands set aside for natural resource protection are sufficient to meet the Delta's ecosystem needs. The Act requires that "covered actions," as defined by the Act, and which include plans, programs, or projects within the primary or secondary zones of the Delta, be consistent with the Delta Plan.

The Act also requires a metropolitan planning organization adopting a plan for lands overlapping with the primary or secondary zones of the Delta to follow a consultation procedure with the DSC, including an early consultation to review the consistency of such plans with the Delta Plan. Although the DSC has not yet adopted the Delta Plan, SACOG has consulted with the DSC and will follow the Delta Reform Act's consultation requirements. SACOG has considered the coequal goals of the Act in developing the MTP/SCS.

Finally, the Act expressly provides that "covered actions" do not include the following: (1) regional transportation plans, such as this MTP/SCS; and (2) plans, programs, projects, activities (and any infrastructure necessary to support those plans, programs, projects, or activities) within the secondary zone of the Delta that SACOG has determined is consistent with the SCS. (Cal. Water Code, § 85057.5.)

Chapter 4

Summary of Budget and Investments

This chapter discusses the investment decisions and revenue assumptions contained in the MTP/SCS. The chapter begins with a summary of the investments in the plan, describing the major expenditure categories and strategies and highlighting specific regional projects. This is followed by a general discussion of where revenues to support the plan come from and their limitations. The final section discusses how the region will implement the MTP/SCS plan investments through subsequent programming actions.

Investment Summary of the MTP/SCS

The MTP/SCS will make investments totaling $35.2 billion (in current dollars) to improve the regional transportation system. Table 4.1 on the next page shows the general categories of investment included in the MTP/SCS through 2035. These are expressed in current dollars as well as year-of-expenditure dollars. The federal Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) requires that all cost estimates be escalated to year-of-expenditure (YOE) values, to reflect both the likely decrease in purchasing power of today's dollar and increase in costs for maintaining and building the transportation system over the next 25 years.

Table 4.1
Summary of MTP/SCS Investments

		TOTAL BUDGET- 2011 THROUGH 2035 (IN BILLIONS)			
	Program Category	**MTP/ SCS**	**2008 MTP**	**Total Change**	**Change per Capita**
1	**Maintenance & Rehabilitation (Current Year $*)**	**$11.5**	**$12.0**	**-4%**	**4%**
	Year of Expenditure $	$16.4	$20.2		
	Maintain Caltrans highways & freeways, maintain local streets& roads, safety investments as part of rehabilitation projects				
2	**Road Capital & Operations Projects (Current Year $*)**	**$7.4**	**$9.3**	**-20%**	**-14%**
	Year of Expenditure $	$10.5	$15.7		
	New & widened roads, river crossings, interchanges, etc. ($5.9 billion, 30% lower than 2008 MTP total), safety projects, technology and operational improvements				
3	**Transit (Current Year $*)**	**$11.3**	**$13.6**	**-17%**	**-10%**
	Year of Expenditure $	$15.9	$22.9		
	Bus and Rail Operations and Maintenance (70 percent of total expenditures), Strategic Bus & Rail Infrastructure Expansion, ADA Paratransit Services				
4	**Bike/Pedestrian (Current Year $*)**	**$2.8**	**$2.9**	**-1%**	**5%**
	Year of Expenditure $	$4.0	$4.9		
	Bicycle Facilities, Pedestrian Improvements, ADA retrofits				
5	**Programs, Planning, Enhancements (Current Year $*)**	**$2.2**	**$2.4**	**-8%**	**0%**
	Year of Expenditure $	$3.1	$4.0		
	Project Analysis and Development, Community Design Program, Air Quality Programs, TDM & Traveler Information, Landscaping & Transportation Enhancements				
	Grand Totals (Current Year $*)	**$35.2**	**40.2**	**-13%**	**-5%**
	Year of Expenditure $	**$49.8**	**$67.7**		

* See Appendix B-1 for documentation of how costs and revenues are calculated and noted throughout this plan in order to meet SAFETEA-LU financial reporting requirements.

Source: SACOG, September 2011.

MTP/SCS Projects and Investments

The transportation projects contained in the MTP/SCS are matched to the available revenues for the planning period. The general level, type, and extent of investments covered by the MTP/SCS are described in more detail below.

- $11.5 billion ($16.4 billion YOE) goes to road and highway maintenance and rehabilitation, including routine maintenance, major reconstructions, and various safety improvements.
- $11.3 billion ($15.9 billion YOE) goes to transit investments, including rail extensions and a 95 percent increase in bus service hours. An estimated $3.4 billion ($4.8 billion YOE) in capital investments support the $7.9 billion ($11.1 billion YOE) needed to operate these transit services.
- $7.4 billion ($10.5 billion YOE) goes to road and highway capital improvements, including intersection improvements, safety projects, signal timing, road widening in growth areas, and new connections for local access.
- $2.8 billion ($4.0 billion YOE) goes to bicycle and pedestrian improvements, including bicycle trails, sidewalks, ADA retrofits, and supporting facilities. In addition, an estimated 8 percent or more of the road capital projects have a bicycle or pedestrian feature that is not included separately in the bicycle and pedestrian improvement allocation.
- $2.2 billion ($3.1 billion YOE) for other types of improvements important to achieving regional goals, including project development and analysis, community design incentives, travel demand management (including the regional rideshare program), clean air, open space, technology deployment, and enhancement programs.

Table 4.2 on the next page provides a set of key projects from the MTP/SCS. Appendix A-1 includes the full listing of projects.

Table 4.2
Table of Illustrative Projects

New Rail	Draft Preferred Scenario
Rail	Blue Line extension from Meadowview to Cosumnes River College (by 2020)
	Capitol Corridor connecting Placer County, Sacramento, and Yolo Counties to the Bay Area (by 2020)
	Green Line extension from Downtown Sacramento to Sacramento International Airport (by 2035)
	Downtown Sacramento to West Sacramento streetcar starter, with Midtown loop extensions (Phased completion)
	Rancho Cordova Town Center Loop Streetcar (by 2035)
	High Speed Rail — Altamont connection from points south, terminating at Sacramento Valley station (by 2035)
New Bus	**Draft Preferred Scenario**
Local & Express Buses, Neighborhood Shuttles	Increase bus service with 15 minute or better service from 14% in 2008 to 45% (by 2035)
Bus Rapid Transit (BRT)	Nine BRT lines with 15–30-minute service connecting Roseville, eastern Sac County, Citrus Heights, northern Sac County, Natomas, Rancho Cordova, South Sac, Elk Grove, Downtown (Phased Completion)
	Various street & operational improvements coordinated with complete streets corridor enhancements to enhance bus transit (Phased Completion)
New Bike/Pedestrian	**Draft Preferred Scenario**
Bike Lanes, Complete Streets & Recreational Trails	Increase of 5% per capita in travel mode expenditure from MTP2035. Emphasis on complete street connections within and between cities and to transit and school facilities (Phased Completion)
New Roads	**Draft Preferred Scenario**
US 50 El Dorado	Carpool lane extension, Bass Lake Rd to Cameron Park Dr (by 2020)
	Carpool lane extension, Cameron Park Dr to Greenstone Rd (by 2035)
	New auxiliary lanes on US50 with connected parallel roads between El Dorado Hills and Shingle Springs (by 2035)
	4-lane Green Valley Road, Folsom to El Dorado Hills (by 2035)
US 50 Sacramento	New carpool lanes, Sunrise Boulevard to Watt Ave (by 2020)
	New carpool lanes, Watt Ave to downtown Sacramento (by 2035)
	Modified interchange operational improvements at US50 & SR99, US50 & I-5 (Phased Completion)
	New auxiliary lanes, various locations in Sacramento, Rancho Cordova, and Folsom (Phased Completion)

New Roads	Draft Preferred Scenario
I-80 & I-5 Yolo/North Sacramento	New auxiliary lanes from Del Paso Rd. to Hwy. 99 (by 2020)
	I-5/SR 113 interchange Phase II and full project development for Phase III (by 2020)
	I-5/State Route 99 interchange improvements (by 2020)
	New carpool lanes on I-80 and U.S. 50 connecting Davis to Downtown Sacramento, with new bike bridge across the Yolo Causeway (by 2035)
	New carpool lanes on I-5 and I-80 to downtown Sacramento (by 2035)
I-80 Sacramento	Carpool lane extension, Watt/Longview west to I-5 (by 2020)
	Business 80/Capital City freeway operational improvements (by 2035)
	Roseville Road widened to 4 lanes, from Watt Ave to Placer County Line, with ext. onto SR 160 (by 2035)
I-80 Placer	Carpool lane extension + 2 new auxiliary lanes, Sac. County line to SR65 (by 2020)
	I-80/SR 65 interchange—partial interchange rebuild (by 2035)
SR 65	Lincoln Bypass, 2 & 4 lane expressway (by 2020)
	Operational improvements in Marysville through area where SR 20, 65 and 70 come together (by 2020)
	Wheatland Parkway: right-of-way preservation and project development efforts—post-2035 construction (Phased Completion)
	Project development for carpool lanes I-80 to Blue Oaks (Phased Completion)
Placer Parkway	New 4-lane divided facility from SR 65 to Watt Ave; Interchange at SR 65 Whitney Ranch; at-grade crossings at Fiddyment, Foothills, and Watt (by 2020)
SR 99/70, Sacramento, Sutter & Yuba	Operational improvements between I-5 and Placer Parkway—intersection improvements only (Phased Completion)
I-5 South, Sacramento	New carpool lanes, downtown Sacramento to Elk Grove Boulevard (by 2035)
SR 99, Sacramento	New auxiliary lanes, Elk Grove Blvd. to Laguna Blvd (by 2035)
Elk Grove-Rancho Cordova-El Dorado Connector	Kammerer at 4 lanes from I-5 to Bruceville, 6 lanes from Bruceville to 99. Grant Line at 4 lanes between 99 and White Rock with right-of-way preserved. White Rock at 4 lanes from Grant Line to US 50 in El Dorado County (Phased Completion)
Bridges	Draft Preferred Scenario
New River Crossings	5th St. Feather River bridge rebuilt/widened to 4 lanes (by 2020)
	10th St. Feather River bridge widened to 6 lanes (by 2035)
	New north and south Sacramento River Crossings—alignments under review (by 2035)
	New all-modal river crossing between Downtown and Natomas (by 2035)

Road & Highway Maintenance & Rehabilitation

Emphasis on road maintenance and rehabilitation to help keep the transportation system in a state of good repair.

The plan area covers an estimated 22,000 lane miles of existing collector and local streets, over 5,000 lane miles of freeway, high-occupancy vehicle (HOV), auxiliary, expressway, and arterials, and numerous small and large bridges that must be kept in a good state of repair for the transportation system to operate efficiently.

The maintenance and rehabilitation budget spends $11.5 billion ($16.4 billion YOE), to preserve, maintain, and rehabilitate the region's roads, highways, bridges, trails, sidewalks and other bicycle and pedestrian facilities. Despite a 4 percent decline in absolute funding levels, maintenance and rehabilitation funding increases by 4 percent per capita from the 2008 MTP funding levels. Of the overall total, an estimated 5 percent, or nearly $600 million, is spent on bicycle and pedestrian facilities as part of maintenance and rehabilitation projects.

Nearly 57 percent of the maintenance and rehabilitation budget is related to city and county maintenance of local streets and facilities. In current dollars, the MTP/SCS sustains average investments between $200 and $300 million per year through 2035 for local roads, bridge, bicycle and pedestrian facilities. The state-maintained highway system consumes the remaining 43 percent, with Caltrans maintaining the region's highway system with around $200 million annually from state funding sources.

Types of maintenance and rehabilitation projects include:

- Routine and preventive maintenance projects intended to extend the life of roads, and highways, including sealing cracks, repairing pavement, cleaning and repairing drains, fixing signals, and sweeping streets;
- More extensive repair, rehabilitation, and reconstruction of roadways, including sealing pavement, repaving, reconstructing subgrade and drainage, and reconfiguring intersections; and
- Bicycle, pedestrian, safety and aesthetic improvements, such as striping, curb ramps, sidewalk gap closures, rail crossings, and landscaping as part of larger rehabilitation projects.
- Replacement, rehabilitation, painting, scour countermeasures, and bridge approach barrier and railing replacements on local and state-owned bridges.

In addition to the direct investments assumed for the bicycle and pedestrian budget, discussed below, an estimated 20 to 30 percent of the roadway investments in the project list include bicycle and pedestrian components such as striping and signage, sidewalk gap closures, ADA retrofits, and intersection improvements.

- New "complete streets" projects take the place of many of the reduced or deferred road capacity projects discussed below. While in the past, the planning, design, construction and operation of a street widening or new street might have focused on vehicular capacity and flow only, complete streets projects balance the needs of all potential users of a street. Specifically, complete streets are roadways that provide for the effective movement of all public right-of-way users. Complete streets do more than just provide facilities for pedestrians, bicycles, transit, and cars. They include consideration of ADA accessibility, comfort and safety of all users, quality of life, regional and local transportation demand, and goods movement. The 2008 MTP included complete streets strategies, and since that time SACOG has developed a toolkit for implementation of complete streets, and provided additional guidance and definition for complete streets projects. See SACOG's Complete Streets webpage for more information on the toolkit and SACOG's complete streets activities at http://www.sacog.org/complete-streets/
- SACOG estimates that at least 33 percent of the projects in the MTP/SCS include complete streets elements, representing a significant increase from the 2008 MTP. However, do to the nature of the project list being a long-term investment strategy, some listed projects have not yet been studied to the point where the described scope includes all elements that will ultimately be included in the project. Because of this fact, SACOG anticipates a much higher share of projects to include complete streets elements. The MTP/SCS makes provisions for this by including lump sums in the project list for bicycle, pedestrian, and roadway improvements that can improve a roadway's accessibility to all users and through policies and strategies that encourage complete streets considerations whenever feasible. In addition to the plan's increased investment in complete streets along urban corridors, there is also an increase in investment in complete corridor treatments in rural communities, where closing a shoulder gap or improving a county road intersection can significantly improve the safety of travel for all modes.

Public Transit Investments

Emphasis on frequent and reliable bus and rail services along corridors that have transit-supportive land uses.

The MTP/SCS provides $11.3 billion ($15.9 billion YOE) in transit capital and operating investments. Most of this investment, two-thirds of the total, is consumed by the cost of operating and maintaining the transit system. Intercity rail operations take up about 7 percent of the transit budget or roughly $800 million and are covered by state funding outside the control of regional operators. The balance pays for capital expenses such as purchasing new buses and rail vehicles, infrastructure associated with adding routes and stations to the bus and rail system, building new storage and maintenance facilities, and improvements to help buses move more quickly through traffic. The State funds capital improvements on the intercity rail system through the interregional share of State Transportation Improvement Program (STIP) funds. Despite a shift of more than $2 billion in flexible funds from road to transit purposes in the MTP/SCS, the slower regional growth and volatility of dedicated transit revenues result in an MTP/SCS investment level that is 10 percent per capita below the 2008 MTP levels.

Increased operational efficiencies are a key aspect of the MTP/SCS in addressing the transit operations funding challenge. In the MTP/SCS, existing transit services are assumed to continue while new transit investments focus on the corridors with more compact and mixed land uses that are most capable of supporting robust transit service.

Providing high-frequency service of 15 minutes or better in areas with more compact and mixed uses allows the MTP/SCS to provide more cost-effective and productive transit service. The result is a 72 percent increase in regionwide transit productivity over levels in the 2008 MTP. Because of higher productivity, there is a significantly higher percentage of operating costs covered by fares – rising from 24 percent of operating costs in 2009 to 38 percent of operating costs ($2.3 billion) by 2035**.** Saving public dollars through higher farebox recovery allows the transit investments in the MTP/SCS to have a larger impact. With the increased transit productivity, the MTP/SCS results in a total daily transit trip increase of 256 percent, while only increasing transit service hours by 98 percent from 2008 levels. Additional discussion of transit productivity is provided in Chapters 5 and 10.

The MTP/SCS provides increased transit coverage across the region, but focuses on corridors with land uses that support productive transit services. Total daily vehicle service hours increase by 98 percent from 4,074 to 8,062 hours. The types of transit offered in the plan vary by areas of the region. Investments include increasing the amount of service on existing routes, introducing new services, and adding high-capacity rail to high-demand corridors. The resulting 2035 transit network is depicted in Figure 4.1.

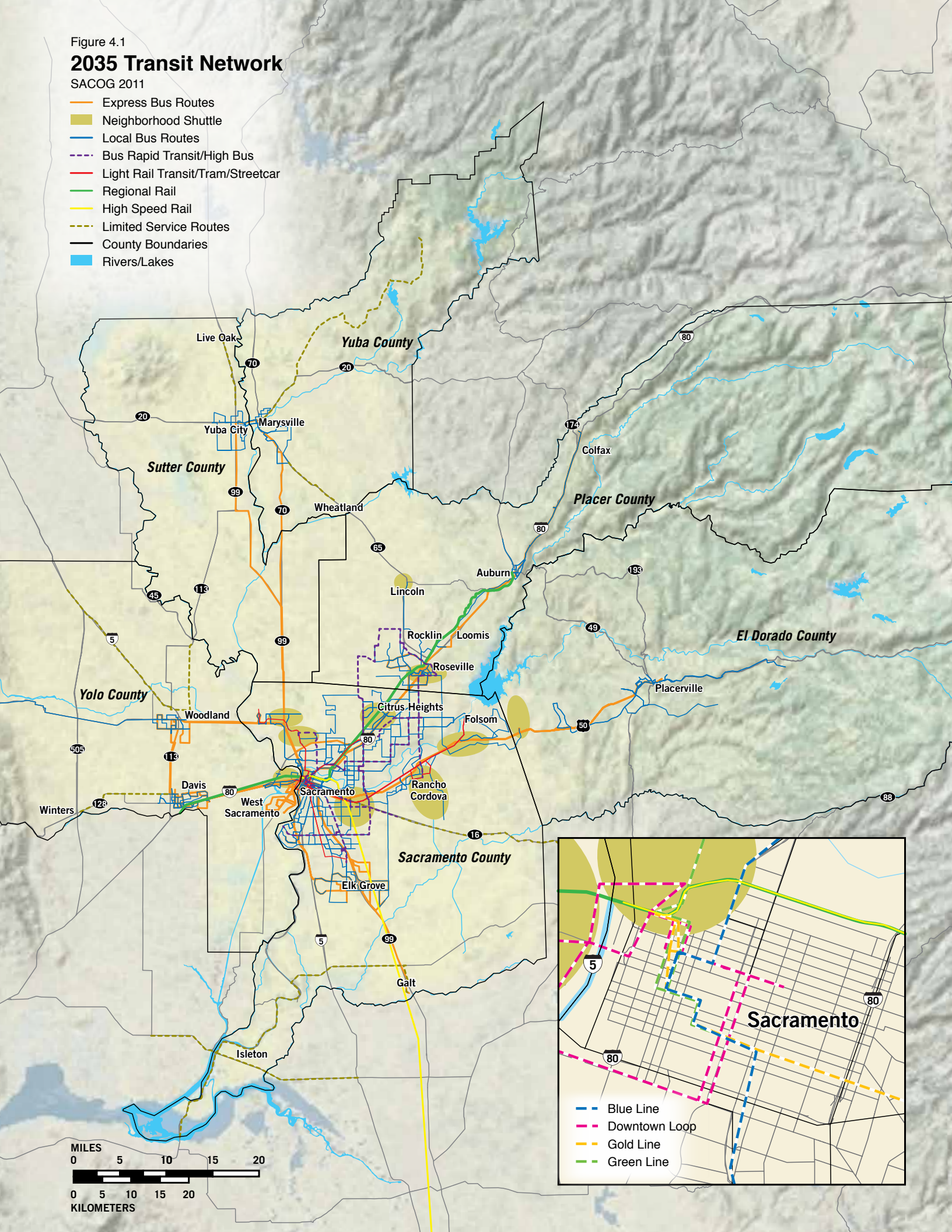
Types of MTP/SCS transit projects include:

- Increased transit options in local areas to better match transit type to the density of development and related demand for service. Options range from increasing the amount of service on existing fixed route and express bus lines, to introducing new services including Bus Rapid Transit and neighborhood shuttles.
- More frequent transit service with greater regional coverage, with 15-minute or less service on many corridors. The plan calls for 53 percent of all transit services (bus and rail) to operate 15-minute or better service by 2035, versus 24 percent of services today.
- Expansion of ADA paratransit services to keep up with the fast-growing senior population. The MTP/SCS also calls for paratransit vans to be replaced regularly and equipped with technologies that optimize trip planning, as well as use of quality vehicles.
- More replacement buses, running on alternative fuels.
- Strategic expansion of regional and local rail where it can be cost-effective given surrounding housing and employment densities. New local rail expansions include light rail to Cosumnes River College and the Sacramento International Airport and the introduction of streetcars in Rancho Cordova and between downtown Sacramento and West Sacramento.
- Additional service on the existing Capitol Corridor interregional rail line, provided by Caltrans/Amtrak through a Joint Powers Authority.
- Additional service on the existing San Joaquin intercity rail line, operated by Amtrak and funded by Caltrans.
- Operational improvements to improve rail service frequencies.
- Renovation and reconfiguration of the Sacramento Amtrak station (also called the Sacramento Valley Station) as a central intermodal facility for bus and rail connections. Project elements include moving and renovation of the old Southern Pacific depot and building new sidewalks, a parking garage and improved freeway ramps.
- Increased transit security (patrols, lighting, etc.) and trash collection to enhance the attractiveness of transit travel.

Figure 4.1

2035 Transit Network

SACOG 2011



Road, Highway, and Bridge Capital and Operations Investments

Emphasis on cost-effective operational improvements and strategic investments to improve bottlenecks.

The MTP/SCS spends $7.4 billion ($10.5 billion YOE) on road, highway and bridge operational and capacity projects. The budget is notably different from earlier MTPs in its emphasis on operational improvements to improve system productivity over capacity projects. As compared to the 2008 MTP, road capacity investments decline by 30 percent, while the overall decline for this category is 20 percent. Despite the decline in overall roadway investment level, the MTP/SCS improves performance from the previous plan due to a close alignment of projects with the land use pattern supporting the MTP/SCS. Chapter 5A provides a discussion of this land use/transportation connection and its associated impact on performance metrics.

More than two-thirds of the total road and highway investment pays for operational or capacity improvements to existing facilities, while the remainder of the budget includes a mix of new road and highway investments to serve infill and greenfield growth areas. Figure 4.2 depicts the 2035 road and highway network contained in the MTP/SCS.

A shift of MTP/SCS roadway investment priorities from prior plans is reflected in an investment package that focuses on more cost-effective operational improvements and strategic capacity projects. Right-sizing, or value-engineering, of roadway investments for maximum cost-effectiveness is an important component of an MTP/SCS that achieves strong performance benefits with lower funding levels. In addition to increasing the investment in operations, the plan has more limited road widenings than the 2008 MTP. Some examples of streets proposed for widening to six lanes in the 2008 MTP, but which are now proposed for four lanes in the MTP/SCS, include the following corridors:

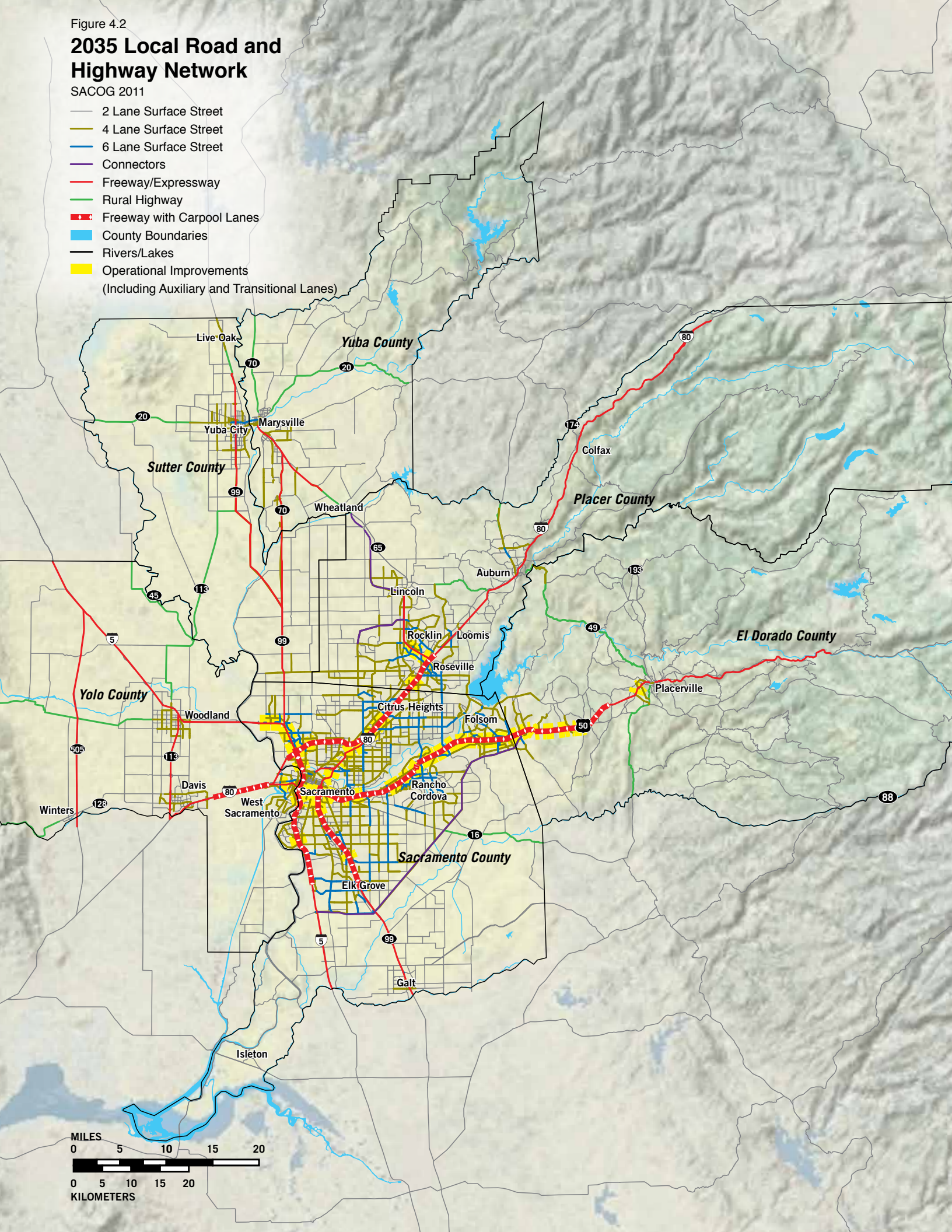
- Baseline Road in Placer County and Riego Road in Sutter County;
- Richards Boulevard and the extension of Cosumnes River Boulevard in the City of Sacramento;
- South Watt Avenue and White Rock Road in Sacramento County;
- Bruceville Road and Bradshaw Road in the City of Elk Grove;
- Sunrise Boulevard south of Kiefer Boulevard in the City of Rancho Cordova; and
- Pleasant Grove Boulevard and the extension of Blue Oaks Boulevard in the City of Roseville.

Many other roadway projects slated for construction in the 2008 MTP are now listed for project analysis only in the MTP/SCS. These projects include: carpool lanes on I-5 from I-80 to the Airport; carpool lanes on SR-99 north of the I-5 interchange; widening of Jackson Highway east of South Watt Avenue; extension of Hazel Avenue south of US-50; extension of Kiefer Boulevard between Bradshaw and Sunrise; and extension of Placer Parkway west of Watt Avenue.

Figure 4.2

2035 Local Road and Highway Network

SACOG 2011



Local Road Investments

Of the $7.4 billion total in this category, the MTP/SCS invests $6.2 billion ($8.8 billion YOE) in local roads to accommodate projected growth. 97 percent of new lane miles in the MTP/SCS are on surface streets, not freeways. The MTP/SCS roadway investments emphasize access to infill development areas, congestion relief, support for bus and rail transit, and improved bicycle and pedestrian access. Local road investments increase capacity for local passenger travel, creating a benefit to goods movement on highways.

Examples of local road investments in the MTP/SCS:

- **Road operational improvements for urban and suburban areas.** The plan includes near-term and longer-term projects, including interchange and intersection bottleneck relief, street improvements to support improved transit access, and investments to support BRT corridors and improve access to transit-oriented developments. The focus areas for these investments are the Center and Corridor and Established Community Types.
- **Road operational improvements for rural and small communities.** Improving roadway safety along farm-to-market routes and corridors along the urban/rural edge is a focus for investments. Operational improvements include closing shoulder gaps, improving rural road intersections, and safer crossings within communities divided by highways or railroads.
- **New and expanded urban arterial roadways to meet community and regional travel needs.** These roadway improvements primarily serve emerging activity centers, including Rancho Cordova, Folsom, West Sacramento and southern Placer County that shoulder a significant share of projected employment and housing growth by the 2035 horizon year. These expansions include complete streets features in order also to support transit and bicycle/pedestrian travel.
- **Connectors,** including the Placer Parkway in southern Placer County and the Capitol Southeast Connector serving Elk Grove, Rancho Cordova and Folsom. The Placer Parkway is a four-lane roadway in a new right-of-way, while the Capitol Southeast Connector in the MTP/SCS is an expansion of existing segments of Kammerer Road, Bruceville Road, Grant Line Road and White Rock Road.
- **Street safety measures,** such as left-turn lanes at intersections, improved lighting and signage, special paving, and median strips, particularly where there are high numbers of automobile or pedestrian accidents. Safety investments are also made at rail grade-crossings and urban interchanges.

State Highway Investments

The MTP/SCS invests $1.2 billion ($1.7 billion YOE) that will primarily be carried out by Caltrans. The investment focus is on operational improvements and strategic new carpool and auxiliary lanes in many interior areas of the freeway system. Collectively, these investments serve travel between activity centers and accommodate trucks for inter-regional goods movement. Fixing bottlenecks along trucking corridors is important, as each truck represents the traffic-generating equivalent of two to four automobiles in stop-and-go traffic.

Added freeway lane miles account for only 3 percent of the total in new roadway capacity. Of this increase in freeway lane miles, over 75 percent are carpool lanes, auxiliary lanes, new ramps or widened ramps. Most of the carpool, auxiliary, and transition lane additions occur in the urbanized part of the region and are directed at closing gaps that relieve congestion along major commute corridors during peak commute periods and to serve suburban job centers where it will take time to build up employment densities to the point that transit becomes a serious option for commuting.

Example state highway projects include:

- **Carpool lanes** between Davis and West Sacramento on I-80/U.S. 50 in Yolo County; as far north as the I-80 interchange on I-5 in Sacramento County; and as far east as Greenstone Road on U.S. 50 in El Dorado County. Some auxiliary lanes are included beyond those limits where they are cost-effective and provide good performance. A complement to these corridor investments is an increase in express bus services between activity centers.
- **Operational improvements for congested or unsafe interchanges,** including freeway-to-freeway interchanges along U.S. 50 and I-80 and at primary freeway-to-arterial corridors, including Watt Avenue and U.S. 50, and Elkhorn Boulevard and Route 99.
- **Guardrails and improved shoulders** along critical sections of freeways and highways.
- **Special paving** (e.g., diamond grooving, reflectors, skid-reducing material) and lighting along specific road segments to improve safety.
- **Incident management investments,** including changeable message signs for traffic alerts and increased freeway service patrols.

Bridge and River Crossing Investments

As a subset of the local road and state highway investments, the MTP/SCS includes over $600 million (over $850 million YOE) in investments for the development of more road, transit, bicycle, and pedestrian capacity on the region's bridges. Three-quarters of this budget pays for major crossings of the American, Sacramento, and Feather Rivers, with the remainder going towards minor capacity expansions on small crossings of creeks and tributaries.

Example bridge projects include:

- **Improved river access across the American and Sacramento Rivers into downtown Sacramento**—New river crossings across the lower American River from Sacramento to South Natomas, and across the Sacramento River from West Sacramento to Sacramento to provide access into downtown Sacramento where there will be a large increase in jobs and residents by 2035.
- **Feather River crossings at Yuba City**—Improvements to the 5th Street and 10th Street bridges, with redesigned approaches and distribution on both ends, to link Yuba City and Marysville more effectively and avoid the high cost of a third bridge.
- **Whitelock Parkway Bridge**—New bicycle and pedestrian crossing of Highway 99 in Elk Grove.
- **One-to-two and two-to-four lane widenings** on a number of small creek crossings.
- **Bicycle and pedestrian retrofits** on existing and new bridges.

Bicycle and Pedestrian Investments

Emphasis on a network of complete streets and corridors between and within the communities in the region

In addition to "complete street" investments described earlier, the MTP/SCS includes $2.8 billion ($4.0 billion YOE) in direct investments for bicycle and pedestrian facilities. This total is within 1 percent of the budget total from the 2008 MTP, but represents a per capita increase of 5 percent.

Types of bicycle and pedestrian projects in the MTP/SCS:

- **Sidewalk network extensions** in neighborhoods, with segments widened where needed.
- **Pedestrian bridges and pedestrian intersection improvements** that include ADA-compatible ramps, bulb-outs and special crossing signals.
- **Bike lanes** on more neighborhood and major streets.
- **Multi-use bike/pedestrian trails** (off-street, grade-separated) that offer residents the opportunity to make utilitarian and leisure trips separated from vehicular traffic.
- **Bike facilities** (racks, lockers, restrooms) at major transit stops/hubs (light rail, BRT, etc.) and at key activity centers (downtown Sacramento, shopping malls, large office complexes, etc.)

Projects reflecting the range of bicycle and pedestrian investments in the MTP/SCS are listed in the *Regional Bicycle, Pedestrian, and Trails Master Plan* (Master Plan). This document is the framework and listing of projects supporting a regional pedestrian and bikeway network. The Master Plan provides a summary of planned bicycle and pedestrian infrastructure projects in each jurisdiction, and among multiple jurisdictions. The goal is to develop a connected system of facilities that provide safe and convenient bicycle and pedestrian travel throughout the region. The development of the regional network is oriented towards utilitarian trips and emphasizes connectivity to current facilities and connections to transit systems and key destinations.

The Regional Master Plan was adopted by the SACOG Board in 2003 and last amended in early 2011. The Master Plan also guides the long-term priorities for the Bicycle and Pedestrian Funding Program (Funding Program). Projects identified in this plan will serve as the main list of projects eligible to receive funding through the Funding Program. The Master Plan and the corresponding Funding Program's emphases are to provide infrastructure for walking and bicycling within and between the cities and towns of the six-county region.

Programs, Planning, and Operations

The plan supports $2.2 billion ($3.1 billion YOE) in funding for supplementary programs, planning, and operational efforts, reflecting a decline of 8 percent from 2008 MTP levels, but maintaining the same per-capita expenditure.

Example programs and planning and operations projects include:

- **Community Design:** Seed funding to encourage smart-growth development projects complementary to this MTP/SCS that may otherwise not happen. The program has been expanded to allow greater regional coverage and support for projects from the planning phase through implementation.
- **Air Quality Improvement Programs:** Funding includes extension of the Sacramento Emergency Clean Air and Transportation (SECAT) grant program for replacing or retrofitting diesel engines and trucks, and Spare the Air programs to reduce vehicle miles traveled on bad air days.
- **Intelligent Transportation Systems (ITS):** Funding reserved for implementation of the regional ITS Strategic Deployment Plan, which includes automated message signs, crosswalk signals with pedestrian countdown timers, real-time transit message signs, and transit signal priority for buses. These investments also include Smart Corridors, including Sunrise and Hazel avenues in Sacramento, where near-term ITS strategies are planned by local agencies, and expansion of Traffic Operations Centers.
- **Travel Demand Management (TDM):** Goals for this funding program include 100 percent of employers served by a Transportation Management Association; a larger rideshare database so that searches average more ride matches; financial incentives for taking alternative modes or telecommuting to work; personalized trip-planning available to the public; expanded promotional campaigns including Bike Commute

Month and the Vanpool Subsidy Program; and demonstration projects (such as car-sharing, instant ride matching, and TDM plans for large development and construction projects).

- **511 Traveler Information:** This existing phone and web-based service will continue to expand as a more highly developed and user-friendly source of detailed travel information. Goals for the future include real-time web-based traffic information, voice interactivity, and a public transit trip planner. The web version will include useful maps for alternative modes (transit system networks, bike routes, etc.). A related project is improved highway advisory radio on weather conditions, road closures, or construction on key highways.
- **Community Enhancements:** Funding for investments, including soundwalls, traffic calming, and streetscaping features, that can make a corridor or intersection more attractive while also improving its safety and operation. Traffic-calming investments include street narrowing, alignment changes, roundabouts, sidewalk bulbouts, refuge islands at intersections, pavement treatments, and angled parking. Streetscape investments include landscaped buffers between streets and sidewalks, landscaped median islands, lighting, signage, and street furniture.
- **Project Development Support:** Funding for projects outside of the planning period of the MTP/SCS to begin early stages of development, including project design, preliminary engineering, environmental clearance, and right-of-way acquisition. Due to limited revenues in the financially constrained MTP/SCS, these projects are not anticipated to have sufficient funding to complete construction during the planning period. This category also includes funding for detailed studies on a wide range of subjects including rail transit opportunities, a regional open space strategy, complete streets design guidelines, and implementation of the Rural-Urban Connections Strategy.

Paying for the MTP/SCS

Funding to support the transportation investments in the MTP/SCS comes from a number of federal, state, and local sources, each with specific purposes and restrictions. In total, SACOG forecasts $35.2 billion in revenues ($49.8 billion escalated) over the planning period. On average, this comes out to $1.4 billion ($2.0 billion escalated) per year over 25 years. Compared to the 2008 MTP, the revenues supporting this MTP/SCS reflect a roughly 13 percent reduction in total budget. Even after the region recovers from the recent recession, SACOG projects the population of the region will grow more slowly over the next 25 years, resulting in nearly 300,000 fewer people by 2035 than previously estimated. This smaller population results in a decrease in revenues on a per capita basis of only 5 percent.

Federal and state laws require that the MTP/SCS must constrain its budget by assuming only revenues that can reasonably be expected over the next 25 years. Therefore, the revenue assumptions contained in this plan assume that current sources of revenue in the region will continue into the future at rates of growth consistent with historical trends and projected future economic conditions.

The following section provides a summary of MTP/SCS revenues by federal, state, and local sources. Appendix B-1 provides a more detailed description of SACOG's budget, revenue and investment assumptions.

Federal Revenues

Federal revenues in the MTP/SCS total $3.8 billion ($5.4 billion escalated), or 11 percent of the total budget. Federal programs typically support one-time capital investments over ongoing investments for road maintenance and transit operations. However, some federal funds are available to support major road rehabilitation projects such as reconstruction and replacement of decaying bridges, as well as transit preventative maintenance aimed at extending the life of transit facilities or vehicles. Federal funding sources come in the form of Congestion, Mitigation, and Air Quality Program (CMAQ), Regional Surface Transportation Program (RSTP), and Federal Transit Administration Chapter 53 funds, and a few other smaller federal discretionary programs.

State Revenues

State funds in the MTP/SCS total $8.7 billion ($12.2 billion escalated), or 25 percent of the total budget. California Department of Transportation (Caltrans) maintenance and capital investments for the state highway system and intercity rail services operated within the region comprise 75 percent of the state revenues in the MTP/SCS. State assistance for local projects is similar to federal programs in its support of one-time capital investments. One notable

exception is State Transit Assistance (STA), which can be used to support local transit operations. However, in the region, STA typically makes up less than 10 percent of annual transit operating budgets.

Local Revenues

Local funds in the MTP/SCS total $22.7 billion ($32.2 billion escalated), or 64 percent of the total budget. Local revenues are the primary financial support for the basic maintenance and operation of the region's road and transit system (over 95 percent of local road maintenance and rehabilitation and over 75 percent of transit operations). The principal sources of local revenues are sales and fuel taxes, developer fees and contributions, local general funds, and transit fares. On average, local revenues also cover 65 to 90 percent of major capital improvements on local road systems and frequently pay for 100 percent of relatively minor improvements.

Implementing the MTP/SCS Transportation Projects: From Planning to Programming

Implementation of a long-range MTP is carried out gradually through shorter-term decisions that assign state or federal funds to specific projects through periodic funding or programming cycles. By adopting the MTP, the region will achieve consensus on transportation system needs over the next 25 years, and also set the stage for the short-term strategy to implement the MTP.

The MTP describes general priorities by the years in which individual projects are scheduled to occur, although in the case of larger, more complex projects, the time it takes to get a project ready may stretch out its schedule beyond where its real priority would warrant. The MTP must spread projects through all of its 25 years to match the flow of revenues. Because many local agencies want to build most of their projects within the next 10 years or so, the scheduling of projects to match availability of revenues tells them that they cannot realistically expect to build all those projects at once, and forces SACOG and local agencies to collaborate to arrange projects in a priority and schedule order. The schedule for the draft project list was completed to meet the following objectives:

- Balance revenues and expenditures over the 25-year planning period—Projects must be scheduled to match the pace at which revenues are available to pay for them, proportionally over 25 years, which limits the number of projects that can be planned for any given year and forces decisions about relative priority. This test is called financial constraint.
- Support attainment of air quality standards—The MTP must be analyzed as an overall package via a computer model to verify that its implementation would meet federal air quality requirements in the region's Rate of Progress State Implementation Plan, and the sequence in which projects are scheduled could make a difference in that analysis. This test is called air quality conformity.

As Caltrans, cities, counties, or other local agencies implement projects contained in the MTP, if they want to be eligible to use federal or state funding for a project, either received directly or via the region, the project must be consistent with the MTP. SACOG amends its MTP from time to time, and, when it does, it must verify both financial constraint and air quality conformity.

Federal and state laws designate certain funds as regional, and the regional agency decides how those funds are used. Otherwise, most projects are funded by local agencies using local funds. SACOG acts as the regional transportation planning agency (RTPA) under state law for four counties (Sacramento, Sutter, Yolo and Yuba), and as the metropolitan planning organization (MPO) under federal law for all six counties in the region (including Placer and El Dorado). Under federal and state law, SACOG receives apportionments of two kinds of federal funds annually—Congestion Mitigation and Air Quality (CMAQ) and Regional Surface Transportation Program (RSTP)—currently amounting to about $40 million per year. Under state law, SACOG receives a share of funds through the State Transportation Improvement Program (STIP) every two years, currently amounting to about $20 million per year. These STIP funds are consistent with the four-year fund estimate and comprised of both state and federal fund sources. These funds are included in the MTP.

SACOG indicates in the MTP the types of projects on which it intends to spend regional funds during the 25 years of the plan. While the MTP identifies a long list of specific projects, the MTP does not specify which funds will be used to build which projects. Selecting projects for funding is done through a separate process known as programming. SACOG typically programs projects every two years; programming for federal and state funding in El Dorado and Placer counties is managed separately through the RTPAs in each respective county.

Cities, counties, transit operators, other local agencies and Caltrans carry out the MTP by using available resources to implement the projects designated in the MTP. In programming, SACOG assigns its regional funds in specified amounts to specific projects, shown in a document which SACOG calls the Metropolitan Transportation Improvement Program (MTIP), which officially becomes this region's part of a broader statewide document called the Federal Statewide Transportation Improvement Program (FSTIP). When an agency seeks an allocation of federal funds to spend on a project, or needs a federal permit to continue project work, federal and state agencies check to see that the project and funding are shown in the MTIP/FSTIP. Besides being a programming document, the MTIP serves as a current snapshot of the progress and schedule for implementing projects, and lays out the commitments of funding that the agencies will need to complete those projects in a manner that is consistent with the MTP.

The MTIP is a four-year document under present law. The current MTIP covers the federal fiscal years 2011–2014 and expires in November 2014; a new one must be adopted every two years, so the next MTIP is due in mid-2012. SACOG also amends its MTIP periodically, usually because of a change in project cost, funding, or schedule, but also occasionally to redefine the scope of a project.

The MTP and MTIP are linked in two ways. First, any project to be programmed in the MTIP must be consistent with the MTP. Second, although SACOG does not have to program projects exactly according to the timing and cost laid out in the MTP, once it does program projects from the MTP into the MTIP, the MTIP supersedes the MTP; in essence, the MTIP becomes the first four years of the plan.

A new MTIP or amendment to the MTIP will often have to be accompanied by an amendment to the MTP to keep them consistent.

The MTP and the MTIP thus form a two-step plan and implementation process. Because of federal and state laws and regulations, the process to keep the MTIP and MTP current and consistent is not simple. SACOG must provide for public review of amendments, as specified in its Public Participation Plan. SACOG must verify financial constraint. For the MTP, the total cost of projects and activities cannot exceed an estimate of funds reasonably expected to be available going out to 2035, determined according to various assumptions described in the plan about funding in the future. For the MTIP, the test is much tighter: funds must be available from existing sources, and the MTIP assigns those funds to specific projects and types of work. Finally, SACOG must verify air quality conformity, which, in effect, shows that projects in the MTIP and MTP produce air pollution emissions no greater than allowed by emissions budgets specified in the region's air quality plan (SIP).

The responsibility to complete environmental studies, design, construct and operate projects falls to local agencies and to Caltrans. For some projects, local agencies seek federal or state funds through SACOG, and if SACOG programs funds to a project it must be amended into the MTIP, and from then forward its project listing in the MTIP must be kept current. The implementing agency sometimes changes a project during this delivery process, and as engineering work progresses the agency can make more precise cost estimates. These may lead to a need to amend the MTIP (and perhaps the MTP as well) if the agency is relying on federal or state funds to finish the project. As each phase of work becomes ready to proceed, the implementing agency asks SACOG and Caltrans to allocate the amount of federal funds programmed in the MTIP for that phase: if state funds are involved, the California Transportation Commission must also approve the allocation. At this point, if all requirements have been met and all information is shown correctly, the allocation becomes a quick ministerial action, and the agency can then use the funds to reimburse itself as it pays the bills for project work.

Chapter 5A

Transportation Trends & Performance

Overview of Performance and the Land Use-Transportation Connection

Introduction

Because the MTP/SCS is a long-range plan, the degree to which it enhances the performance of the region's transportation system and improves mobility and access for residents of the region over time are key measures of success. This is especially important to ensure more efficient vehicle and freight movement, and improve mobility options for cost, health, environmental, or other reasons.

This chapter is divided into three sections to fully describe the performance of the transportation system planned for in this MTP/SCS: Chapter 5A provides an overview of the land use-transportation connection; Chapter 5B describes the performance of the roadways in terms of vehicle miles traveled and roadway congestion and delay; and Chapter 5C discusses transit and non-motorized travel (i.e., bicycling and walking).

Chapter 5A provides background for Chapters 5B and 5C and is divided into three sections. The first section describes the indicators critical to evaluating performance of the transportation system and how the MTP/SCS performs on them (Overview of Transportation Performance Indicators); the second section describes the analytical framework and modeling tools used to measure these indicators (Technical Analysis Framework and Tools); and the third section describes the primary relationships between land use and transportation that influence these indicators (Land Use-Transportation Connection).

Transportation performance indicators—the basic relationships between land use, the transportation system, and travel outcomes—have been a focus of the entire MTP/SCS process. Technical work and public outreach have spotlighted tradeoffs in investment options and have strived to balance growth and conservation. The three alternative scenarios presented at the MTP/SCS workshops in the fall of 2010 included data characterizing the land use and transportation inputs, and the travel outcomes that could be expected from each of those scenarios. The development of the MTP/SCS described in this plan drew from various elements of each of the three scenarios. Chapter 2 provides a description and Appendix G-1—Public Workshop Scenarios and Workshop Results provides more detail on the development of these scenarios.

Transportation plans often focus on improving mobility through investment in transportation infrastructure and services. Measures of mobility, such as the percent of travel using a particular travel mode or mode share, travel time, and travel delay provide valuable information about how well current and planned transportation systems function. Through the course of the entire MTP/SCS planning process and SACOG's ongoing Congestion Management Process (CMP), the performance focus has been on the following critical indicators:

- vehicle miles traveled (VMT) on the region's roadways;
- the level of congestion and delay for all modes, but especially roadway congestion;
- transit ridership and the share of trips made by transit modes; and
- travel by non-motorized travel modes (bike and walk) and the share of trips made by those modes.

In part, the focus on these indicators began with the adoption of the Metropolitan Transportation Plan (MTP) for 2025 in July 2002, and continued through the update of the last MTP in 2008. The 2008 MTP was the first comprehensive update of the long-range transportation plan after the adoption of the Blueprint vision in 2005, and the first in the Sacramento region based firmly on the Blueprint's smart growth planning principles. One over-arching performance result of the 2008 MTP was the reversal or amelioration of several persistent and worrisome historic trends:

- VMT growth continuing to outstrip population growth—the 2008 MTP promised a reversal of this trend, with VMT per household declining by 6 percent or more.
- Roadway congestion growth far in excess of growth in VMT—the 2008 MTP promised a significant reduction in the growth rate of congestion in the region, but congestion was still expected to exceed population growth for the foreseeable future.
- Transit ridership increases, but not by much—the 2008 MTP promised a tripling of transit trips, and 35 percent increase in the productivity of transit services.
- Declining non-motorized mode share—the 2008 MTP promised a reversal of this trend, with non-motorized trips per capita increasing by 26 percent or more.

This chapter picks up this story where the 2008 MTP left off. The main performance questions addressed by the MTP/SCS are:

- A lot has changed in the region (as well as in California, the nation, and the world) since the adoption of the last MTP in 2008. To what extent does this MTP/SCS account for and address changes in the economy, changes in regulations and planning requirements, and changing expectations and priorities for SACOG member agencies and residents of the region?
- To what extent can the MTP/SCS improve on the transportation performance promised in the 2008 MTP? The MTP/SCS planning effort focused more attention on the land use-transportation connection than the 2008 MTP, and required a much higher level of effort on the part of all SACOG's member agencies and planning partners to maximize the connection between the land use pattern and the multi-modal transportation system.
  - For roadways, the MTP/SCS emphasis is placed on addressing existing bottlenecks and congestion points in the freeway system, and in right-sizing surface street improvements on the arterial street system.

  - For transit, the MTP/SCS emphasis is on concentrating the most frequent, highest-capacity transit services in corridors with the greatest ridership potential, and limiting expansion of transit service in areas where land use patterns would not support frequent, high-capacity transit.
  - For bicycling, the MTP/SCS emphasis is on expanding the network of Class 1 separated bike paths and Class 2 bike lanes and providing alternate, attractive bike routes in corridors where existing routes are non-existent or extremely unattractive to use.
  - For walking, the MTP/SCS emphasis is on supporting compact land uses, with a good mix of complementary land uses and a street pattern supportive of walking. In combination, these strategies provide the opportunity to make shorter trips, and make a higher share of trips by walking.

Highlights of the performance of the MTP/SCS are:

- Decline in VMT per capita—Expected VMT from all sources in the region decline by 6.9 percent from 2008 levels. (This compares to a 1.8 percent reduction for the 2008 MTP). The VMT generated by passenger vehicles, a subset of all VMT, is forecasted to decline by 8.8 percent from 2008 (compared to a 5.2 reduction in per capita VMT for the 2008 MTP, and an 8 percent increase in per capita VMT for the 2002 MTP).
- Decline in congested VMT per capita—For the first time, the long range transportation plan for the SACOG region is forecasted to result in a decline of 7 percent in the amount of congested vehicle travel per capita. This is the first long range transportation plan which is forecasted to result in a decline in this metric. (This compares to a 22 percent increase in the 2008 MTP, and a 58 percent increase in the 2002 MTP).
- Increase in travel by transit, bicycle and walking—The MTP/SCS is forecasted to increase trips per capita by transit, bicycle or walk by 32.8 percent. (This compares to an 8.1 percent increase for the 2008 MTP).
- Increase in Productivity of the Transportation System—The MTP/SCS roadway system will be more efficiently used, with the proportion of VMT in the optimal use range increasing. The MTP/SCS is also forecasted to more than double the productivity of the region's transit system, from about 33 boardings per service hour to over 70. This improvement in transit productivity will substantially increase the amount of service which can be funded through passenger fares.

Technical Analysis Framework and Tools

In evaluating the performance of the MTP/SCS and the ongoing CMP efforts, two points of reference are used for each key indicator:

- What have the historic trends been for each indicator? How do the projections for the MTP/SCS affect the historic trends? For each key indicator, the best historic trend data are presented, along with future projections for the MTP/SCS.
- How does the MTP/SCS, taken as the combined effects of a more efficient and compact allocation of growth, and the proposed package of transportation investments to 2035, compare to what would have unfolded using the prior growth projections and the 2008 MTP?

Forecasting and Analysis Tools

The main tools used for the transportation analysis of the MTP/SCS are SACOG's land use scenario software and databases, and regional travel demand model. SACOG has been at the forefront of development and application of travel demand modeling tools, and throughout the Blueprint project SACOG undertook research and analysis activities to evaluate and improve the ability to capture land use-transportation interrelationships using computer models.

SACOG utilized its regional travel demand model to compare the MTP/SCS 2035 conditions to the existing conditions for the 2008 base year. SACOG's primary model is the Sacramento Regional Activity-Based Simulation Model (SACSIM). SACOG periodically updates and improves SACSIM, and releases versions of the model and data for use by member agencies when the MTP is adopted, with versions numbered according to the year the version was finalized. SACSIM07 was used for the 2008 update of the MTP. SACSIM11 was used for the analysis of this MTP/SCS.

SACSIM includes four sub-models for predicting travel demand. The major sub-model is DAYSIM, which is an activity-based tour sub-model for predicting household-generated travel. DAYSIM is an advanced practice[1] demand micro-simulation, which represents travel activities as tours, or series of trips, connecting the activities a person engages in during the course of a normal day. DAYSIM allows for much more detailed representation of key factors influencing household-generated travel, such as detailed characteristics of land use in the region, age of residents, household income, cost of fuel, and other factors.

SACSIM also includes a more conventional, state-of-

[1] Advanced practice travel demand modeling is defined in TRB Special Report 288, "Metropolitan Travel Forecasting: Current Practice and Future Direction".

practice[2] sub-model for predicting commercial vehicle travel. Two classes of commercial vehicles are modeled: two-axle commercial vehicles, and three-plus-axle commercial vehicles. Two-axle commercial vehicles include a wide range of vehicles, from a passenger vehicle which might be used to transport a computer repair person and their tools and equipment to an office to perform a repair, to a relatively small truck delivering produce to a restaurant or store. Three-plus-axle commercial vehicles also include a wide array of vehicles, from medium-sized delivery trucks to large, 5-axle tractor-trailer combinations. The common element tying these vehicles together is that they are used to transport goods and services, and are not used for personal (household-generated) travel.

SACSIM also includes sub-models for predicting air passenger ground access to the Sacramento International Airport, and for predicting external travel, including travel by residents of the region to locations outside the region, residents outside the region traveling to locations within the region, and travel which goes through the region, but does not stop within the region.

Travel demand for vehicle or passenger trips estimated using SACSIM are combined for assignment to detailed computer representations of the region's highway and transit networks using software and programs. The resulting assignments are used for evaluation of VMT on roadways, and evaluation of congested travel.

The analysis period of SACSIM is a typical weekday. A typical weekday is intended to represent weekday conditions during a non-summer month (i.e., a time period when most workers are at work, rather than on vacation, and when schools are normally in session). Where annual or other time periods are required, typical weekday estimates of travel are scaled up to represent those time periods. Within the typical weekday are four demand periods: A.M. peak period (7:00–10:00 a.m.); midday period (10:00 a.m.–3:00 p.m.); P.M. peak period (3:00–6:00 p.m.); and the late evening/overnight period (6:00 p.m.–7:00 a.m.).

Demographics

Demographics are a key factor influencing travel behavior. As mentioned above, SACSIM relies on a more detailed representative population file for its micro-simulation of travel demand. The representative population files are prepared using open source PopGen software, developed by Arizona State University. The 2005-2009 sample American Community Survey data by Census tract were used to control and validate the 2008 base year representative population file. Control variables at tract level included: number of persons per household; number of workers per household; household income; age of householder; and age of person within household. For 2035, the 2008 demographic controls were adjusted to reflect changes to population, household size, age of householder, and household income, which were forecasted by the Center for Continuing Study of the California Economy, and approved for use in the development of this plan by the SACOG Board in April 2010. Forecasts projected:

- Household population in the SACOG region increasing by 305,000 from 2008 to 2020, and 871,000 to 2035;
- The percentage of persons 65-year-and-older increasing from 13 percent in 2008 to 18 percent by 2020, and 22 percent by 2035; and
- Average household incomes rising by about 10 percent across the region by 2035, compared to 2008.

The Center for Continuing Study of the California Economy forecast is described in greater detail in Chapter 3.

Costs of Travel

Another key factor influencing travel behavior is the relative cost of different forms of travel. The time period from 2005 to the present has seen unprecedented volatility in fuel prices, reaching a historic high in September 2008. Recent releases of long range projections of fuel prices by the U.S. Department of Energy[3] and the California Energy Commission[4] have both responded to the volatility of fuel prices and changes to the global market for energy by showing scenarios with much higher high prices than in earlier releases of these reports.

As part of its work to implement technical aspects of SB 375, SACOG with other state MPOs worked to develop consistent consensus future projections of fuel prices for use in each respective region's implementation of SB 375 greenhouse gas reduction targets. Prior to this coordination effort, each MPO made its own projection. SACOG used this consensus future projection in the preparation of the

[2] Ibid.

[3] Department of Energy, "Energy Outlook" series provides forecasts and projections of prices for gasoline and diesel.

[4] California Energy Commission "Integrated Energy Policy Reports" series provides forecasts and projections of prices for gasoline and diesel.

MTP/SCS: for 2020, fuel prices were assumed to increase to $4.74, and by 2035 to $5.24 (both stated in 2009 dollars). Part of the same MPO technical coordination effort resulted in a consensus for projecting the most likely passenger vehicle fleet fuel efficiency to use for SB 375 implementation, based in part on changes to vehicles required by California's Pavley rule, authorized by AB 1493 in 2002. For SACOG, 2020 passenger vehicle fleet efficiency was assumed to be 25.5 miles per gallon (mpg), increasing to 29.3 mpg by 2035 (compared to 20.6 mpg in 2008). The combination of the fuel prices and fleet fuel efficiency, along with estimates of the costs of maintenance and other operating costs (but not insurance or depreciation), resulted in projected auto operating costs of $0.27 per mile by 2020 and $0.29 by 2035 (compared to about $0.19 in 2008).

Land Use-Transportation Connection

The Sacramento region's Blueprint, completed in 2004, relied on a growing body of research on the land use/transportation connection. The Blueprint relied on the latest research at that time to forecast the effects on travel outcomes (i.e., VMT, transit mode share, congestion, and non-motorized mode share) based on changes to future land use patterns. Since that time, the body of research and knowledge on the land use-transportation connection has expanded and matured. The latest research results were published in a 2010 meta-analysis (i.e., a rigorous review and compilation of studies) by Robert Cervero and Reid Ewing in the Journal of the American Planning Association.[5] The meta-analysis examined the following land use/transportation factors:

- Regional Accessibility is a way of quantifying how connected a given area is to the existing development, and is usually stated as the number of jobs within an average auto commute time. It is a measure of how many activities are within a reasonable drive time from a place of residence. In areas within the existing urbanized area, regional accessibility is usually higher, and in outlying areas or areas on the urban edge, it tends to be lower. This factor has the strongest potential effect on VMT—a 10 percent increase would result in a 2 percent decline in VMT for residents of an area.
- Street Pattern/Urban Design refers to how walkable a given area is, based on characteristics of the street pattern in that area. It is usually measured as the density of intersections in a given area. The greater the number of intersections, the smaller the blocks and the more potential walking connections there are in that area. Although other factors affect walkability and walk mode share, (e.g., presence/absence of sidewalks, pedestrian amenities on the street, traffic volumes on streets, presence/absence of crosswalks, treatment of pedestrians at signalized intersections.) street pattern has been used in research as a proxy for walkability, in part because it is relatively easy to assemble data. In terms of VMT reduction, street pattern is the second strongest factor.
- Mix of Use refers to the inclusion in an area of a range of complementary land uses, which allows for more activities (i.e., working, shopping, school) to be contained within that area. Good land use mix allows for reductions in VMT through shortening of vehicle trips or shifting to other non-vehicle modes of travel such as walking. The most common measures of mix of use combine the relative proportions of residential, overall jobs, retail and other residential-supporting land uses into an entropy formula, which translates the balance of land use mix into a 0 to 100 scale.
- Proximity to Transit refers to the distance from a residence to the nearest transit station or stop, with VMT declining, and both walking and transit use increasing, as distance to the nearest transit gets shorter.
- Residential Density refers to the number of persons or dwellings clustered into a given area. Conceptually, density is quite easy to understand—the number of persons or housing units located in a given area. However, because there are different definitions of area (e.g., net acreage, gross acreage, total area) the effects of density are often over- or under-stated. The Ewing and Cervero meta-analysis controlled for differences in definition of density across the studies they reviewed.

Table 5A.1 provides a summary of the results of the Ewing/Cervera meta-analysis of land use/transportation factors and travel outcomes. The table provides the elasticity of the travel outcomes for each land use/transportation factor, which is the percentage change in the outcome for each 1 percent increase in the factor. So, an elasticity of -0.2 means a change of -0.2 percent in the outcome, for a 1 percent increase in the factor.

[5] Ewing, R. and Cervero, R., "Travel and the Built Environment: A Meta-Analysis", *Journal of the American Planning Association*, Vol. 76, No. 3, Summer 2010.

Table 5A.1
Land Use/Transportation Factors and Travel Outcomes

	Travel Outcome		
Land Use /Transportation Factor	**VMT**	**Walk**	**Transit**
Elasticity (Change in Travel, with respect to 1% increase in Factor)[1]			
Regional Accessibility	-0.20	+0.15	n/a
Street Pattern/Urban Design	-0.12	+0.39	+0.23
Mix of Use	-0.09	+0.15	+0.12
Proximity to Transit	-0.05	+0.15	+0.29
Residential Density	-0.04	+0.07	+0.07
Change in Travel Outcome, with 10% Increase in Factor			
Regional Accessibility	-2.0%	+1.5%	n/a
Street Pattern/Urban Design	-1.2%	+3.9%	+2.3%
Mix of Use	-0.9%	+1.5%	+1.2%
Proximity to Transit	-0.5%	+1.5%	+2.9%
Density	-0.4%	+0.7%	+0.7%

[1] Ewing, R. and Cervero, R., "Travel and the Built Environment: A Meta-Analysis," Journal of the American Planning Association, Vol. 76, No. 3, Summer 2010.

Source: SACOG, September 2011.

Although it is tempting to assume that the relationships shown in Table 5A.1 are discrete dials that can be adjusted to achieve pre-defined results, there are many factors that confound attempts to isolate individual effects. Self-selection bias is a major confounding factor, which is poorly accounted for in most of the research. Self-selection bias refers to the fact that personal preference affects where someone chooses to live and the travel choices they make. Individuals who like walking may gravitate to walkable environments in their place of residence or place of work, and some of the land use-transportation relationships which are shown in research based on travel surveys may simply be measuring these preferences. Replicating in new areas the high walk share observed in existing well-mixed, walkable neighborhoods may not be possible, simply because the existing areas may have attracted a unique population of individuals who prefer walking.

Further, interactions among the land use-transportation factors themselves are very difficult to control, and many factors are highly correlated. For example, many areas with good street patterns (i.e., higher intersection densities) are also more dense, simply because block and lot sizes are smaller. Research has also recognized that the combined effects of many factors is not always equal to adding up the individual effects of each factor—there may be ceilings on some of the combined results. On the other side, some of the combined effects may be greater than the sum of the individual effects. For example, evidence from transit-oriented developments suggests that the combined effects of density, proximity to transit, and street pattern around rail stations with frequent service may far exceed the reductions in VMT and increases in walking and transit travel suggested by Table 5A.1.[6] Although some factors are known to have greater potential influence (e.g., regional accessibility on VMT), making significant changes to those factors may actually be difficult.

[6] TCRP 128, "Effects of TOD on Housing, Parking, and Travel." Transportation Research Board, 2008.

Land Use-Transportation in the MTP/SCS

Table 5A.2 provides a summary of key land use-transportation factors in the region, comparing the 2035 changes from the MTP/SCS to 2008. The factors are tabulated by Community Type (see Chapter 3 for a more detailed description of the Community Types).

- Regional accessibility increases by 31.3 percent overall, with all Community Types increasing by 29 percent or more, relative to 2008. Center and Corridor Communities have the highest level of regional accessibility in both 2008 and 2035 in the MTP/SCS—in both years, accessibility to jobs is nearly 50 percent higher for residents of these areas, compared to the regional average. Accessibility to jobs declines for the remaining area types, with residents of Rural Residential and Lands Not Identified for Development in the MTP/SCS having the lowest accessibility in both 2008 and 2035 at 60 percent or more below regional averages. This reflects the fact that Center and Corridor Communities are centrally located in the region, and in general are surrounded by urban development. Developing, Rural Residential, and Lands Not Identified for Development in the MTP/SCS are located on the urban edge, or completely outside the urbanized area. Developing Communities, to the extent they are at the edge of the urbanized area, have access to jobs on only one side. These locational factors drive down regional accessibility, and, by extension, drive up VMT generation.
- Street pattern follows a similar pattern as regional accessibility, with Center and Corridor Communities being the highest in both 2008 and 2035 in the MTP/SCS. Center and Corridor Communities are more likely to be in older developed areas of the region, with smaller-block, grid-patterned street networks. These older street patterns are, all other things being equal, considered to be more walkable than more curvilinear, cul-de-sac dominated street patterns in more recently developed areas.
- Mix of use is highest in Center and Corridor and Established Communities, largely because these areas are located near jobs and commercial centers. In 2008, Developing, Rural Residential, and Lands Not Identified for Development in the MTP/SCS were very low in measured mix of land use, with all below 14 of 100 on the SACOG mix index[7]. In general, measured land use mix is low in these areas, because they are predominantly residential, with very little commercial, school or other supportive non-residential uses within one-half mile of places of residence. The biggest change in mix of use between 2008 and 2035 in the MTP/SCS occurs in Developing Communities—this change is reflective of a significant amount of growth and consideration of land use mix in the planning for these areas.
- Proximity to transit, as expected, is greatest in Center and Corridor Communities, with distance to the nearest transit station or stop averaging less than one-quarter mile in 2008, and declining to about one-eighth mile by 2035 based on the MTP/SCS. Overall proximity to transit also improves, declining from 0.72 miles in 2008 to 0.55 miles by 2035.
- Residential density increases overall by 27 percent, but the changes are focused on two Community Types: Center and Corridor Communities, which increase from about 10 dwellings per residential acre to about 15 units; and Developing Communities, which increase from 1.3 dwellings per acre to about 4.5 units. The other Community Types changed by less than 10 percent.

[7] SACOG's mix index measures the degree to which the regional balance in total jobs per household, retail jobs per household, service jobs per household, and K12 school enrollment (i.e. school capacity) is provided within a one-half mile radius of the place of residence.

Table 5A.2

Land Use / Transportation Factors and the MTP/SCS

Land Use / Transportation Factor[1]	Community Type: Centers / Corridors	Established	Developing	Rural Residential	Region
2008					
Regional Accessibility[2]	561,970	391,325	254,496	132,585	379,598
Street Pattern/Urban Design[3]	115	87	64	17	83
Mix of Use[4]	37	33	14	10	31
Distance to Transit[5]	0.21	0.55	1.22	2.91	0.72
Residential Density[6]	10.1	3.8	1.3	0.2	1.5
2035 MTP/SCS					
Regional Accessibility[2]	729,235	515,642	351,964	196,759	498,359
Street Pattern/Urban Design[3]	111	90	67	20	86
Mix of Use[4]	38	35	28	11	33
Distance to Transit[5]	0.12	0.42	0.7	2.65	0.55
Residential Density[6]	15.0	4.1	4.5	0.2	1.9
Change from 2008					
Regional Accessibility[2]	+29.8%	+31.8%	+38.3%	+48.4%	+31.3%
Street Pattern/Urban Design[3]	-3.5%	+3.4%	+4.7%	+17.6%	+3.6%
Mix of Use[4]	+2.7%	+6.1%	+100.0%	+10.0%	+6.5%
Distance to Transit[5]	-42.9%	-23.6%	-42.6%	-8.9%	-23.6%
Residential Density[6]	+48.5%	+5.7%	+240.5%	+6.0%	+27.1%

1 All numbers are population-weighted averages for residences in each community type.

2 Total jobs within 30-minute drive from place of residence.

3 Intersection density, stated as intersections per square mile, within 1/2-mile of place of residence.

4 SACOG mix of use index, 0 to 100 scale with 0 = homogenous, 100 = perfect mix of use.

5 Shown as average distance from place of residence to nearest transit station or stop, in miles.

6 Dwelling units per net residential acre, within ½-mile of place of residence.

Source: SACOG, September 2011.

Chapter 5B

Trends & Performance

Vehicle Miles Traveled (VMT) & Roadway Congestion

Building on the performance overview in Chapter 5A, this chapter describes the performance of the MTP/SCS transportation system in terms of two key roadway system indicators: vehicle miles traveled and roadway congestion.

Vehicle Miles Traveled (VMT)

This section discusses why SACOG measures and monitors VMT, defines the various types of VMT that are modeled and analyzed for the MTP/SCS, reports observed trends in VMT in the region, reports the VMT performance of the MTP/SCS, and explains the VMT performance of the MTP/SCS.

Why We Measure VMT

A vehicle mile traveled, or VMT, is literally one vehicle traveling on a roadway for one mile. Regardless of how many people are traveling in the vehicle, each vehicle traveling on a roadway within the Sacramento region generates one VMT for each mile it travels. For this section and most of SACOG's technical analysis, VMT is estimated and projected for a typical weekday, as defined in Chapter 5A.

VMT is and has been a primary indicator of travel for policymakers and transportation professionals for decades. The prevalence of this measure is due to several factors:

First, it is relatively easy to measure by counting traffic on roadways at different locations. It is one of the few measures of transportation performance that has been consistently and comprehensively monitored and documented over time in the region.

Second, VMT bears a direct relationship to vehicle emissions, although the relationship is complex moving into the future. State[1] and federal[2] policies pertaining to vehicle efficiency and formulation of vehicle fuels suggest that on a per VMT basis, emissions for most pollutants will decline relative to today. However, even with these per VMT improvements due to fuel and vehicle technology changes, lower VMT will mean lower emissions. Looked at another way, lowering VMT is a way to expand the reductions expected from fuel and vehicle technology improvements.

Third, VMT can be influenced by policy in a number of different ways. By providing more attractive alternatives to driving alone, VMT can be reduced by shifting from vehicle to non-vehicle modes (i.e., from a car trip to a bike or walk trip), or from low occupancy to higher occupancy vehicles (i.e., from a single-occupant vehicle trip to a carpool or transit trip). VMT can be influenced by land use patterns as well. A better mix of residential, employment, education, and service uses in an area can allow people to accomplish their daily activities with less driving, and consequently, less VMT.

Fourth, VMT correlates with congestion. The more miles people are driving their vehicles, the more vehicles there are on the roadways at any given time. Higher numbers of vehicles eventually result in congestion.

Finally, VMT correlates with frequency of traffic accidents. Although facility design and traveler behavior affect the frequency and severity of accidents, a major factor in determining the number of accidents that occur is the amount of travel. Safety analysts and researchers usually normalize the number of accidents with VMT in order to track and understand accident trends.

Definitions of VMT Reported

Although the basic definition of VMT is one vehicle traveling on a roadway for one mile, VMT is reported here in two different ways: total VMT and VMT attributed to source: household-generated, commercial vehicle, or external.

Total VMT is all VMT for all types of vehicles totaled together. In this report, total VMT is reported by the geography in which it occurs, based on the locations of the roadways being analyzed. So, for example, total VMT reported for Sacramento County includes all VMT on roadways within Sacramento County, even though some VMT that occurs on Sacramento County roadways is generated by travelers residing outside Sacramento County, and vice versa.

VMT attributed to source splits VMT into one of three categories: household-generated, commercial vehicle, and external.

- Household-generated VMT includes VMT generated by residents of the region, for their travel within the region. Household-generated VMT includes vehicle travel for normal commuting, going to school, shopping, and personal business. Household-generated VMT usually includes about three-quarters of total VMT.
- Commercial vehicle VMT includes VMT generated by commercial vehicles moving goods or services within the region. Commercial vehicle VMT is usually about one-sixth of total VMT.
- External VMT includes VMT generated by passenger vehicles traveling through the region. It also includes travel within the region from residents of areas outside the region. Through-trips by commercial vehicles are tallied with commercial vehicle VMT described above. External VMT usually includes slightly less than one-tenth of total VMT.

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[1] AB 1493 (Pavley rule) vehicle efficiency standards, and low-carbon-fuel standards (Executive Order S-01–07), implemented as part of California's Global Warming Solutions Act (AB 32)

[2] National Highway Transportation Safety Administration Corporate Average Fuel Efficiency (CAFE) vehicle efficiency standards http://www.nhtsa.gov/cars/rules/cafe/overview.htm

Observed Data and Recent Trends in VMT

Observed VMT is collected by Caltrans as part of the Highway Performance Monitoring System (HPMS). HPMS data are based on a sampling approach, in which a sample of roadways of different types (e.g., freeway, rural highway, principal arterial) are counted, and statistically expanded to estimate total VMT in different areas within the state. Table 5B.1 provides a county-by-county tabulation of VMT within the region for 2000 through 2008.

- During the period 2000 to 2005, total daily VMT in the region grew at about 2 percent per year. From 2005 to 2008, total daily VMT actually decreased slightly, reflecting the slowing of the region's economy, increasing unemployment, higher fuel prices, and other factors.
- During the period 2000 to 2005, population growth was 2.6 percent per year, slightly higher than the VMT growth rate. The population growth rate slowed to about 1 percent per year between 2005 and 2008.
- VMT per capita has declined on average since year 2000, from 26.3 miles to just under 25 miles per day by 2008.
- The longer term historic VMT growth rate, counting from 1995 to 2008, is 1.9 percent per year.

Table 5B.1

Vehicle Miles Traveled in the SACOG Region, 2000 to 2008

County	2000	2005	2008
Average Daily VMT on Roadways[1]			
El Dorado[2]	4,148	4,404	4,249
Placer[2]	7,361	8,581	8,502
Sacramento	29,244	32,145	32,530
Sutter	2,150	2,374	2,444
Yolo	5,132	5,683	5,489
Yuba	1,745	1,849	1,787
Region	49,780	55,034	55,002
Region Pop. (in thousands)[3]	1,896	2,153	2,215
VMT per Capita	26.3	25.6	24.8
Average Annual Growth Rates:	**'00 to '05**	**'05 to '08**	**'00 to '08**
El Dorado[2]	+1.2%	-1.2%	+0.3%
Placer[2]	+3.1%	-0.3%	+1.8%
Sacramento	+1.9%	+0.4%	+1.3%
Sutter	+2.0%	+1.0%	+1.6%
Yolo	+2.1%	-1.1%	+0.8%
Yuba	+1.2%	-1.1%	+0.3%
Region	+2.0%	-0.0%	+1.3%
Region Population[3]	+2.6%	+1.0%	+2.0%
VMT per Capita	-0.5%	-1.0%	-0.7%

1 From "California Public Road Data" reports, compiled from Highway Performance Monitoring System data

2 Adjusted by SACOG to exclude Tahoe Basin

3 California Department of Finance, adjusted by SACOG to exclude Tahoe Basin

Source: SACOG, September 2011.

Vehicle Miles Traveled and the MTP/SCS

Table 5B.2 and Figure 5B.1 provide tabulations and illustrations of historic and projected VMT growth for MTP/SCS.

Weekday VMT in the region is projected to grow from 57 million in 2008 to about 64 million by 2020 (an 11 percent increase) and 74 million by 2035 (a 30 percent increase). Population over the same periods increases by 14 percent and 39 percent, respectively. This compares to 85 million miles by 2035 for the 2008 MTP (see Table 5B.3), which is an increase of 48 percent from 2008, although in part, the extent of the increase in the 2008 MTP relates to higher population growth on which that plan was based.

The VMT growth rate through 2035 is projected to decrease from the historic growth rate of 1.9 percent per year to 1.0 percent per year. Moreover, the VMT growth rate is projected to be lower than the population growth rate of 1.2 percent. This compares to a VMT growth rate of 1.5 percent and 1.5 population growth rate to 2035 for the 2008 MTP.

Table 5B.2

Total Vehicle Miles Traveled in SACOG Region, 2008 and MTP/SCS

County	2008	2020 MTP/SCS	2035 MTP/SCS
Total Weekday VMT on Roadways[1]			
El Dorado[2]	4,421,000	4,726,800	5,328,200
Placer[2]	8,846,500	10,559,400	12,743,900
Sacramento	33,848,800	37,386,300	43,133,000
Sutter	2,543,500	2,785,700	3,269,300
Yolo	5,711,500	6,477,500	7,413,800
Yuba	1,859,500	2,104,100	2,420,100
SACOG Region	57,230,800	64,039,800	74,308,300
Total VMT per Capita	**25.8**	**25.4**	**24.1**
Annual Average Growth Rates, from 2008			
El Dorado[2]	n/a	+0.6%	+0.7%
Placer[2]	n/a	+1.5%	+1.4%
Sacramento	n/a	+0.8%	+0.9%
Sutter	n/a	+0.8%	+0.9%
Yolo	n/a	+1.1%	+1.0%
Yuba	n/a	+1.0%	+1.0%
SACOG Region	n/a	+0.9%	+1.0%
Total VMT per Capita	**n/a**	**-0.1%**	**-0.3%**
Population Growth Rate	n/a	+1.1%	+1.2%

[1] Roadway VMT is tallied based on the location of the roadway on which the VMT is forecasted to occur. It is comparable to the VMT reported in "California Public Road Data" reports; however, the CPRD reports average daily VMT, while this table reports typical weekday VMT. Typical weekday traffic is on average 5 percent higher than average daily traffic.

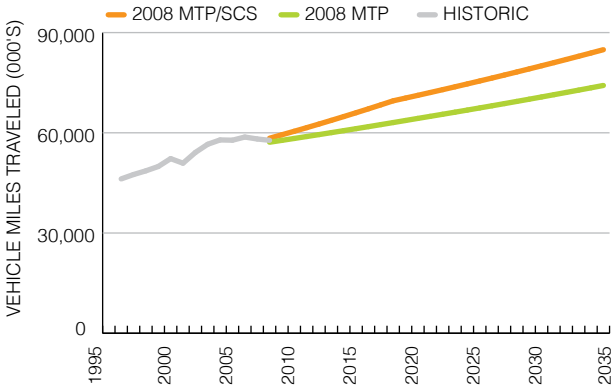
[2] Tahoe Basin roadways are excluded from this tabulation

Source: SACOG, September 2011.

Although VMT increases in total through 2035 for the MTP/SCS, per capita VMT rates decline significantly over the same period. Total VMT per capita declines from 25.8 miles in 2008, to 25.4 by 2020, and 24.1 by 2035, as shown in Table 5B.2 above and in Figure 5B.2. Figure 5B.2 shows VMT per capita for the 2002 MTP, the 2008 MTP and the MTP/SCS. The 6.9 percent decline in VMT per capita for the MTP/SCS compares to a 5.2 percent decline for the 2008 MTP, and a 8 percent increase (compared to 2000) for the 2002 MTP.

Figure 5B.1

Total Vehicle Miles Traveled in the SACOG Region, Historic Trends and Projected MTP/SCS

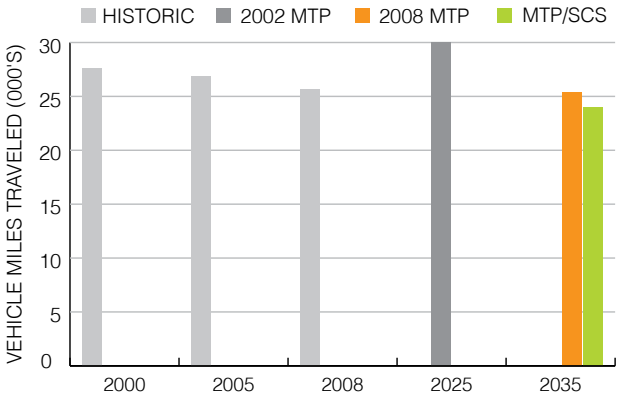


Historic based on CPRD reports. MTP/SCS based on SACOG forecasts. 2008 MTP from SACOG, A Creative New Vision for Transportation in the Sacramento Region, April 2008.

Source: SACOG, September 2011.

Figure 5B.2

Weekday Vehicle Miles Traveled per Capita in the SACOG Region, Historic Trends and Projected MTP/SCS



Historic based on CPRD reports. MTP/SCS based on SACOG forecasts. 2008 MTP from SACOG, *A Creative New Vision for Transportation in the Sacramento Region*, April 2008. 2002 MTP from SACOG, *A Bold First Step for Mobility in the Sacramento Region*, 2002, with adjustments to allow for comparison to more current VMT estimates.

Source: SACOG, September 2011.

VMT by Source

As mentioned above, three sources of VMT are considered: household-generated, commercial vehicle, and external. Household-generated—which includes all travel by residents of the region for work, school, shopping and other household purposes—accounts for almost three-quarters of all VMT in all scenarios. Table 5B.3 provides a tabulation of VMT by source in the region for 2008 and 2035. Household-generated VMT per capita is projected to decrease from 19.3 miles in 2008 to 17.6 miles by 2035 for MTP/SCS, a decrease of 8.8 percent. This compares to 18.3 miles per capita by 2035 for the 2008 MTP.

Commute VMT as a share of total household-generated VMT decreases from 46 percent in 2008 to 44 percent for the MTP/SCS (Table 5B.3), in part due to reductions in the number of workers as the population ages. Commute travel

includes all travel by workers from home to work and back home, including any intermediate stops for other non-work activities (e.g., to drop off a child at school, to shop, or to attend to personal business).

Commercial vehicle and external VMT changes are less dramatic than those for household- generated travel. Commercial vehicles and external travel are influenced by factors outside of the SACOG region, such as national trends and markets for goods movement, growth and development in neighboring regions. Household-generated VMT is a measure that focuses more on factors that can be controlled within the SACOG region. Combined commercial vehicle and external travel is normalized by jobs, not population, for this comparison. In general, jobs drive these two VMT sources. By 2035, the MTP/SCS would result in virtually no change in these VMT sources. This compares to the 2008 MTP, which resulted in a small increase (2 percent).

Table 5B.3
Vehicle Miles Traveled by Source in SACOG Region, 2008 and 2035 MTP/SCS

Variable	2008	2035 MTP/SCS	2035—from 2008 MTP[5]
Weekday VMT by Source			
Household-Generated Commute VMT[1]	19,773,600	23,916,800	
Household-Generated Other VMT[1]	22,871,100	30,301,200	61,271,000[4]
Total Household-Generated VMT[1]	42,644,700	54,218,000	
Commute Share of Household-Generated VMT	46%	44%	
Commercial Vehicle VMT[2]	9,535,300	13,191,400	23,608,000[4]
Externally Generated VMT[3]	4,998,600	6,763,900	
Total VMT	**57,178,600**	**74,173,300**	**84,879,000**
Per Capita or Per Job Rates			
Population	2,215,000	3,086,200	3,348,000
Jobs	969,800	1,330,000	1,546,200
Household-Generated VMT per Capita	19.3	17.6	18.3
Commercial Vehicle + External VMT per Job	15.0	15.0	15.3
Total VMT per Capita	25.8	24.0	25.4
Percent Changes in VMT Per Capita or Per Job, compared to 2008			
Household-Generated VMT per Capita	n/a	-8.8%	-5.2%
Commercial Vehicle + External VMT per Job	n/a	--	+2.0%
Total VMT per Capita	**n/a**	**-6.9%**	**-1.8%**

1 Household-generated VMT is cumulative vehicle travel by residents of the region, for their travel within the region. Total household-generated VMT is split into commute (i.e., all VMT generated by workers going from home to work and back, with any stops along the way), and other (all non-commute).

2 Commercial vehicle VMT is cumulative vehicle travel for moving goods, services and freight within the region. It includes commercial travel in passenger vehicles, light trucks, and vans as well as in larger trucks.

3 Externally-generated VMT is cumulative vehicle travel from residents outside the region, but who travel to destinations within the region, or travel through the region.

4 Commercial and external travel was combined in the 2008 MTP document.

5 SACOG, 2008 MTP, *A Creative New Vision for Transportation in the Sacramento Region*, April 2008.

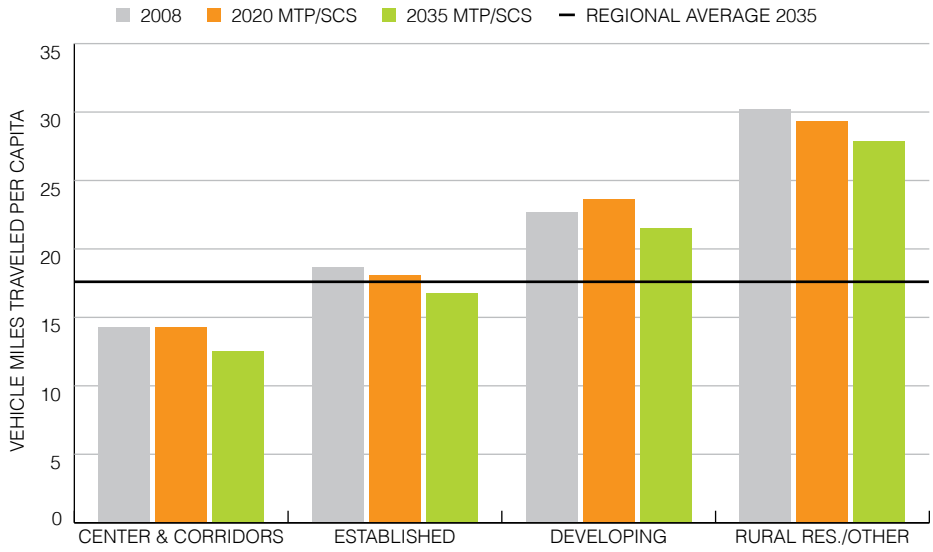
Source: SACOG, September 2011.

Figure 5B.3 provides an illustration of household-generated VMT per capita by the Community Type (defined fully in Chapter 3—Land Use Forecast) of the household's place of residence. This measure rolls up all VMT generated by a household, regardless of where the VMT actually occurs, to the place of residence of the traveler(s) in that household.

- Residents of Center and Corridor Communities have the lowest per capita VMT for the MTP/SCS of all Community Types: 14.3 miles in 2008, decreasing to 12.5 miles by 2035. Centers and Corridors have the most compact land uses, which support walking and biking for shorter trips, and have the greatest access to transit, which provides alternatives to driving for longer trips.
- Residents of Established Communities have the next lowest per capita VMT: 18.7 miles in 2008, decreasing to 16.8 by 2035. Although Established Communities are neither as compact nor as well served by transit as Centers and Corridors, because of the proximity of Established Communities to existing developed areas, especially employment centers, there are more options for making shorter vehicle trips.
- Residents of Developing Communities have the next lowest per capita VMT: 22.7 miles in 2008, decreasing to 21.5 by 2035. Both of these levels are above the regional average (19.3 miles for 2008, and 17.6 for 2035). There are a number of factors related to these VMT rates. First, by 2035 the Developing Communities in the SCS are only partially built-out. Because these areas are in general at the edges of the urbanized area where factors like regional accessibility are below average (see Table 5A-2), partial build-out limits the potential for land use and transportation factors to reduce VMT. Also, transit service in these areas, while present in the SCS, is limited. As Developing Communities develop more fully, and the full value of planned land uses in these areas emerge, the VMT rates for residents should drop significantly.
- Residents of Rural Residential Communities and Lands not Identified for Development in the MTP/SCS are similar in VMT per capita: about 30 miles in 2008, declining to about 28 miles in 2035. Because of the locations of these Community Types, options for shortening vehicle trips are few, and most of the areas have limited, if any, transit service.

Figure 5B.3

Weekday Household Vehicle Miles Traveled per Capita by Community Type in the SACOG Region[1]



[1] Household-generated VMT as defined in this report is rolled up to place of residence, and then totaled to the Community Type of the place of residence.

Source: SACOG, September 2011.

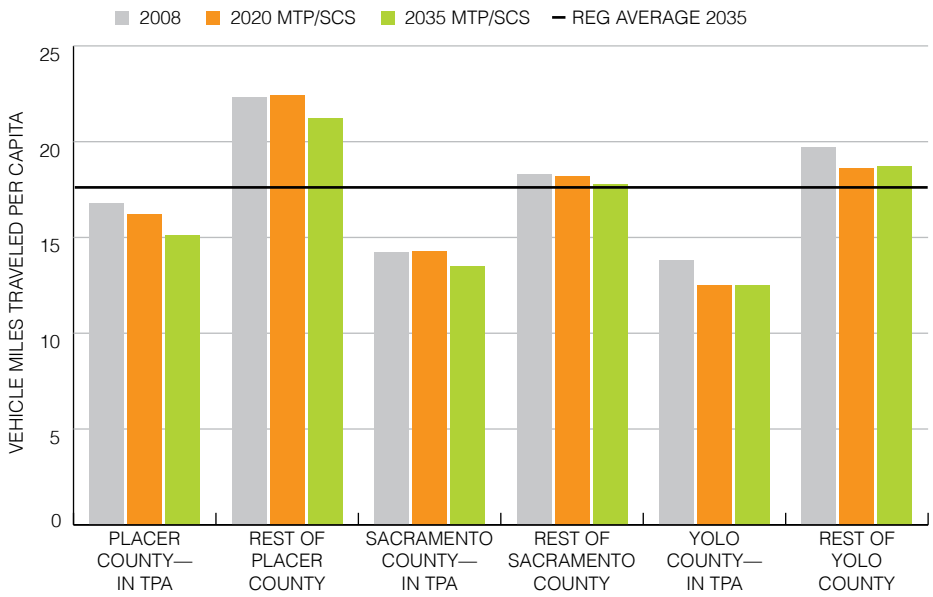
Figure 5B.4 provides an illustration of household-generated VMT per capita rates for residents of Transit Priority Areas (TPAs), compared to residents outside the TPAs in Placer, Sacramento and Yolo counties.

- Residents of TPAs overall have VMT per capita rates 20 to 30 percent lower than the rates for residents outside the TPAs within the same counties. For example in Sacramento County, TPA residents average 14.2 VMT per capita in 2008, declining to 13.5 VMT by 2035; for Sacramento County residents outside TPAs, VMT per capita rates are 18.3 VMT in 2008, declining to 17.8 by 2035.
- For all TPA areas, residents' VMT per capita rates are below the regional average for 2035 (17.6 VMT). Residents of TPAs in Placer County are 8 percent below the regional average in 2035, while residents of Sacramento and Yolo County TPAs are 25 and 30 percent below the regional average. The variation across counties relates in part to the extent of the TPAs in each county: the Placer County TPA is expected to include about 33,000 people by 2035, while the Sacramento and Yolo County TPAs include 750,000 and 150,000 people, respectively.

The overall lower VMT per capita for residents of TPAs is in part due to higher use of transit and non-motorized modes of travel (discussed in Chapter 5C), and in part due to better overall accessibility of TPA areas within the region.

Figure 5B.4

Weekday Vehicle Miles Traveled per Capita by Transit Priority Areas in the SACOG Region[1]



[1] Household-generated VMT as defined in this report is rolled up to place of residence, and then totaled to the TPA areas of the place of residence within counties.

Source: SACOG, September 2011.

VMT and Commute Travel

Commute travel accounts for 46 percent of all household-generated travel, a share which declines to 44 percent by 2035 for the MTP/SCS (see Table 5B.3). Table 5B.4 provides a tally of commute VMT by Community Type, normalized by the number of workers in those areas.

- Commute VMT per worker declines 8.8 percent, from 20.5 miles per worker in 2008 to 18.7 miles by 2035.
- Workers residing in Center and Corridor Communities have the lowest commute VMT per worker—about 30 percent below the regional average for all scenarios. Workers residing in Developing Communities have commute VMT per worker 17 to 21 percent above regional average; workers residing in Rural Residential and lands not identified for development in the MTP/SCS have commute VMT per worker nearly 60 percent above the regional average.
- All Community Types show declines in commute VMT per worker by 2035, ranging from 8 to 10 percent compared to 2008 levels.

Table 5B.4

Commute Vehicle Miles Traveled by Community Type in SACOG Region

Geography	2008	2020 MTP/SCS	2035 MTP/SCS
Center/Corridor Communities			
Household-Generated Commute VMT[1]	1,337,700	1,766,300	2,160,000
Resident Workers	95,700	125,400	170,900
Commute VMT per Worker	14.0	14.1	12.6
% Change from 2008 Per Worker Rate	n/a	+0.8%	-9.6%
Established Communities			
Household-Generated Commute VMT[1]	14,888,400	15,398,700	15,154,900
Resident Workers	743,600	809,700	836,300
Commute VMT per Worker	20.0	19.0	18.1
% Change from 2008 Per Worker Rate	n/a	-5.0%	-9.5%
Developing Communities			
Household-Generated Commute VMT[1]	787,000	2,360,500	4,186,800
Resident Workers	32,700	96,900	188,300
Commute VMT per Worker	24.1	24.4	22.2
% Change from 2008 Per Worker Rate	n/a	+1.2%	-7.6%
Rural Residential Communities			
Household-Generated Commute VMT[1]	2,431,600	2,391,600	2,415,100
Resident Workers	74,800	78,700	81,000
Commute VMT per Worker	32.5	30.4	29.8
% Change from 2008 Per Worker Rate	n/a	-6.5%	-8.3%
Region Total			
Household-Generated Commute VMT[1]	19,444,701	21,917,101	23,916,801
Resident Workers	946,800	1,110,700	1,276,500
Commute VMT per Worker	20.5	19.7	18.7
% Change from 2008 Per Worker Rate	n/a	-3.9%	-8.8%

[1] Commute tours combine all trips from home to work and back to home into one unit. Tours are roughly equivalent to commute round trips.

Source: SACOG, November 2011.

Key Factors Related To Declining VMT per Capita

It is impossible to attribute the full decline in VMT per capita (8.3 percent in household-generated VMT, and 6.6 percent in total VMT) to specific policies or factors. However, the list of factors that will contribute to the reduction includes:

- Improvements in Accessibility (i.e., the number of activities which can be reached within a given travel time)—In Chapter 5A, Table 5A-2 illustrates how this factor changes by 2035 for the MTP/SCS. Because the growth that occurs between 2008 and 2035 is more compact, the number of activities within a reasonable travel time increases by 31.3 percent. This change means that most residents will be able to find jobs, schools, shopping, and other activities closer to their place of residence, and their vehicle trips will be shorter.
- Improvements in Mix of Land Uses—Table 5A-2 also shows that most areas within the region improve to some degree in the balance of complementary land uses. This allows for a higher share of wants and needs to be met closer to a place of residence, which in turn allows for shortening of vehicle trips and creates more opportunities for non-motorized travel.
- Improvements in Transit Service and Walkability—Shifts in mode of travel from private vehicle (e.g., driving alone and carpooling) to non-auto modes (i.e., transit, bicycling and walking) are another key factor, which will be discussed in greater detail in Chapter 5C.

In addition to these land use/transportation factors, several external factors influence the decline in VMT per capita to some degree: projected increases in auto operating costs, driven by higher fuel prices expected in the future; and aging of the population, which is likely to result in less out-of-home activities, and in turn, less travel for a significant percentage of the population.

Roadway Congestion and Delay

This section: defines roadway congestion and discusses why SACOG measures it; reports observed trends in roadway congestion in the region; reports the roadway congestion performance of the MTP/SCS; explains the roadway congestion performance of the MTP/SCS; and then discusses the relationship between congestion and roadway efficiency.

What is Roadway Congestion and Why Do We Measure it?

Roadway congestion is an indicator with a much less specific and determined definition than VMT. In general, congestion occurs on roadways when the number of drivers who wish to use a particular route exceeds the capacity of that route. The typical signs of congestion are stop-and-go driving conditions on freeways, lines of drivers and vehicles waiting to get through a traffic light or from a ramp onto or off a freeway, and the accompanying frustration experienced by those drivers and passengers.

Delay, in general, refers to time wasted traveling on congested facilities. However, to quantify that delay requires some presumption of what time it should take to travel on a particular route, or a standard travel time which drivers and passengers should expect. Setting a standard by which delay can be quantified is a subjective exercise. For example, some might define a standard travel time as free-flow or totally uncongested conditions. The standard for freeways by this definition might be 60 MPH, and the standard travel time would be 1 minute for a one-mile stretch of freeway. If the actual travel speed, with congestion, was 40 MPH, the travel time would be 1.5 minutes, and the delay for each driver and passenger in that condition would be 30 seconds. Others may define the standard as a modest or tolerable level of congestion. For the same one-mile stretch of freeway, someone might define 35 MPH as the standard for measurement of delay—this is approximately the speed of travel for optimal throughput on a freeway lane. With the same actual travel speed of 40 MPH, no delay would be experienced, because the actual speed is higher than the standard.

SACOG has always focused more on the presence of congestion on roadways rather than an amount of delay. Specifically, SACOG estimates and tracks how much of the total VMT occurs on roadways that are at or above their reasonable capacities. SACOG defines a congested VMT (CVMT) as a VMT that occurs on roadways with volume-to-capacity ratios of 1.0 or greater. An example of CVMT is a vehicle and its driver and passenger(s) going westbound on I-80 during the busy morning commute period between Madison Avenue and the I-80/Capital City Freeway split, or on Hazel Avenue between Madison and Winding Way during commute hours.

Observed Data and Historic Trends in Roadway Congestion

While VMT has been consistently and comprehensively monitored in the region since the mid-1990s, monitoring of congestion and delay inform CMP activities. Two sources are presented here.

Delay data have been collected by Caltrans, primarily on freeway facilities, since 1998. Caltrans defines 35 MPH as a travel speed standard for freeways, with delay calculated as the difference between actual travel time and travel time at 35 MPH for the vehicles on the roadway segment in question. Caltrans collects field data for this measure annually (known as HICOMP data). Freeway delay by this measure is presented in Table 5B.5.

Delay estimates have been made for the Sacramento urbanized area (as well as most other urbanized areas in the U.S.) by the Texas Transportation Institute (TTI) annually since 1990 (see Table 5B.5)[3]. The standard for delay in the TTI reports is free-flow conditions, compared to 35 MPH for the Caltrans measure. TTI considers arterial and surface street conditions as well as freeways. Finally, TTI attempts to account for vehicle occupancy, and estimate passenger delay, rather than vehicle delay. For all of these reasons, the TTI measure is a much bigger number in scale than the Caltrans measure. Despite these differences, these two sources show similar trend lines in delay:

- Very high increases in delay during years 2000 to 2005 (+14.9 percent per year in HICOMP data, and +9.2 percent per year in the TTI data).
- High decreases during the years 2005 to 2008 (-19.1 percent per year in HICOMP, -10.0 percent per year in TTI). Although the factors which influence the amount of delay experienced by travelers is complicated, an over-arching factor affecting this extraordinary increase and then decrease in delay is the level of economic activity in the region. Since delay is strongly influenced by travel conditions during peak periods, the amount of work travel affects the amount of delay, all else being equal. Regional unemployment rate in 2000 was about 6 percent, and in 2005, it dropped below 5 percent; in 2008, it was nearly 12 percent.
- For the entire period between 2000 to 2008, both measures show delay modestly increasing (+0.8 percent per year in HICOMP, and +1.6 percent per year in TTI).

Chapter 9—Economic Vitality, discusses the TTI calculation of the total cost of congestion, estimated at $603 million in the region in 2010.

Included in Table 5B.5 are estimates of congested VMT. Compared to the delay estimates, the changes in congested VMT are somewhat muted. For example, congested VMT was estimated to have increased by 7.6 percent between 2000 and 2005, compared to 9.2 and 14.9 percent for the two delay measures. Similarly, the 2005 to 2008 declines in delay were much greater than the estimated decline in congested VMT. There are several factors which may explain this. First, the delay estimates take account of the severity of congestion, while congested VMT takes account of the presence of congestion. For example, a roadway segment which may be 20 percent over normal capacity may have more severe delay due to vehicles moving slowly through interchanges or on/off ramps and other detailed operational factors.

[3] TTI recently revised its process for estimating delay, using to a much greater degree actual data on travel times collected by Inrix, Inc., and re-estimated its entire time series for each urbanized area. These revisions were published after the publication of the 2008 MTP. Differences in TTI data from that in the 2008 MTP *A Creative New Vision for Transportation in the Sacramento Region* are due to this change.

Table 5B.5
Historic Travel Delay in the SACOG Region

Congestion/Delay Measure	2000	2005	2008
Freeway Vehicle Hours of Delay (daily)[1]	10,896	21,832	11,576
All Road Traveler Hours (yearly, in thousands)[2]	24,506	38,076	27,781
Congested Vehicle Miles Traveled (weekday, in thousands)[3]	2,541	3,659	3,298
Annual Average Growth Rates	**'00 to '05**	**'05 to '08**	**'00 to '08**
Freeway Vehicle Hours of Delay[1]	+14.9%	-19.1%	+0.8%
All Road Traveler Hours of Delay[2]	+9.2%	-10.0%	+1.6%
Congested Vehicle Miles Traveled[3]	+7.6%	-3.4%	+3.3%

[1] Caltrans District 3 "Highway Congestion Monitoring Program Reports." Caltrans defines delay as the difference between travel time at 35 MPH and actual travel time for state highways. All segments included in the monitoring reports for the SACOG region are freeways.

[2] Texas Transportation Institute "Urban Mobility Report" for Sacramento urbanized area. TTI estimates delay as the difference between free flow travel time and actual travel time, including both surface streets and freeways.

[3] SACOG estimates, made using SACSIM regional travel demand model. Congested VMT are VMT occurring on roadways at or near generalized hourly capacity.

Source: SACOG, September 2011.

Roadway Congestion and the MTP/SCS

Several principles guided the development of the roadway network for the three scenarios discussed at the MTP workshops held in October 2010 (and described in more detail in Chapter 2—The Planning Process). Based on the results of those public workshops and direction from the SACOG Board for development of the MTP/SCS, the following principles guided development of the MTP/SCS roadway system.

- For freeways, emphasizes new investments at major current bottleneck locations and congestion points. Examples of these investments are:
  - providing alternative modes of travel, which reduces demand in bottleneck locations and provides travel options for commuters and other travelers to avoid the worst congestion (e.g., dedicated transit lanes on the Watt/U.S. 50 interchange and express bus services along new high-occupancy vehicle (HOV) lanes in congested areas);
  - constructing the Green Line light rail extension in the I-5/Natomas corridor;
  - increasing frequency of commuter and express bus lines from Yolo, Yuba, Sutter, Placer and El Dorado counties into downtown Sacramento; and
  - providing new Class 1 bicycle paths (see section on non-motorized travel improvements in Chapter 5C for more detail).
- In some locations, adds auxiliary lanes and/or makes operational improvements to freeways to reduce delays and improve efficiency of the roadway system. Examples:
  - new auxiliary lanes on the Capital City Freeway-American River Bridge, (the worst single freeway bottleneck in the region);
  - operational improvements to I-80 through Roseville and on U.S. 50 through Rancho Cordova and Folsom;
  - improvements to the I-5/SR-113 interchange in Woodland; and
  - spot improvements in other locations.
- Adds freeway HOV lanes to provide carpooling options to avoid the worst peak period congestion, including:
  - I-80 HOV lanes between I-5 and Watt in Sacramento County;
  - U.S. 50 in El Dorado County and in Sacramento County from Watt Avenue to SR-99; and
  - I-5 into downtown Sacramento from the north and south.
- Provides new or expanded local street connections across rivers to serve shorter trips in congested corridors, such as:
  - new crossings of the Sacramento and American rivers into downtown Sacramento; and
  - widening crossings of the Feather River between Yuba City and Marysville.

- Provides modest new and expanded surface streets serving longer trips in areas where freeways and other restricted access facilities have not been developed, including:
  - improvements and widening of the Southeast Capital Connector corridor;
  - construction of the initial phases of the Placer Parkway and Lincoln Bypass in Placer County; and
  - completion of widenings and improvements on SR-70 in Yuba County and SR-99 in Sutter County.

Estimates of congested VMT in the future were made using SACOG's travel demand models, and are shown in Table 5B.6 and Figures 5B.5 and Figure 5B.6.

Congested VMT are estimated to increase from 3.3 million daily miles in 2008 to 4.3 million miles in 2035 under the MTP/SCS. This is a total increase of 30 percent from 2008, and an average annual increase of 1.0 percent over the same time period. This increase compares to a 112 percent increase in the 2008 MTP, or a 2.8 percent annual growth rate.

However, congested VMT per capita declines relative to 2008. Per capita congested VMT was estimated to be 1.49 miles in 2008, and 1.39 miles by 2035 for the MTP/SCS, a decline of 6.9 percent. This compares to per capita congested VMT in the 2008 MTP of 2.09. The improvement in roadway congestion per capita traces back to the 2002 MTP. In that Plan, SACOG projected a 58 percent increase from 2002 to 2025. The 2008 MTP, with a longer planning period from 2005 to 2035, projected a 22 percent increase in the same measure. With a 7 percent decrease from 2008 to 2035, the MTP/SCS projects further reduction in one of the most troublesome aspects of regional travel. This progression through the last two plans and the MTP/SCS is illustrated in Figure 5B.6.

Table 5B.6
Congested Travel in the SACOG Region, 2008 and MTP/SCS

Variable	2008	2035 MTP/SCS	2035 from 2008 MTP[2]
Total Congested VMT[1]	3,297,500	4,278,700	6,990,000
Population	2,215,000	3,086,200	3,348,000
Cong. VMT per Capita	1.49	1.39	2.09
% Change from Base Year of Plan	n/a	-6.9%	+22%[3]
% Change from '08 MTP	n/a	-33.6%	n/a

[1] SACOG estimates made using SACSIM regional travel demand model. Congested VMT are VMT occurring on roadways at or near generalized hourly capacity.

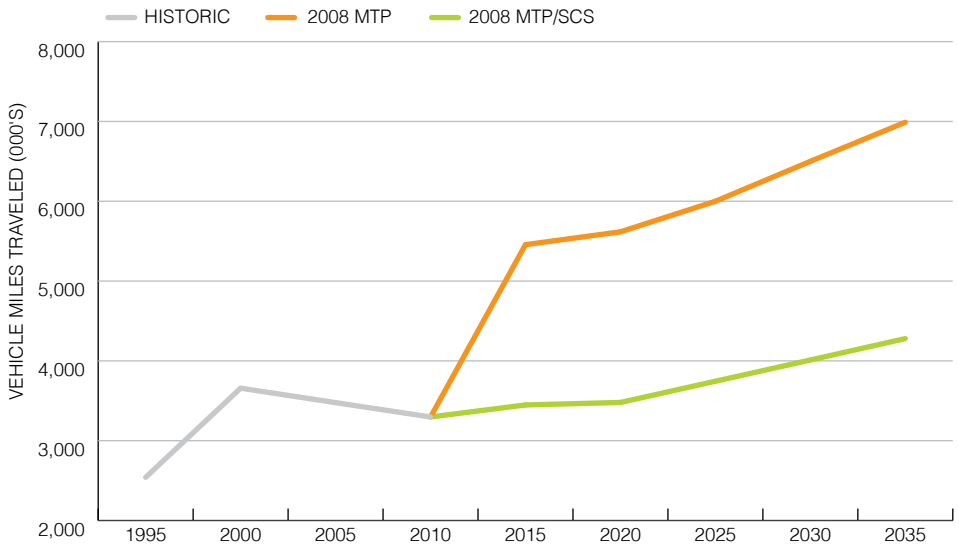
[2] SACOG, 2008 MTP A Creative New Vision for Transportation in the Sacramento Region, April 2008.

[3] The base year for the 2008 MTP was 2005, which had higher congestion levels than 2008 (approximately 1.7 miles per capita). Comparing the 2008 MTP end year to 2008, the change in per capita congested VMT would be 40 percent.

Source: SACOG, September 2011.

Figure 5B.5

Total Congested Travel in the SACOG Region, Historic Trends and Projected MTP/SCS

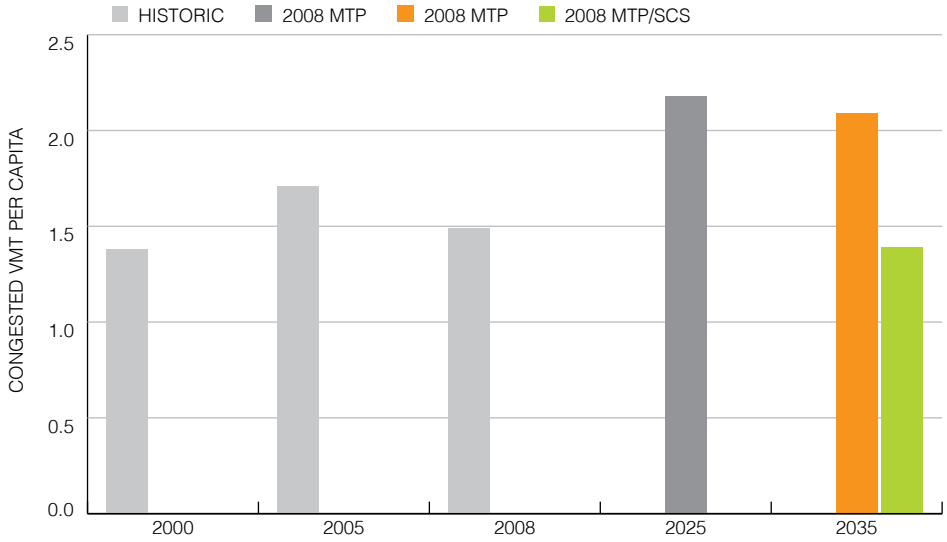


Historic and MTP/SCS based on SACOG forecasts/estimates. 2008 MTP from SACOG, *A Creative New Vision* for Transportation in the Sacramento Region, April 2008.

Source: SACOG, September 2011.

Figure 5B.6

Congested Vehicle Miles Traveled per Capita in the SACOG Region, Historic Trends and MTP/SCS



Historic and MTP/SCS based on SACOG forecasts/estimates. 2008 MTP from SACOG, *A Creative New Vision for Transportation in the Sacramento Region*, April 2008. 2002 MTP from SACOG, *A Bold First Step for Mobility in the Sacramento Region*, 2002, with adjustments to allow for comparison to more current congested VMT estimates.

Source: SACOG, September 2011.

Congested VMT by Source and Community Type

Table 5B.7 provides a tabulation of household-generated, commercial vehicle, and external congested VMT in the SACOG region for 2008 and 2035. Total congested VMT increases 6 percent by 2020, and 30 percent by 2035, for the MTP/SCS. Congested VMT generated by households increases the least, from 2.6 million to 3.3 million by 2035 for the MTP/SCS, an increase of 25 percent. Commercial vehicle and externally generated congested VMT increases more over the MTP/SCS planning period: commercial vehicle congested VMT increases by 40 percent, and externally generated travel by 75 percent from 2008. One reason for this apparent disparity is that more of the land use and transportation elements of the MTP/SCS are targeted at travel by residents of the region, which allow those residents to avoid the most congested routes. For example, the new Green Line light rail extension into Natomas allows residents of that corridor to avoid congestion on I-5; that option is not available to commercial vehicles and most residents of areas outside the region.

Table 5B.7 also provides congested VMT normalized by population (per capita) for household-generated travel, and by jobs for commercial vehicle and externally generated travel. Household-generated congested VMT per capita declines from 1.19 VMT per person in 2008 to 1.07 by 2035, a decline of 10.4 percent. Congested VMT experienced by commercial vehicles, normalized by the number of jobs in the region, increases from 0.69 VMT per job in 2008 to 0.75 in 2035, an increase of 8.7 percent. Total congested VMT from all sources declines on a per capita basis from 1.49 miles per capita in 2008, to 1.38 miles by 2020, and holding nearly steady from 2020 to 2035.

Table 5B.7

Congested Vehicle Miles Traveled by Source in the SACOG Region, 2008 and the 2035 MTP/SCS

Travel Source	2008	2020 MTP/SCS	2035 MTP/SCS
Region Total			
Household-Generated Commute CVMT[1]	1,711,500	1,757,100	2,128,300
Household-Generated Other CVMT[1]	921,100	988,200	1,159,500
Household-Generated CVMT[1]	2,632,600	2,745,300	3,287,800
Commute Share of Household-Generated CVMT	65%	64%	65%
Commercial Vehicle CVMT[2]	489,100	525,300	682,900
Externally Generated CVMT[3]	175,800	208,000	308,000
Total CVMT	3,297,500	3,478,600	4,278,700
Per Capita Rates			
Population	2,215,000	2,519,900	3,086,200
Jobs	969,800	1,072,200	1,330,000
Household-Generated CVMT per Capita	1.19	1.09	1.07
Commercial Vehicle + External CVMT per Job	0.69	0.68	0.75
Total CVMT per Capita	1.49	1.38	1.39
Percent Changes in Congested VMT Per Capita or Per Job, compared to 2008			
Household-Generated CVMT per Capita	n/a	-8.3%	-10.4%
Commercial Vehicle + External CVMT per Job	n/a	-0.2%	+8.7%
Total CVMT per Capita	n/a	-7.3%	-6.9%

[1] Household-generated CVMT is cumulative vehicle travel by residents of the region on roadways which are at-or-above capacity, for their travel within the region. Household-generated CVMT is split into commute and other shares.

[2] Commercial vehicle VMT is cumulative vehicle travel for moving goods, services and freight within the region. It includes commercial travel in passenger vehicles, light trucks, and vans as well as in larger trucks.

[3] Externally generated VMT is cumulative vehicle travel from residents outside the region, but who travel to destinations within the region, or travel through the region.

Source: SACOG, November 2011.

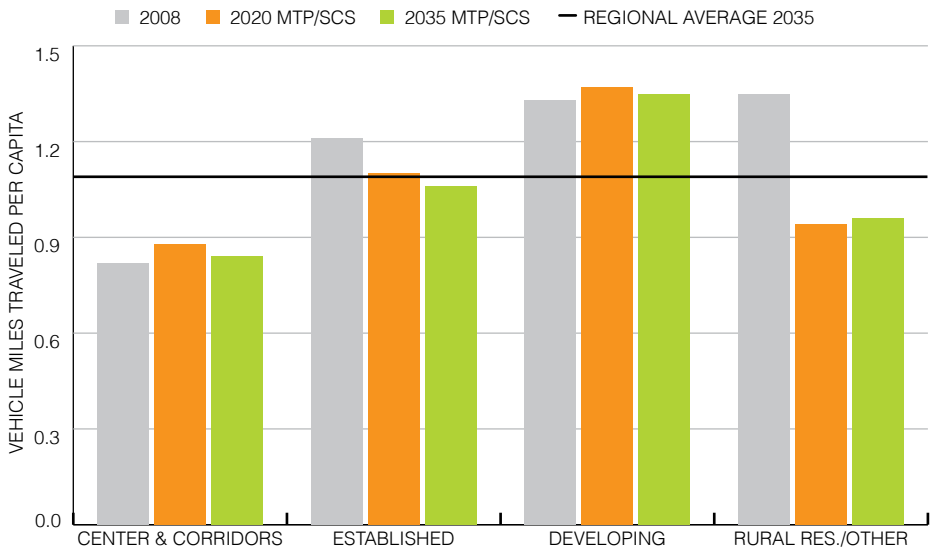
Figure 5B.7 provides an illustration of congested VMT per capita for household-generated travel only, tallied back to the Community Type of the residence of the travelers. The amount of congested VMT which residents of the different Community Types would experience varies widely:

- For residents of Center and Corridor Communities, the average amount of congested travel a resident would experience increases very slightly, from 0.82 miles per capita in 2008 to 0.84 miles in 2035. Although increasing, the 2035 congested VMT per capita for Center and Corridor Community residents is still nearly 20 percent below the 2035 regional average. In part, this is due to much lower commute VMT per capita (see Table 5B.4), and in part due to the availability of transit options during peak periods, when congestion is worst.
- For residents of Established Communities, the average amount of congested travel is, not surprisingly, near the average. About two-thirds of all residents of the region by 2035 would reside in Established Communities, so their travel strongly affects the regional average. Per capita congested VMT declines by 12.4 percent over the MTP/SCS planning period.
- Residents of Developing Communities would experience increased congested travel over the MTP/SCS planning period from 1.33 to 1.35 miles per person per day. Residents of these areas would also experience congested travel about 27 percent higher than the regional average of 1.07 miles per weekday. The increase in congested travel for residents of these communities is due to several factors. First, as mentioned above, these communities are expected to be partially, not fully, developed. Because of the location of these communities closer to the edges of the urbanized area, and further from job centers, commutes for workers residing in these areas will tend to be longer than for workers in other communities (see Table 5B.7), which also exposes these workers to more congestion.
- Residents of Rural Residential Communities would experience the biggest reduction in congested travel. The average resident in an area of this type would experience a 30.3 percent reduction in congested travel by 2020, and 28.9 percent by 2035. Additionally, the swing in congestion relative to the regional average is the greatest for residents of these areas: in 2008, residents experienced congested travel nearly 14 percent above the regional average; by 2035, they will be nearly 10 percent below the regional average. A significant driver of this improvement is travel conditions on roadways serving El Dorado County residents which have significant congestion relief in the MTP/SCS.

Figure 5B.7

Congested Vehicle Miles Traveled by Community Type in SACOG Region[1]

[1] Household-generated congested VMT as defined in this report is rolled up to place of residence, and then totaled to the Community Type of the place of residence.



Source: SACOG, September 2011.

Congested VMT and Commute Travel

Commuting and congestion go together, for some obvious and less-obvious reasons. The most obvious reason is that the majority of commute travel occurs during peak periods, when travel demands frequently exceed available capacity, resulting in congestion. Peak periods are defined by when commute travel occurs. For example, in the SACOG region, during the period between 7:00 and 10:00 a.m., approximately 70 percent of all workers and students arrive at their workplace or school (see Figure 5B.8), with 30 percent arriving during a one-hour period. Conversely, for all other non-work travel (e.g., shopping, personal business), only about 17 percent of all arrivals at the activity location occur during the same three-hour period, with 8 percent occurring during the highest hour. The daily pattern of activities for work and school is bi-modal—that is, it has two extreme peaks, one in the morning and one in the afternoon. The daily pattern for all other activities is much flatter and more distributed over the entire day.

Commuters and students often have very little discretion over when they travel—their times of travel are dictated by their work or school hours. Although the amount of flexibility workers have on when to arrive at work may vary by employer, workers have far less freedom to choose when to travel than a non-working adult making a choice about when to go shopping. This difference makes commuters more willing to endure worse congestion than other travelers would—they endure it because they have little choice.

This relationship between commute travel and congestion is in evidence in the statistics presented earlier in Table 5B.7). Although commute travel accounts for only 41 to 44 percent of household-generated VMT, it accounts for about 65 percent of congested VMT.

Figure 5B.8

Peaks in Time of Travel for Work, School, and Other Trips

Based on 2000 Household Travel Survey.

Source: SACOG, September 2011.

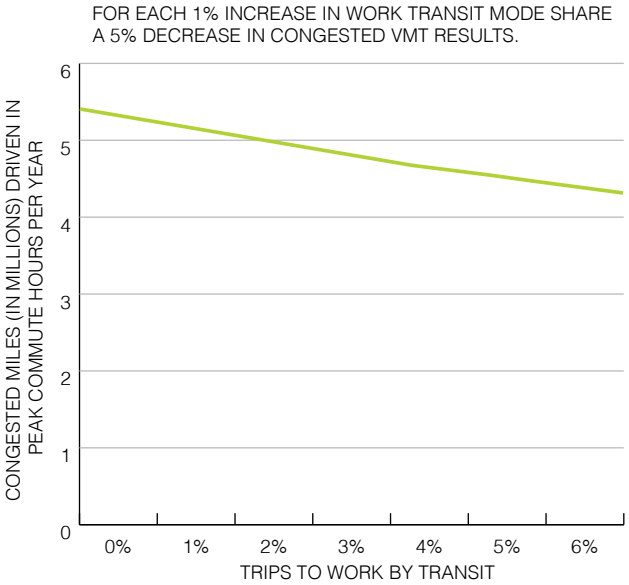
Key Factors Influencing Reduction in Congested Travel in the MTP/SCS

The reduction in congested travel is driven by two basic factors in the MTP/SCS:

- Roadway capacity investments include a significant number of projects that resolve or improve major existing bottlenecks, including several new projects for bottleneck locations not addressed in prior plans.
- On several major congested travel corridors, new transit options are provided in the MTP/SCS. Overall transit mode share increases, and commute transit share increases dramatically—the MTP/SCS forecasts show transit mode share increasing by 5 percentage points, from about 3 percent in 2008 to over 8 percent in 2035 (see Chapter 5C where this issue is discussed in greater detail). There is a strong relationship between the work travel mode share, and the level of congested VMT experienced during the peak period, illustrated in Figure 5B.9. For each incremental percentage point in work travel transit share, congested VMT decreases by 5 percent.[4]

Figure 5B.9

Transit Mode Share and Congested Travel in the SACOG Region



Source: SACOG, September 2011.

[4] Based on modeling by SACOG staff. Note that an increment in work transit mode share from, e.g., 3 percent to 4 percent, which is a 1 percent share increment, represents a 33 percent increase in the number of actual transit trips.

Roadway Utilization and Efficiency

Increasing the productivity of the region's existing transportation infrastructure through more optimal use of the region's roadway system is an important goal for the MTP/SCS. The concept of optimal levels of use of roadways is a new one in transportation planning. Historically, the quality of service has been measured on a simple A-through-F scale, with the implication that level of service A is always better than level of service B, level of service B is better than C and so on. Optimal use takes a slightly different perspective, based not solely on the level of service to individual travelers in motorized vehicles only (which is the focus of level of service measurement), but on some level of system efficiency and on balance of benefit across travel modes[5].

The concept of optimal use applied to roadways starts with a few basic assumptions. First, travel demand is always subject to peaks and valleys, when demand is higher or lower than average. Second, achieving better levels of service during peak demand periods requires progressively greater infrastructure investments, and those investments may only really be used for one or two hours during the day—the rest of the time, those investments essentially sit idle. Finally, optimal use also recognizes that in addition to the infrastructure costs of providing higher levels of service during peak demand periods, those investments impose other costs, too, such as the costs associated with building wider roads, increased physical distances between uses, and making travel by transit, bicycle and walking more costly.

In order to analyze the utilization level of roadways according to this concept, an operational definition was developed based on the methods of evaluating roadway demand and supply in SACOG's SACSIM regional travel demand model. For roadway investments, overall efficiency is measured as the percent of total travel which occurs at optimal levels of use. Optimal use presumes that because of peaks and valleys in demand, and because of the extremely high cost of providing sufficient roadway infrastructure to provide a high level of service during peak demand times, some level of congestion is expected and, in a way, desired, at peak times. If free flow conditions prevail during peak demand times, this is an indication that roadways were over designed, and a high percentage of roadway capacity is un-utilized during non-peak periods. So, the key to defining optimal use is to define optimal utilization levels around moderate or tolerable levels of congestion.

The definition is based on roadway segment volume-to-capacity (V/C) ratios. In concept, segment V/C ratios are similar to intersection V/C ratios which are commonly reported as part of traffic impact studies. For computational efficiency, segment, rather than intersection, V/C ratios are used for regional travel demand models. Segment capacities are set to represent the number of vehicles which can pass through a segment based on normal operating conditions. Freeways, for example, are set at 2,000 vehicles per lane per hour. For surface streets, segment capacities depend heavily on intersection operations, and actual segment capacities can vary widely based on different ways of handling intersection operations (e.g., signalization, presence/absence of turning lanes). A working definition of optimal use needs to take account of some of these characteristics of segment capacities by different functional classes of roadways.

The following V/C ratio ranges were defined as optimal for this analysis:

- For general purpose freeways, V/C ratios between 0.95 and 1.05 (i.e., from 5 percent below to 5 percent above the normal capacity) were defined as optimal. Below the lower threshold, freeways may be considered to be over-capacity; above the upper threshold, congestion is likely to become unmanageable.
- For HOV lanes, it is presumed that a travel time advantage is desired compared to adjacent general purpose freeway lanes, so the optimal utilization level was set at 0.50 to 0.85. At these levels, near free flow speeds would be maintained in the HOV lanes.
- For arterial and expressway roadways, where actual capacities may vary due to intersection operations, a wider range of optimal utilization was specified than for freeways: 0.85 to 1.15.
- Local and collector streets are the streets with the most varied use patterns. For example, local streets are those onto which the majority of houses front, and these streets are not expected to be operating at capacity at any time of the day. In fact the streets may be used for everything from setting out a garbage or recycling container to playing catch with a child. For this reason, the optimal use level was set at a maximum V/C ratio of 0.75, or 75 percent of normal capacity.

The MTP/SCS is projected to increase the percentage of VMT which occurs at optimal utilization level from 28.5 percent in 2008 to 30.4 percent in 2035. Table 5B.8 provides a tabulation of VMT by roadway class by utilization level. The improvement in utilization comes roughly equally from the under-utilized and over-utilized categories; however, overall the share of VMT on over-utilized roadways declines from 4.3 percent to 3.6 percent by 2035.

[5] Milam, Ron, "Transportation Impact Analysis Gets A Failing Grade When It Comes to Climate Change and Smart Growth", published at the California Office of Planning and Research Level of Service Forum website, October 2008, http://opr.ca.gov/sch/pdfs/Ron_Milam_Fehr_and_Peers.pdf

Table 5B.8
Roadway Utilization in the SACOG Region, 2008 and MTP/SCS

	UTILIZATION LEVEL[1,2]			
Roadway Type / Year	**Under-Utilized**	**Optimally Utilized**	**Over-Utilized**	**Total**
2008 Weekday VMT by Road Class				
General Purpose Freeways	21,251,400	1,369,700	878,500	23,499,600
HOV Lanes	413,800	700,300	26,600	1,140,700
Auxiliary Lanes/Ramps	744,300	502,700	269,500	1,516,500
Arterials/Expressways	16,013,500	2,835,300	412,400	19,261,200
Collectors/Local Streets	0	10,904,100	866,600	11,770,700
Total	**38,423,000**	**16,312,100**	**2,453,600**	**57,188,700**
2008 Share of VMT:	**67.2%**	**28.5%**	**4.3%**	**100.0%**
2035 MTP/SCS Weekday VMT by Road Class				
General Purpose Freeways	24,350,600	2,134,600	767,300	27,252,500
HOV Lanes	908,100	2,356,600	134,800	3,399,500
Auxiliary Lanes/Ramps	1,000,000	823,300	370,000	2,193,300
Arterials/Expressways	22,920,900	4,677,700	581,400	28,180,000
Collectors/Local Streets	0	12,614,400	790,100	13,404,500
Total	**49,179,600**	**22,606,600**	**2,643,600**	**74,429,800**
2035 MTP/SCS Share of VMT :	**66.1%**	**30.4%**	**3.6%**	**100.0%**

[1] V/C ratio ranges are based on segment (not intersection) calculations.

[2] Under-Utilized: <0.95 for GP Freeway; <0.50 for HOV and Aux/Ramp; <0.85 for Arterial/Expressway; no minimum for Collectors/Local Streets.
Over-Utilized: >1.05 for GP Freeway; >0.85 for HOV and Aux/Ramp; >1.15 for Arterial/Expressway; >0.75 for Collectors/Local Streets.

Source: SACOG, September 2011.

Key Factors in Increasing VMT in the Optimal Use Range

Discussed above in the sections on VMT and Roadway Congestion are several of the key factors that will lead to better utilization of the region's roadways:

- Targeted investments in projects which ameliorate some of the worst bottlenecks on the region's freeways and major roadways—Reducing the level of congestion at major existing bottleneck locations through targeted auxiliary lanes and operational improvements moves some of those bottlenecks from severe to manageable levels of congestion.
- Right-sizing roadway widening projects—Mentioned above are many locations where roadway widening projects in the MTP/SCS were down-sized from the projects in the 2008 MTP. The reduced-scale projects were often reconfigured as complete streets projects with multi-modal focus. Through the diligent efforts of local agencies in general plan circulation element updates, many of these downsized roadway projects result in more optimal use of roadways than the larger capacity projects they replaced.
- Roadways tied to growth—By tying the construction of new roadway facilities to the land use development and growth assumed in the MTP/SCS, new roadway facilities are better utilized in the MTP/SCS.

Chapter 10—Financial Stewardship provides additional discussion of strategies in the MTP/SCS that increase efficient and productive use of the region's transportation infrastructure.

Chapter 5C

Trends & Performance

Transit, Bicycling, & Walking

Introduction

Building on the performance overview in Chapter 5A, this chapter describes the performance of the MTP/SCS transportation system in terms of transit and non-motorized travel. Chapter 5C is divided into three sections. The first section provides background on the transit and non-motorized (i.e., bicycling and walking) systems in the region; the second section describes past performance of the transit and non-motorized systems and future performance with the implementation of this MTP/SCS; the third section focuses on transit system productivity under this MTP/SCS.

Background on Transit, Bicycling, and Walking

Travel by transit offers many benefits to the performance of the regional transportation network in the Sacramento region. First, transit provides an opportunity for substantially reducing VMT, through shifts from low-occupancy modes like driving alone to a very high occupancy mode of travel. Second, for commute trips, which tend to occur at peak periods of travel demand when congestion is highest, transit can provide substantial congestion relief. High quality transit service can also provide necessary mobility for both transit-dependent and choice riders, and residents and employees in higher density, mixed use areas where auto travel can be impractical.

Like fuel prices, transit fares have gone from a trend line of relative stability in real terms to significant spikes in recent years. Operators increase fares to offset operating revenues lost from other sources. However, the analysis for the MTP/SCS assumed that over the planning period, transit fares will remain steady when adjusted for inflation.

Travel by non-motorized travel modes is also of interest, because the prevalence of travel by the major non-motorized travel modes (i.e., bicycling and walking) is a strong indicator of good land use and transportation planning. By placing complementary land uses in close proximity between residents or employees of an area, and by developing attractive, convenient pedestrian and bicycle environments, the number and percentage of trips made by bicycle or on foot should increase.

The Current Transit System

Transit in the Sacramento region currently encompasses a wide array of services, including urban light rail and bus service; suburban and rural local and commuter bus service; rural lifeline services, often running on limited frequencies; dial-a-ride/paratransit services for seniors and persons with disabilities; and gap-filling social service transportation provided largely by nonprofits and volunteers. Additionally, interregional rail and bus services facilitate long distance trips into and out of the region. In this chapter, when transit service is discussed, it means the following types of transit service and service providers:

Fixed-Route Services

Within the MTP/SCS plan area, the following operators provide local fixed-route service: Sacramento Regional Transit (RT), serving urban Sacramento County; e-Tran, serving the City of Elk Grove; Yolobus, serving Davis, Woodland, West Sacramento, downtown Sacramento, the Sacramento International Airport, and rural Yolo County; Yuba-Sutter Transit, providing intra-city service in the Marysville/Yuba City area, intercity service to Live Oak, Wheatland and the Yuba foothills, and commuter service to Sacramento; City of Auburn, providing intra-city service; Folsom Stage Lines, providing intra-city service; Unitrans, providing intra-city service in Davis with an emphasis on trips to or from the UC Davis Campus; Roseville Transit, operated by the City of Roseville, providing intra-city service and commuter services to Sacramento; City of Lincoln, providing intra-city service; El Dorado County Transit, providing intra-city and intra-county service and commuter service to Sacramento; and Placer County Transit with service connecting Interstate 80 (I-80) communities and service to the Regional Transit light rail stop at Watt Avenue/ I-80.

Transit service in the non-urbanized portion of Sacramento County includes South County Transit Link fixed route services linking the Cities of Elk Grove, Galt, Lodi, Sacramento and other Delta communities. Sacramento County, through a contract with the Amador Regional Transit System, provides fixed route service linking Jackson in Amador County with Rancho Murieta, the 65th Street Light Rail station, and downtown Sacramento. Isleton, through a contract with the City of Rio Vista, provides deviated fixed route service within Isleton and to Rio Vista, Fairfield, Suisun City, Antioch, and the Pittsburg/Bay Point BART station.

Demand-Response Services

Demand-responsive, or complementary ADA paratransit, services provide transportation service required by the Americans with Disabilities Act (ADA) for individuals with disabilities who are unable to use fixed-route transit systems. Demand responsive service must be comparable in total coverage to provided fixed-route service. Some demand-responsive services also provide transportation for seniors meeting specified age criteria regardless of disability, and a few also provide service to the general public. Demand responsive service providers within the MTP/SCS Plan Area include the following operators: South County Transit, providing service in the Galt area; Rio Vista Delta Breeze providing service in the Isleton area; Davis Community Transit, serving the City of Davis; Yolo County Transportation District ADA Yolobus Special Program, serving Woodland, West Sacramento and intercity service needs throughout Yolo County and into Sacramento County; Yuba-Sutter Transit, serving the Marysville/Yuba City urban area; Roseville Transit Dial-A-Ride, serving the City of Roseville; Placer County Transit, serving the Rocklin/Loomis area, Granite Bay, and along the State Route 49 corridor; El Dorado County Transit, operating demand responsive services as far east as Pollock Pines and north to Garden Valley; and Paratransit Inc., the largest paratransit provider in the MTP/SCS Plan Area, providing door-to-door shared-ride, subscription, and intermittent transportation service within Sacramento County, with limited services to Roseville.

Intercity Rail

Intercity passenger rail service also serves as part of the Sacramento region's transportation system, linking passengers to cities within the region as well as other parts of the state and nation. In California, Amtrak operates all state-supported intercity rail service. Caltrans provides operating funds for the three Amtrak in-state routes: the Capitol Corridor (Auburn to San Jose); the San Joaquin (Bay Area/Sacramento to Bakersfield); and the Pacific Surfliner (San Luis Obispo to San Diego). These routes connect with each other and with Amtrak's four long-distance train routes that link California to other states: the Coast Starlight (Los Angeles to Seattle), California Zephyr (Emeryville to Chicago), Southwest Chief (Los Angeles to Chicago), and Sunset Limited (Los Angeles to New Orleans). Many passengers use the state-supported Amtrak routes for intercity travel within California, or as part of longer rail trips. Figure 5C.1 shows intercity rail services in northern California.

Figure 5C.1

Amtrak California Northern California Routes

The Capitol Corridor provides daily rail service between Auburn, Sacramento, Oakland/San Francisco and San Jose. The Sacramento to Oakland segment has 16 weekday round trips and 11 weekend/holiday round trips. One daily round-trip train serves Auburn, plus there are bus connections at other times of the day. Seven round trips continue south to San Jose. The Capitol Corridor carried over 1.7 million passengers in federal fiscal year 2011 and is expected to top 2 million annual passengers by the close of federal fiscal year 2012. It is the Amtrak route with the best on-time performance (94 percent) in the nation.

The Capitol Corridor is operated by Amtrak and administered by the Capitol Corridor Joint Powers Agency (CCJPA) which is made up of representatives along the 100-mile corridor. SACOG is a member of the CCJPA Staff Coordinating Group, which serves as an advisory body to the CCJPA concerning ongoing operations and planning of the service. The partnership between the CCJPA, Amtrak, the California Division of Rail and Union Pacific railroad is considered a national example of successful implementation of passenger rail services.

Operations are funded through the California Public Transit Account, city funds, and fares, which covered 50 percent of the operating costs in federal Fiscal Year 2010–11. Capital costs have been funded through state bond measures, more recently with Federal Railroad Administration grants, and through ongoing maintenance by the rail line owner, Union Pacific. The stations are all owned by the cities along the route.

While the State largely funds the Capitol Corridor and SACOG primarily plays a planning role, some capital improvements are included in the MTP/SCS. These include: design and environmental clearance for a third track between Sacramento and Roseville to improve service frequencies to Roseville; a Yolo Causeway crossover switch to improve train dispatching capabilities; and a new rail alignment through the Sacramento Railyards to allow for smoother operations of freight and passenger rail trains and reduce congestion on the route. A second phase of that project is expected to improve the new train platforms with a newly built station.

The San Joaquin Route provides intercity rail service between the Bay Area and Sacramento and Bakersfield, with bus connections to Los Angeles, Redding, Yosemite National Park and Las Vegas, Nevada. The Sacramento-to-Bakersfield segment has two daily round trips. Four daily round trips between Oakland/San Francisco and Bakersfield are also accessible by Sacramento and Elk Grove riders through Amtrak connecting buses. Amtrak buses also serve the Davis station to allow riders to connect to all San Joaquin trains. The San Joaquin route and connecting points are shown in Figure 5C.1. The San Joaquin exceeded one million annual riders in September 2011. The San Joaquin shares rail equipment, train crews, and maintenance facilities (in Oakland) with the Capitol Corridor. The route is at maximum passenger capacity and additional trains are needed to meet demand.

SACOG staff also participates in the management of this route, as Sacramento County's non-elected appointee to the San Joaquin Valley Rail Committee. The committee meets quarterly to advise Caltrans, Amtrak and the host railroads on improvements to the service.

High-Speed Rail

The California High-Speed Rail Authority is proposing to construct, operate, and maintain a statewide California High-Speed Train Program (CHSTP). When completed, the system would span nearly 800 miles with high-speed electrified train service between the Bay Area, Central Valley, Sacramento, and Southern California. The new system would be grade-separated from road vehicle traffic, and operate almost exclusively on separate, dedicated tracks, with top design speeds of up to 250 miles per hour (MPH) and an operating speed of up to 220 MPH.

Phase 1 would construct about 520 miles of rail between San Francisco and Anaheim. When completed, Phase 1 would provide a 2-hour and 40-minute service between San Francisco and Los Angeles via Merced and Bakersfield. Subsequent phases include a southern extension (Los Angeles to San Diego via the Inland Empire) and a northern extension (Merced to Sacramento). While the MTP/SCS does not specifically address high-speed rail, SACOG's approach has been that it could provide significant benefits in replacing short-distance business and recreational airplane trips with train travel, but should avoid negative consequences of mainly creating Central Valley commuter suburbs by focusing on mixed-use, transit-supportive development, especially at stations in the Central Valley where few jobs currently exist. Figure 5C.2 shows the proposed route for the high-speed rail system.

Figure 5C.2
California High-Speed Rail Proposed Service

Source: California High-Speed Rail Authority, April 2010

The Authority is working on two environmental plans involving the Sacramento region. SACOG is a member of the Central Valley Regional Rail Policy Working Group, which is shepherding the Preliminary Alternatives Analysis for Phase 2 of the system between Merced and Sacramento (SACOG's preference for Phase 1). This Working Group is looking at alternative routes, service types, station locations and other planning activities along the Phase 2 segment, as well as to determine feeder rail service from Sacramento or Stockton to the Merced high-speed rail connection. The Working Group is made up of members from the counties, cities, planning agencies, the Authority, and transit operators in the Merced to Sacramento corridor.

A separate Altamont Working Group is made up of members from the San Francisco/Oakland area, and the Stockton and Sacramento region, including SACOG. This Working Group is looking at feeder service from Sacramento, Stockton and the East Bay to reach the San Jose high-speed rail connection.

The remainder of this chapter focuses on the MTP/SCS and transit within the Sacramento region, rather than intercity or high-speed rail.

The Current Bicycle and Pedestrian System

Many Sacramento region residents walk or bicycle for some of their travel. The majority of trips are short—five miles or less—and of a distance that is bikeable or walkable for many people. The region is home both to people who depend on walking and/or bicycling for some or all of their trips, and to many choice cyclists and pedestrians—people with a car available but who choose to walk or bike to work and other destinations. The rise of bicycling's popularity, increasing gas prices and parking costs, and heightened health and environmental awareness have contributed to the larger number of people biking or walking in place of driving.

Increasing the quantity of supportive infrastructure is essential to supporting bicycle and pedestrian travel. Because inactivity is a significant factor in obesity and many diseases, creating opportunities for people to incorporate walking and biking into everyday travel is also important to improving public health. According to the U.S. Department of Health & Human Services, 55 percent of U.S. adults in do not meet recommended activity guidelines, and approximately 25 percent report being completely inactive.[1] One study found that 43 percent of people with safe places to walk within 10 minutes of home met recommended activity levels; and that only 27 percent of people without safe places to walk met the recommendation. Another found that residents in neighborhoods with sidewalks are 65 percent more likely to walk.

Residents are more likely to walk and bike for transportation when there are continuous networks of sidewalks and bicycle lanes or trails. There are currently almost 2,000 miles of bicycle routes in the region, 56 percent in urban areas, and 44 percent outside of urbanized boundaries in small urban or rural areas. Bicycle facilities in rural areas allow for both utilitarian and recreational bicycle trips. However, 79 percent of rural routes exist on roadway shoulders as Class III bicycle routes—roadways recommended for bicycle travel, without dedicated bike lanes, that provide for shared use with motor vehicles or pedestrian traffic.

About 50–60 percent of existing roads in the urbanized area have no sidewalks, most commonly in suburban areas that were not built as large subdivisions. This share is even higher in rural areas. The federal Americans with Disabilities Act (ADA) mandates that disabled persons must be able to access the transportation system, including streets, roads, and walkways. Under the ADA, public agencies are required to prepare transition plans showing how they intend to provide for this access. Plans have been completed by the cities of Sacramento, Citrus Heights, Galt, and Rancho Cordova, and the counties of Sacramento and El Dorado, and they are now gradually funding and building projects to implement their plans. The plans include a schedule for providing curb ramps at intersections and access improvements on public walkways.

Pedestrian and bicycle access also affects the effectiveness and efficiency of transit service, as most transit trips involve walking or cycling at one or both ends. Commuters are more likely to take transit if they can easily walk or bike from their home or worksite to a transit stop or station. As a result, walking and cycling infrastructure improvements are often an effective way to support transit use. Good intermodal connections, such as convenient park-and-ride locations, on-board bike racks, secure bicycle parking, safe and pleasant access routes, and short-cuts can enhance the appeal of both non-motorized and transit modes. Creating Safe Routes to Transit is a priority for the region. In 2006, SACOG studied bicycle access to light rail and determined that improving and promoting bike access to transit stations would dramatically increase the pool of transit riders and provide a variety of community benefits.

[1] National Complete Streets Coalition, http://www.sacog.org/complete-streets/toolkit/files/docs/NCSC_CS Promote Good Health.pdf

Past and Future Performance of Transit and Non-Motorized Travel

Observed Data and Historic Trends in Transit

The two major measurements of transit ridership are ***passenger boardings*** and ***transit person trips***. A transit person trip encompasses the entire journey from one place (e.g., home) to another place (e.g., school) in order to engage in an activity (e.g., going to class), using transit for the majority of the trip. A passenger boarding occurs each time the traveler enters a transit vehicle during the trip. So, each transit person trip generates at least one passenger boarding. However, if a trip requires one or more transfers from one transit route to another, a single trip may generate two, three or even more passenger boardings. On average in the Sacramento region, passenger boardings number about 35 percent more than trips, with about one-third of transit trips requiring one or more transfers.

Passenger boardings are the most comprehensively tracked transit ridership statistic. All operators routinely collect boarding data. Passenger boardings for all operators of fixed-route services (excluding demand-responsive services) are reported in Table 5C.1. Over the period from 2002 to 2009, total passenger boardings increased by 30.8 percent, compared to 14.1 percent population growth over the same period. However, the largest share of the increase was in light rail boardings, which doubled over this period. Bus ridership growth (7.8 percent) was lower than population growth over the same period. Per capita, passenger boardings increased by about 16 percent.

The period since 2009 has been extremely tumultuous for transit, both in terms of ridership and in terms of provision of service (discussed in greater detail below). Although the statistics compiled in Table 5C.1 are the most recent available that tabulate all operators for fixed route services in the SACOG region, more recent spot data from individual transit operators show dramatic changes in ridership:

- Since fiscal year 2008/2009, Sacramento Regional Transit (RT) has implemented significant service cuts, totaling a 20 percent reduction in service hours over fiscal years 2009–2010 and 2010–2011. Over the same period, total passenger boardings declined by 24 percent. Although some of the decrease in ridership is clearly related to the service cuts, some of the decrease is related to the economic recession, which has decreased the amount of work travel over this period.
- Other operators have not made the same magnitude of cuts to service as RT. Some operators have maintained their service hours and others have made more modest service cuts.

Table 5C.1
Transit Passenger Boardings in the SACOG Region, 2002–2009

	Year							
Variable	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**
Annual Passenger Boardings (in thousands)[1]	32,208	34,647	36,808	37,292	37,596	38,474	39,754	42,744
Weekday Passenger Boardings–Bus[2]	88,600	96,500	96,600	94,700	86,800	89,900	91,200	95,500
Weekday Passenger Boardings–LRT[2]	28,500	29,500	36,700	40,000	48,200	48,300	51,500	57,700
Weekday Passenger Boardings—Total[2]	117,100	126,000	133,300	134,700	135,000	138,200	142,700	153,200
Per Capita Rates								
Population (in thousands)[3]	1,964	2,017	2,068	2,112	2,150	2,184	2,215	2,241
Annual Boardings Per Capita	16.4	17.2	17.8	17.7	17.5	17.6	17.9	19.1

Changes	**'02 to '05**	**'05 to '09**	**'02 to '09**
Passenger Boardings—Bus	+6.9%	+0.8%	+7.8%
Passenger Boardings—LRT	+40.4%	+44.3%	+102.5%
Passenger Boardings—Total	+15.0%	+13.7%	+30.8%
Population	+7.5%	+6.1%	+14.1%
Annual Boardings Per Capita	+7.7%	+8.0%	+16.3%

1 SACOG, "Regional Transportation Monitoring Report", April 2010. Boardings exclude E-Tran, which did not provide data.

2 SACOG, computed from annual boarding using annualization factors.

3 California Dept. of Finance population estimates for six SACOG region counties, adjusted by SACOG to exclude Tahoe Basin portions of Placer and El Dorado counties.

Source: SACOG, September 2011.

Although transit person trips are a better indicator of travel demand by transit, collecting trip-level data is more difficult and less frequently done. On-board passenger surveys which allow for estimates of transit person trips were conducted in 1999 and 2005. Additionally, for commute travel, surveys on mode of commute by workers in the SACOG region are now published annually in the American Community Survey (ACS). Table 5C.2 combines these sources, and provides a tabulation of key historic estimates of transit (and non-motorized) travel in the region:

- From 2000 to 2008, transit commuters increased from about 21,672 to 26,104, a 20.5 percent increase. This increase slightly out-paced the increase in the number of workers counted in the Census and ACS surveys (19.7 percent).The majority of the increase in workers occurred between 2000 and 2005 (17.5 percent). From 2005 to 2008, the number of workers remained nearly flat, increasing by only 1.9 percent. During the same time period, the number of commuters reporting public transit as their primary mode increased by 9 percent.
- Commute transit share increased slightly, from about 2.5 percent in 2000 to 2.6 percent in 2008.
- Transit trips for all purposes (including commute) over the same period increased from about 87,000 in 2000 to about 107,000 in 2008. Although slightly higher than population growth, the overall share of public transit trips for all purposes stayed roughly constant at about 1.2 percent.

Observed Data on Bicycling and Walking

Bike and walk trips also increased in total and as a share of all trips between 2000 and 2008 (see also Table 5C.2).

- The number of commuters reporting bike or walk as their primary mode of commute increased from 29,539 to 36,549 between 2000 and 2008. The share of commuters biking or walking ranged from 3.4 to 3.6 percent, combining a 0.2 percent share increase in biking with a 0.1 percent decrease in walking. It is important to note that both commute and non-commute trips by transit that include walking or biking on either end are logged only as transit trips, so this understates many walking and bicycling trips.
- Although this overall share increase may sound modest, it stems a longer term decline in biking and walking to work—the bike and walk share actually declined from 4.4 percent to 3.4 percent between 1990 and 2000.
- Data on non-commute bike and walk trips is difficult to assemble for the region—estimates are dependent on relatively small sample surveys, model estimates, and anecdotal data. The table shows a significant increase in all-purpose bike and walk share, from about 7.4 to 8.4 percent. It is reasonable to assume that the recent trend in all-purpose biking and walking has been upward, given that commuting shares have increased, and based on other evidence such as the increase in the rate of bicycle-involved accidents (to be discussed in greater detail later).

Table 5C.2
Bike, Walk and Transit Travel in the SACOG Region, 2000 to 2008

Mode of Travel	2000	2005	2008
Commuter Travel[1]			
Public Transit Commuters	21,672	23,938	26,104
Bicycle Commuters	11,107	12,938	14,932
Walk Commuters	18,432	21,373	21,617
Combined Bicycle and Walk Commuters	29,539	34,311	36,549
Total Workers	852,400	1,001,600	1,020,500
Public Transit Share	2.5%	2.4%	2.6%
Bicycle Share	1.3%	1.3%	1.5%
Walk Share	2.2%	2.1%	2.1%
Combined Bicycle and Walk Share	3.5%	3.4%	3.6%
All Travel			
Public Transit Trips[2]	87,200	103,000	107,000
Bicycle Trips[3]	113,400	129,000	155,600
Walk Trips[3]	429,300	488,500	574,300
Total Person Trips (in thousands)	7,378	8,395	8,685
Public Transit Share	1.2%	1.2%	1.2%
Bicycle Share	1.5%	1.5%	1.8%
Walk Share	5.8%	5.8%	6.6%
Combined Bicycle and Walk Share	7.4%	7.4%	8.4%

[1] SACOG, April, 2010, based on data from the Year 2000 Decennial Census, and the American Community Survey 3-year sample data releases for 2005 and 2008. Data shown are 6-county totals, including Tahoe Basin.

[2] SACOG On Board Transit surveys for 1999 and 2005, interpolated to 2000 and 2008 based on boardings data from operators.

[3] SACOG estimates based on Year 2000 household travel survey, and SACSIM travel demand model for Year 2005 and 2008.

Source: SACOG, September 2011.

MTP/SCS Changes To The Transit System

As described more fully in Chapter 4, the MTP/SCS doubles total fixed-route transit service compared to 2008. The plan includes a 98 percent increase in total daily vehicle service hours and calls for 53 percent of all transit services (bus and rail) to operate 15-minute or better service by 2035, up from 24 percent today.

The MTP/SCS focuses transit investments especially in areas most capable of supporting robust transit service. Combining significant housing and employment growth in Transit Priority Areas (TPAs) with high-frequency service of 15 minutes or better in these areas allows the MTP/SCS to provide quality transit service to higher concentrations of people where it is most cost-effective. By 2035, nearly 400,000 homes and over 600,000 employees will be located within TPAs, increasing the potential number and desirability of daily trips made by transit.

The workshop scenarios (Appendix G-1—Public Workshop Scenarios and Workshop Results) developed by SACOG identified several factors which guided the development of the MTP/SCS transit network:

- Population and Job Density—higher density corridors support more frequent transit service.
- Mix of use—corridors with a mix of complementary land uses support use of transit during off-peak periods, especially midday and evening.
- Income Demographics—corridors with higher concentrations of lower income households generate higher demand for transit service.
- Block Size/Street Pattern—areas where the street pattern supports walking also support walk access to transit.
- Access to Job Centers—locations with concentrations of employment generate potential for peak/commuter transit. Job centers where parking is normally paid out of pocket generate the highest levels of transit, carpooling, and non-auto modes of commute.
- In addition to these primarily land use criteria, roadway improvements (including construction of new roadways, and widening or reconstruction of existing roadways) will consider the utility of the roadway to multiple users, including vehicle drivers and passengers, transit vehicles, transit passengers, pedestrians, bicyclists, and commercial vehicles. This more expansive look at roadway improvements is part of SACOG's Complete Streets policy.

Figure 5C.3 shows the MTP/SCS transit network. The figure shows land use colored according to mix/density, as follows: Yellow land uses are predominantly residential; blue land uses are predominantly employment; green land uses are mixed areas. The darkness of the color indicates the total density (i.e., dwellings + jobs per acre). The MTP/SCS transit network focuses the most frequent, highest capacity transit services in corridors where density is the highest. Peak-oriented services (i.e., express or commuter buses), are located where predominantly residential areas connect to major employment centers. All-day services are focused where mixed uses are more prevalent.

Although income demographics are not shown in Figure 5C.3, MTP/SCS transit services are more concentrated in areas where lower income households are more prevalent. This issue will be discussed in greater detail in Chapter 8, Equity and Choice.

Figure 5C.3

2035 Transit and Land Use

SACOG 2011

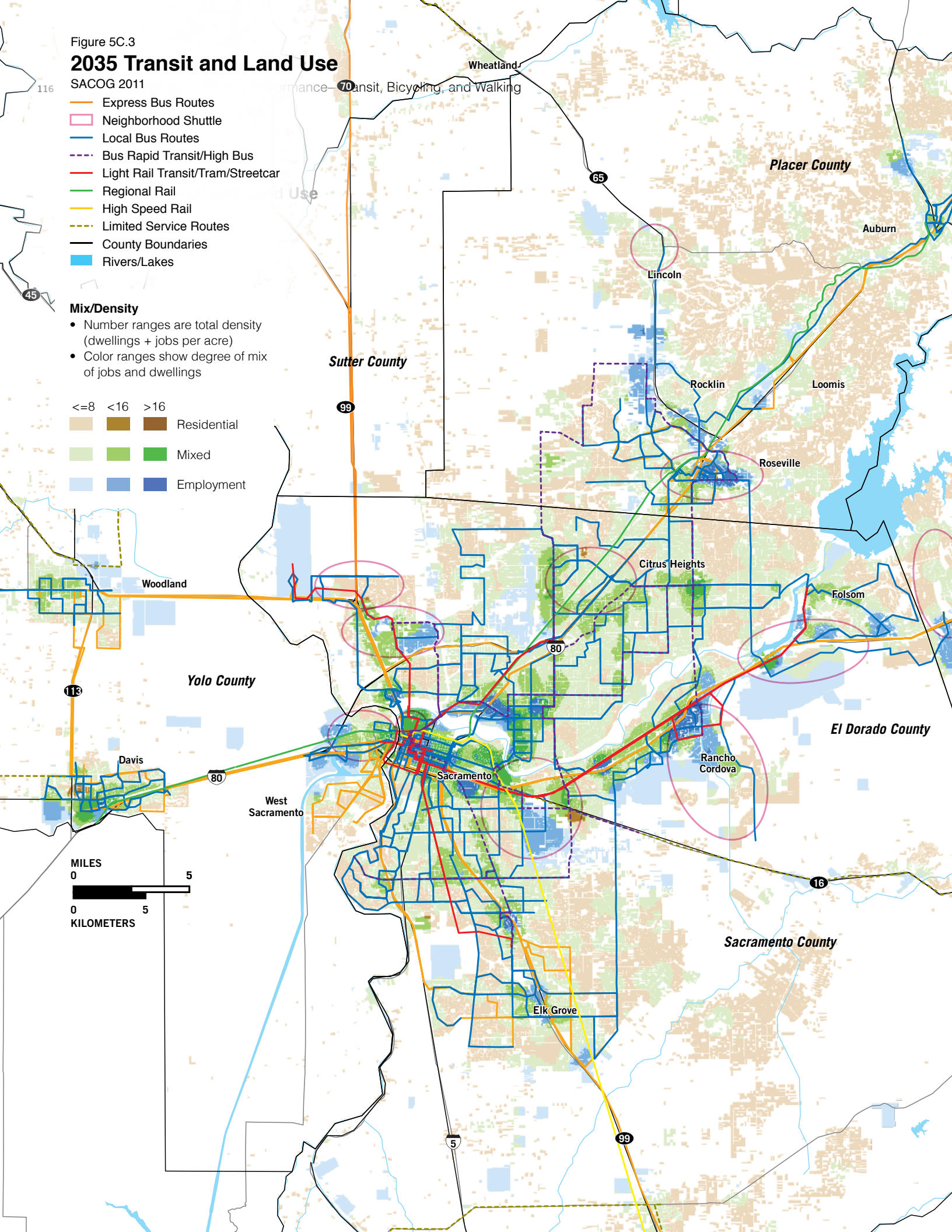
- Express Bus Routes
- Neighborhood Shuttle
- Local Bus Routes
- Bus Rapid Transit/High Bus
- Light Rail Transit/Tram/Streetcar
- Regional Rail
- High Speed Rail
- Limited Service Routes
- County Boundaries
- Rivers/Lakes

Mix/Density

- Number ranges are total density (dwellings + jobs per acre)
- Color ranges show degree of mix of jobs and dwellings

<=8	<16	>16	
			Residential
			Mixed
			Employment

MILES
0 5
0 5
KILOMETERS



The MTP/SCS doubles total general, or non-demand-responsive, transit service (i.e., light rail, streetcar/tram, regional rail, express bus, fixed route bus, bus rapid transit, and community shuttle) compared to the 2008 base year. The MTP/SCS also adds to the region service types which were not present in 2008: streetcar/tram (in downtown Sacramento and Rancho Cordova), bus rapid transit (in several corridors in Sacramento and Placer counties), and community shuttles (in all counties).

Table 5C.3 provides a tally of transit services included in the MTP/SCS. The table shows weekday vehicle service hours, split by transit service types, described below:

- **Light Rail** is designed for operating in urban environments, with passenger rail cars operating up to four two-car consists, on fixed rails in a right-of-way exclusive in some locations, or mixed with street vehicle traffic in others. Light rail vehicles (LRVs) are typically driven electrically with power being drawn from an overhead electric line. RT operates the only light rail service within the MTP/SCS Plan Area. Generally, LRT operates with stations spaced one-half mile or more apart, and with maximum running speeds of about 55 miles per hour.
- **Streetcar or Tram** is another form of urban rail transit service, similar in some ways to LRT. Streetcar vehicles are typically shorter and narrower than light rail cars. Streetcars may be older cars that are refurbished (vintage trolley cars) or newer cars built to look like older cars (heritage trolley cars), or they may be modern LRV-type vehicles of smaller dimensions. Similar to LRT, they are generally operated on rails with steel wheel traction; capable of operating either within the roadway and mixed with vehicle traffic, or on exclusive right-of-way; and are operated with fixed stops and schedules. Characteristics which distinguish streetcar or tram from LRT are that streetcars or trams generally have closer station/stop spacing, usually less than one-half mile; slower running speeds; shorter train consists (more singles and doubles than four-car trains); and are more likely to run in roadways and be mixed with vehicle traffic. This service type is well described and illustrated in the recently published Sacramento Regional Transit District Transit Action Master Plan.[2]
- **Bus Rapid Transit (BRT)** is a type of limited-stop bus service developed in the 1990s that relies on technology to help speed up the service and enhance passenger convenience and comfort. Limited-stop service is a hybrid between local and express service, where the stops may be several blocks to a mile or more apart to speed up the trip. BRT can operate on exclusive transitways, high-occupancy-vehicle (HOV) lanes, expressways, or ordinary streets. A BRT line combines intelligent transportation systems technology, priority for transit, rapid and convenient fare collection, and integration with land use policy in order to upgrade bus system performance substantially.
- **Express Bus** service serves longer trips, especially in major metropolitan areas during peak commuting hours. Express buses usually travel significant portions of their total route length on highways and freeways with relatively long closed-door distances (i.e., no passengers boarding or alighting). In most cases, express buses are inbound-only in the morning peak, and outbound-only in the evening peak. Several transit operators within the MTP/SCS Plan Area currently operate express service for commuters.
- **Fixed Route Bus (or Local Bus)** service is provided using buses on a fixed schedule along fixed routes. Stop spacing can vary widely from quarter-mile-or-less in urban areas, to one-mile-or-more in lower density settings. This is the most common type of bus service in the Plan Area designed to deliver and pick up transit passengers at specific locations as close to their destinations or origins as possible.
- **Regional Rail** is a proposed commuter-oriented heavy rail service operating within the region, in concert with the existing Amtrak-operated Capitol Corridor intercity rail service. Regional rail would provide additional trains between Auburn, Roseville, Sacramento, and Davis, with potential connections extending into the San Francisco Bay Area counties.
- **Community Shuttles** provide transit service limited to small geographic areas or short-distance trips and are often called circulator, feeder, neighborhood, trolley, or shuttle services. Such routes, which may have a lower fare than local fixed route service, frequently operate in a loop and connect to major destinations or routes for travel to more outlying destinations. Community shuttles are currently provided by the Sacramento Regional Transit District, Sacramento State University and the North Natomas Transportation Management Association. Some additional privately operated shuttles may be available throughout the MTP/SCS Plan Area as well.

As shown in Table 5C.3, transit service increases significantly in the MTP/SCS. Total service nearly doubles from 4,074 hours per day to 8,062 hours by 2035. On a per capita basis, service increases by 42 percent by 2035.

The early years of MTP/SCS implementation are challenging for transit. The state and federal funding environment for transit capital and operations is still uncertain, which will likely lead transit operators to exercise caution in restoring or adding service until funding levels are more assured. To be successful, transit-oriented development in TPAs (discussed in more detail in Chapter 3) requires

[2] Sacramento Regional Transit District *TransitAction* Regional Transit Master Plan. Available at: http://www.sacrt.com/documents/transitaction/Executive%20Summary.pdf

high-quality transit service, but that level of service can be inefficient until sufficient development is in place. The region must, therefore, plan and time its transportation system investments strategically to address this interrelationship. Worthy of note in Table 5C.3 is the decline by 6 percent in transit service hours per capita between 2008 and 2020. This decline is a product of the dramatic cuts to transit service between 2008 and 2011, and building back transit service between 2011 and 2020.

Table 5C.3
MTP/SCS Changes to Transit Service in the SACOG Region

Transit Service Type	2008	2020 MTP/SCS	2035 MTP/SCS
Vehicle Service Hours			
Light Rail	248	301	429
Tram/Streetcar	0	15	145
Express Bus	221	201	286
BRT/Fixed Route Bus	3,595	3,781	6,416
Shuttle	0	29	758
Regional Rail	10	20	29
All Types	4,074	4,347	8,062
Population	2,215,000	2,519,900	3,086,200
Service Hours Per Capita (x 1000)	1.8	1.7	2.6
Changes from 2008			
Light Rail	n/a	+21%	+73%
Tram/Streetcar	n/a	n/a	n/a
Express Bus	n/a	-9%	+30%
BRT/Fixed Route Bus	n/a	+5%	+78%
Shuttle	n/a	n/a	n/a
Regional Rail	n/a	+100%	+186%
All Types	n/a	+7%	+98%
Popuation	n/a	+14%	+39%
Service Hours Per Capita (x 1000)	n/a	-6%	+42%

Source: SACOG, September 2011.

MTP/SCS Changes to the Non-Motorized Transportation System

The MTP/SCS provides $2.8 billion ($4.0 billion YOE) for bicycle and pedestrian improvements, and assumes that another nearly $600 million, or about 5 percent of the road maintenance and rehabilitation budget, will also be spent on bicycles and pedestrians as part of major rehabilitation projects.

The MTP/SCS envisions a larger and more complete bicycle and pedestrian network that will provide greater mobility through walking and biking and associated transit use. It contains:

- 58 percent more miles of bicycle trails and 29 percent more miles of bicycle lanes than the last MTP;
- Road investments that include bicycle and pedestrian components such as striping and signage, sidewalk gap closures, ADA retrofits, and intersection improvements; and
- An emphasis on complete street connections within and between cities and to transit and school facilities.

In addition to funding for bicycle projects and programs throughout the region, SACOG strongly encourages complete streets. Complete streets provide infrastructure and account for all users of the roadway, including motorists, pedestrians, bicyclists, and transit riders. SACOG has developed a Complete Streets Resource Toolkit, available at www.sacog.org/complete, to help member agencies and members of the public understand, design, and implement complete streets.

SACOG also provided funding to the Sacramento Metropolitan Air Quality Management District, who partnered with the Sacramento Area Bicycle Advocates to install 1,000 bicycle racks at businesses throughout the region. Many employers in the region now offer bicycles for employees and clients to use for travel, and in June 2011, the Sacramento Midtown Business Association began a modest bike share program.

Bicycle and pedestrian facilities are often built by local agencies as part of other capital projects. Many road projects are not classified specifically as bicycle and pedestrian facility projects because they serve multiple purposes, such as moving utilities underground or adding shoulders for motor vehicle safety, and are funded within other programs. For example, bicycle and pedestrian paths can be included in recreation, public health, or transit budgets, developer impact fee programs, or the state's Safe Routes to Schools program.

Developers of new areas are also expected to provide high quality bicycle and pedestrian facilities as part of the basic public infrastructure. However, good connections can be frustrated by cul-de-sacs and gated or walled neighborhoods. Creating cut-throughs and other connections are a priority in the Regional Bicycle, Pedestrian, and Trails Master Plan, adopted in June 2011.

The Transportation Framework used to guide the development of the MTP/SCS transportation system (Appendix G-1) identified implementation of complete streets policies as a primary way of making significant improvements to the region's non-motorized (pedestrian and bicycle) system. These policies would affect the planning, design and implementation of all types of roadway projects, and, where feasible and warranted, would include project components focused on serving pedestrians and bicyclists as part of roadway improvement projects (e.g., construction of new roadways, widening or reconstruction of existing roadways, and remodeling or road diet projects on existing roadways).

Additional options for making improvements are stand-alone bicycle or pedestrian improvement projects. Examples of stand-alone projects include: construction of new Class 1 bicycle paths, expansion of the Class 2 bicycle lane system, and construction of pedestrian bridges and other gap closure projects dedicated to pedestrians. This could include packages of small-scale improvements to be included in implementation of the Safe Routes to Schools program within the region.

Table 5C.4 provides a tabulation of the estimate of bicycle route mileage of different types included in the MTP/SCS.

- Class 1 routes are exclusively for the use of bicycles and pedestrians. An example of a Class 1 facility in the region is the American River Parkway bicycle trail.
- Class 2 routes are painted bike lanes on roadways that also accommodate private vehicles, transit vehicles, and commercial vehicles in the marked vehicle lanes, and pedestrians and transit passengers on adjacent sidewalks.

The MTP/SCS would double the route mileage of Class 1 facilities and increase Class 2 facilities by nearly 70 percent. On a per capita basis, Class 1 route mileage, which was about 17.9 mile per 100,000 residents in 2008, would increase by 44 percent to nearly 25.8 miles per 100,000 residents. Class 2 miles per capita would increase by 10 miles per 100,000 residents over the plan period. In total, combined Class 1 and Class 2 route mileage would increase by about 27 percent, from 65.7 to 83.6 miles per 100,000 residents, over the plan period. A few examples of projects are:

- a new Class 1 route connecting El Dorado County through the City of Folsom and to the American River Parkway system;
- a new Class 1 route and bridge in the City of Sacramento connecting Curtis Park to Sacramento City College, over the Union Pacific railroad main line and RT light rail Blue Line;
- conversion of abandoned railroad right-of-way in Yuba City and Sutter County, connecting to the 5th Street Bridge; and
- a new Class 1 route connecting Oakridge to Riverside in the City of Roseville, including a new crossing of I-80.

Table 5C.4
Bike Route Mileage in the MTP/SCS

County	Class 1	Class 2	Both Classes
Total Miles in 2008[1]			
El Dorado[2]	14	20	34
Placer[2]	53	214	267
Sacramento	244	587	831
Sutter	11	41	52
Yolo	66	165	231
Yuba	9	32	41
Region	397	1,059	1,456
Miles Per 100k Population	17.9	47.8	65.7
Total Miles in 2035[3]			
El Dorado[2]	56	201	257
Placer[2]	134	262	396
Sacramento	417	806	1,223
Sutter	25	64	89
Yolo	127	274	401
Yuba	34	174	208
Region	793	1,781	2,574
Miles Per 100k Population	25.8	57.8	83.6
Change from 2008			
El Dorado[2]	+300%	+905%	+656%
Placer[2]	+153%	+22%	+48%
Sacramento	+71%	+37%	+47%
Sutter	+127%	+56%	+71%
Yolo	+92%	+66%	+74%
Yuba	+278%	+444%	+407%
Region	+100%	+68%	+77%
Miles Per 100k Population	+44%	+21%	+27%

1 2008 route mileage from SACOG's regional GIS centerline data.

2 El Dorado and Placer Counties exclude the Tahoe Basin portions.

3 Estimates of 2035 MTP/SCS are based on explicitly identified bicycle lane projects, plus an estimate of currently adopted bicycle master plans which may be funded or implemented through other transportation projects, or as stand-alone projects.

Source: SACOG, September 2011.

Shifts in Transit and Non-Motorized Travel

Table 5C.5 and Figures 5C.4 through 5C.7 provide tabulations and illustrations of transit and non-motorized travel projections for the MTP/SCS. The projections take account of all of the investments and policies outlined above for implementation of the MTP/SCS.

- Transit person trips are projected to increase from about 110,000 in 2008 to 390,000 by 2035 for the MTP/SCS, an increase of about 255 percent in total. This compares to an increase of about 197 percent from the 2008 MTP.
- Weekday transit trips per capita for the MTP/SCS increase by 2035 to 0.13 trips/day, compared to 0.05 trips per capita in 2008. Compared to the 0.10 transit trips per capita in the 2008 MTP, the MTP/SCS is 30 percent higher.
- Bicycle person trips are projected to increase from 152,000 in 2008 to 229,000 by 2035 for the MTP/SCS, an increase of about 50 percent in total. Walk person trips increase from 627,000 to about 1,024,000, an increase of 64 percent.
- Although the total increase in bicycle and walk person trips projected by 2035 for the MTP/SCS is comparable to the 2008 MTP (see Table 5C.5), MTP/SCS population growth is lower than the 2008 MTP, so the per capita rates of non-motorized trip making are higher overall for the MTP/SCS. Bicycle and walk trips combined increase from 0.35 weekday trips per capita in 2008 to 0.40 trips per capita by 2035 for the MTP/SCS, compared to 0.34 trips per capita for the 2008 MTP. The MTP/SCS is about 16 percent higher in non-motorized trips per capita than the 2008 MTP.

Table 5C.5
Transit, Bicycle and Walk Travel in the SACOG Region, 2008 and MTP/SCS

Mode of Travel	2008	2035 MTP/SCS	2035–from 2008 MTP[2]
Weekday Person Trips by Mode[1]			
Transit Trips	110,200	391,900	326,700
Bicycle Trips	152,300	228,800	1,125,600[3]
Walk Trips	626,700	1,024,200	
Total Trips	889,200	1,644,900	1,452,300
Per Capita Rates			
Population	2,215,000	3,086,200	3,348,000
Transit Trips	0.05	0.13	0.10
Bicycle Trips	0.07	0.07	0.34[3]
Walk Trips	0.28	0.33	
Total Trips	0.40	0.53	0.43
Percent Changes in Non-Private Vehicle Trips Per Capita			
From 2008			
Transit Trips	n/a	+155.2%	+96.1%
Bicycle Trips	n/a	+7.8%	-4.4%[3]
Walk Trips	n/a	+17.3%	
Total T/Bk/Wk Trips	n/a	+32.8%	+8.1%
From 2008 MTP			
Transit Trips	n/a	+30.1%	n/a
Bicycle Trips	n/a	+20.8%[3]	n/a
Walk Trips	n/a		n/a
Total Transit/Bike/Walk Trips	n/a	+22.9%	n/a

[1] Estimates of weekday person trips by mode from SACSIM regional travel demand model.

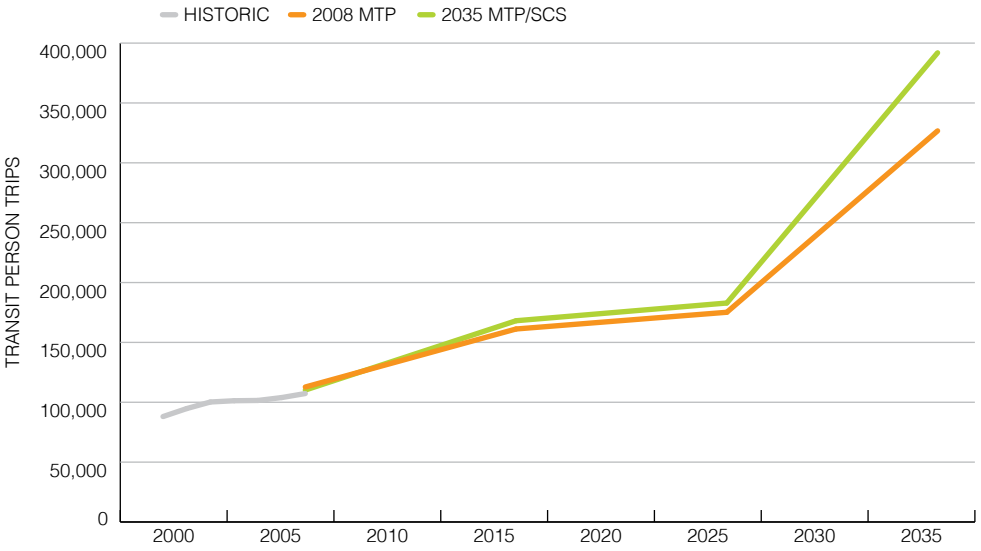
[2] SACOG, 2008 MTP, A Creative New Vision for Transportation in the Sacramento Region, April 2008.

[3] Commercial and external travel was combined in the 2008 MTP document.

Source: SACOG, September 2011.

Figure 5C.4

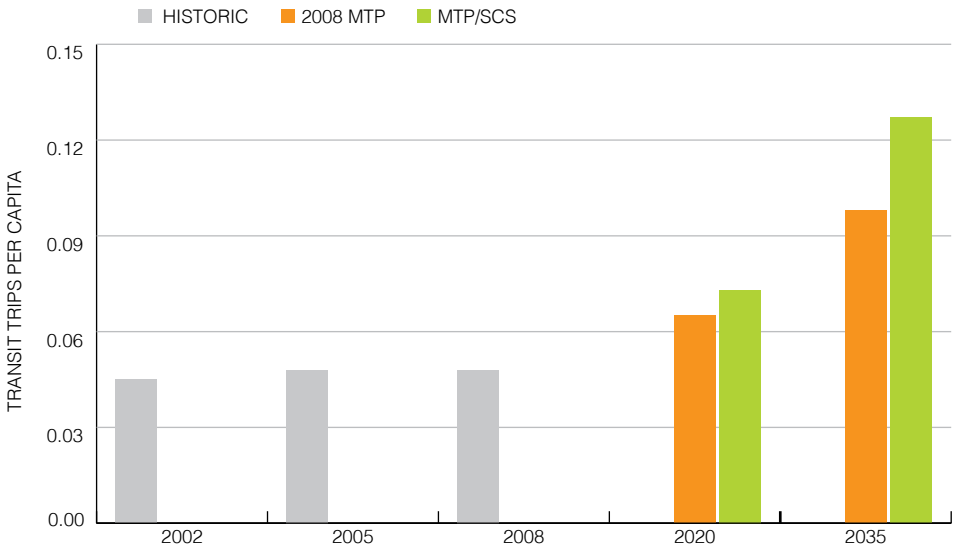
Total Transit Person Trips in the SACOG Region, Historic Trends and Projected MTP/SCS



Source: SACOG, September 2011.

Figure 5C.5

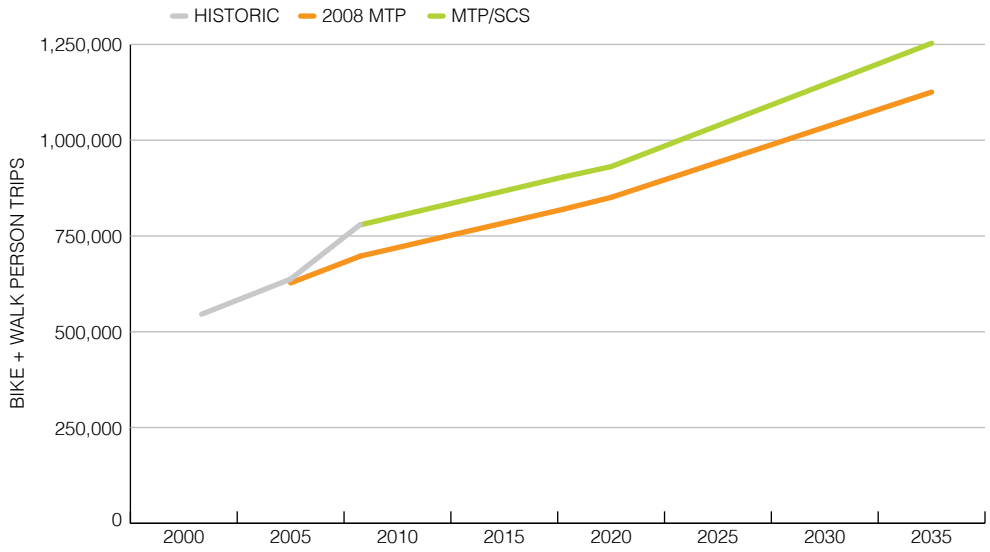
Transit Person Trips Per Capita in the SACOG Region, Historic Trends and Projected MTP/SCS



Source: SACOG, September 2011.

Figure 5C.6

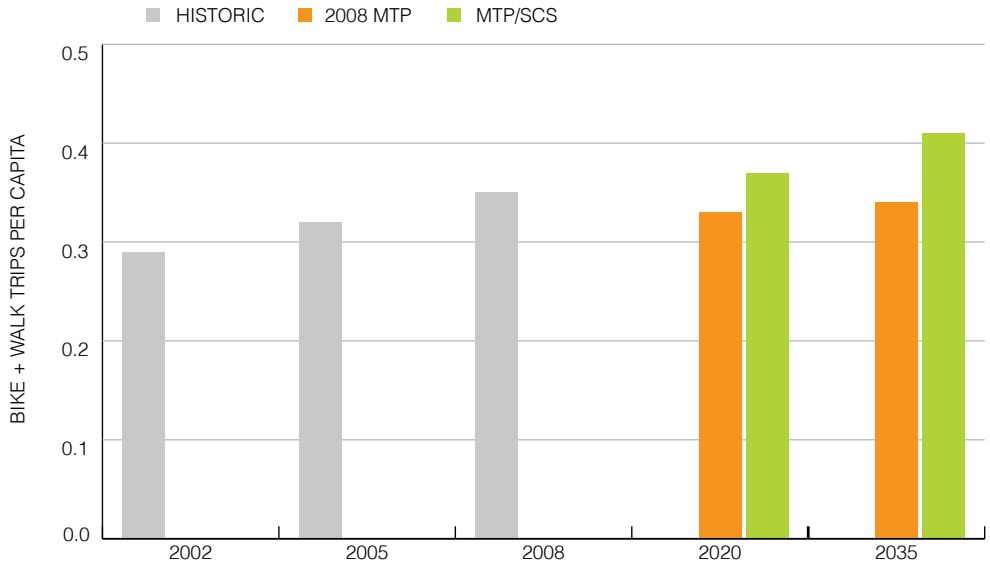
Total Bike and Walk Person Trips in the SACOG Region, Historic Trends and Projected MTP/SCS



Source: SACOG, September 2011.

Figure 5C.7

Bike and Walk Person Trips Per Capita in the SACOG Region, Historic Trends and Projected MTP/SCS



Source: SACOG, September 2011.

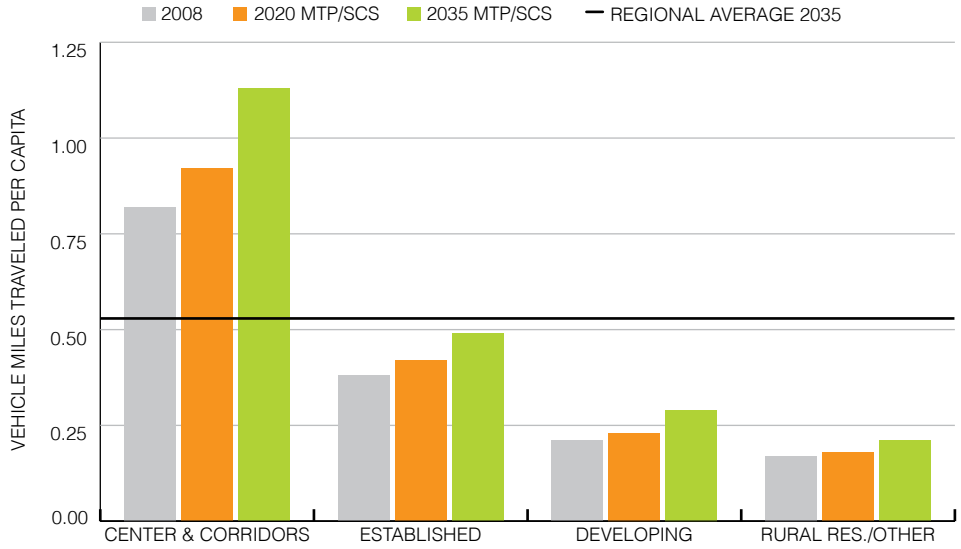
Transit, Bike and Walk Travel by Community Type

Figure 5C.8 illustrates differences in combined transit/bike/walk trip-making for residents of different Community Types by 2035.

- For residents of Center and Corridor Communities, combined transit/bike/walk trip-making is 1.13 weekday trips per capita, more than twice the regional average of 0.53 trips per capita.
- For residents of Established Communities, transit/bike/walk trips per capita (0.49) are slightly below the regional average of 0.53.
- For all other Community Types, transit/bike/walk trips per capita are less than one-half the regional average.
- For all Community Types, combined transit/bike/walk trip-making increases through the MTP/SCS planning period. As expected, changes from 2008 to 2020 are much smaller than changes to 2035. In general, about one-third of the 2008 to 2035 increase is projected to occur by 2020, with the remaining two-thirds occurring between 2020 and 2035.

Figure 5C.8

Transit, Bike and Walk Trips Per Capita by Community Type in the SACOG Region



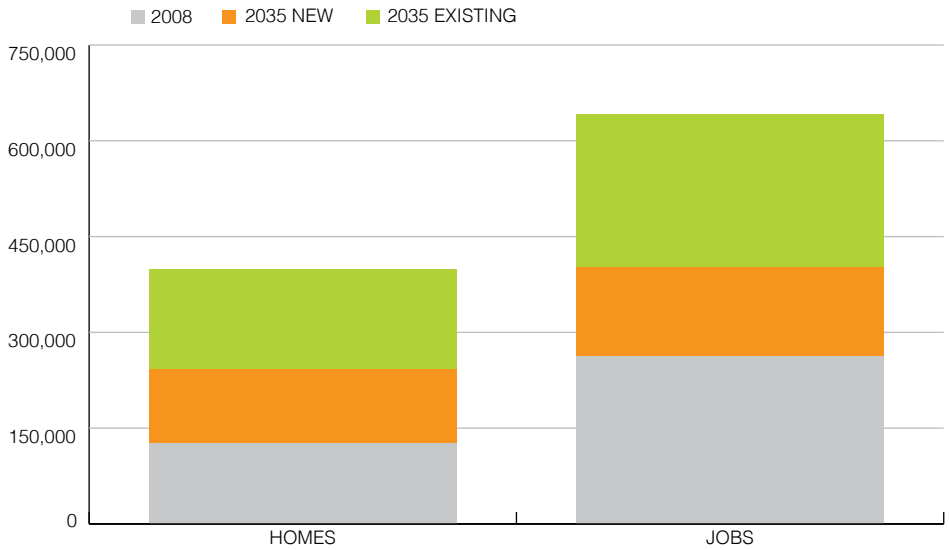
Source: SACOG, September 2011.

As discussed in more detail in Chapter 3, the MTP/SCS projects significant growth in housing and employment in TPAs, shown in Figure 5C.9.

Figure 5C.9

Housing and Employment within Transit Priority Areas, 2008–2035

2035 Existing represents additional existing homes and jobs that gain proximity to high-quality transit through service additions.



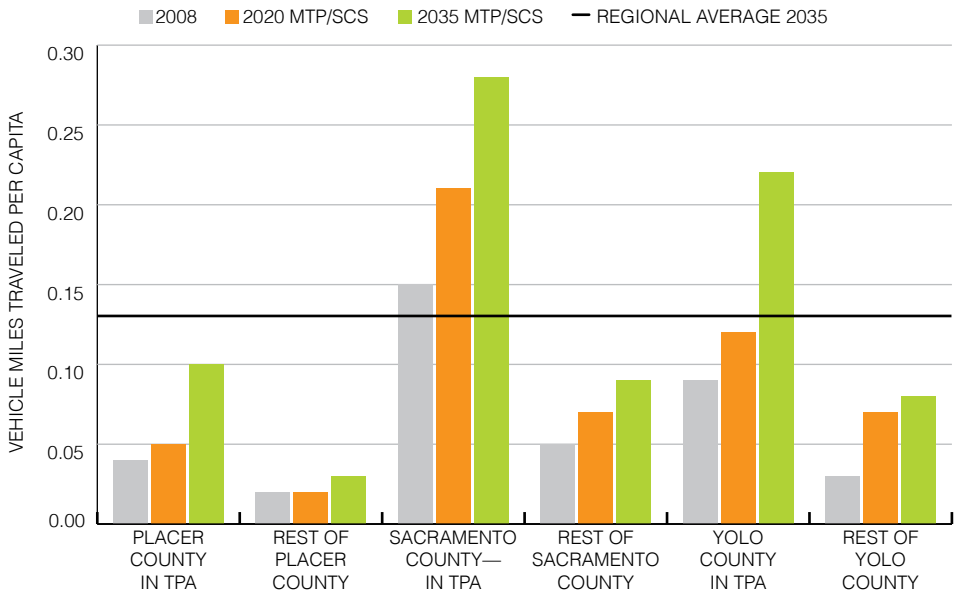
Source: SACOG, September 2011.

Figure 5C.10 provides a tabulation of transit person trips per capita, split by residents in TPAs and all other non-TPA areas within Placer, Sacramento and Yolo Counties.

- Residents within TPAs make transit trips at two- to three- times the rate of residents in non-TPA areas. For example: In the Sacramento County TPAs, residents are forecasted to make 0.28 person trips per capita by 2035, compared to 0.09 transit trips per capita for residents of non-TPA areas, a difference of 222 percent.
- Transit trips per capita increase for both residents of TPA and non-TPA areas in the MTP/SCS. In Placer County, the increase is 118 percent for residents in TPA areas within the county, and 109 percent for residents of other areas within the county. For Yolo County, the percentage increase in transit trips per capita is higher for residents in the non-TPA areas (146 percent) than for TPA residents (127 percent), but trip-making rates in the TPAs are much higher: 0.22 transit trips per day by 2035 for TPA residents in Yolo County, compared to 0.08 for non-TPA residents in the county.

Figure 5C.10

Transit Trips Per Capita by Transit Priority Areas in the SACOG Region



Source: SACOG, September 2011.

Commute Travel by Transit and Non-Motorized Modes

Commute travel represents a significant share of total travel—for example, 41 percent or more of all household-generated VMT by 2035 will be commute-related (see Table 5B.3 in Chapter 5B). Historically, though, commute travel has been less varied in terms of mode of travel than travel for other purposes. The rate of driving alone for commuting is far higher than for all other travel, and the rates of biking and walking to work are far lower than the same rates for non-work purposes: in 2008, 76 percent of all commuters drove alone, while only about 30 percent of non-commute travelers drove alone (see Tables 5C.6 and 5C.7).

The MTP/SCS significantly reduces the commute drive-alone share by offering better alternatives to solo driving (Table 5C.6) as a result of the MTP/SCS:

- Transit mode share increases from 2.8 percent in 2008 to 8.2 percent by 2035 (compared to 7.2 percent for the 2008 MTP).
- Bike and walk share increases from 3.2 percent in 2008 to 3.8 percent by 2035 (compared to 3.7 percent for the 2008 MTP).
- Carpool mode share remains flat at 14.7 percent—however, this represents a change from the historic decline in this mode of commuting.

Table 5C.6
Mode of Commute Travel for SACOG Region, 2008 and MTP/SCS

Mode of Commute	2008	2035 MTP/SCS	2035—from 2008 MTP [2]
Weekday Commute Tours[1]			
Drive Alone	519,400	641,500	845,300
Carpool	99,900	133,700	173,200
Transit	18,900	74,600	85,200
Bike	8,800	14,400	20,600
Walk	12,600	20,100	24,000
Work at Home[3]	20,100	27,100	36,700
Total	**679,700**	**911,400**	**1,185,000**
Commute Mode Share			
Drive Alone	76.4%	70.4%	71.3%
Carpool	14.7%	14.7%	14.6%
Transit	2.8%	8.2%	7.2%
Bike	1.3%	1.6%	1.7%
Walk	1.9%	2.2%	2.0%
Work at Home[3]	3.0%	3.0%	3.1%
Total	**100.0%**	**100.0%**	**100.0%**

[1] Commute tours combine all trips from home to work and back to home into one unit. Tours are roughly equivalent to commute round trips.

[2] Adapted from forecasts in SACOG 2008 MTP, A Creative New Vision for Transportation in the Sacramento Region, April 2008.

[3] Share of workers with usual workplace at home is approximately two times higher than reported. This table also reflects work travel away from home for workers whose workplace is at home.

Source: SACOG, September 2011.

Table 5C.7
Mode of Travel for All Non-Commute Trips for SACOG Region, 2008 and MTP/SCS

Mode of Travel	2008	2035 MTP/SCS	2035—from 2008 MTP[2]
Weekday Non-Commute Person Trips[1]			
Drive Alone	2,533,400	3,316,200	9,566,200[4]
Carpool	3,427,300	4,921,800	
Transit	56,700	176,700	150,600
Bike	131,700	194,800	949,700[4]
Walk	596,600	976,000	
Other[3]	102,100	125,300	97,000
Total	**6,847,800**	**9,710,800**	**10,763,500**
Non-Commute Person Trip Mode Share			
Drive Alone	37.0%	34.1%	88.9%[4]
Carpool	50.0%	50.7%	
Transit	0.8%	1.8%	1.4%
Bike	1.9%	2.0%	8.8%[4]
Walk	8.7%	10.1%	
Other[3]	1.5%	1.3%	0.9%
Total	**100.0%**	**100.0%**	**100.0%**

1 Includes person trips for school, shopping, personal business, and all non-work trip purposes.

2 Adapted from forecasts in SACOG, 2008 MTP, A Creative New Vision for Transportation in the Sacramento Region, April 2008.

3 Primarily school bus.

4 Drive alone+carpool modes, and bike+walk modes, were combined in the 2008 MTP document.

Source: SACOG, September 2011.

Key Factors Influencing Increasing Transit and Non-Motorized Travel

Three of the most important factors in increasing transit use, bicycling and walking are:

- Improvements in Mix of Land Uses—Most areas within the region improve to some degree in the balance of complementary land uses (see Table 5A.2 in Chapter 5A). This allows for a higher share of wants and needs to be met closer to a place of residence, which in turn allows for shortening of vehicle trips and creates more opportunities for non-motorized travel.
- Improvements to Transit Service—The overall increase in transit service (nearly doubling in total, and increasing by 42 percent on a per capita basis) plus the reduction in distance to the nearest transit station/stop (0.72 miles to 0.55 miles) play a big part in the increase in transit mode share. Additionally, the fact that transit service was added in areas with good supporting land uses magnifies the effects of the additional services.
- Improvements in Bicycle System—The overall increase in Class 1 and Class 2 bike route mileage means that options for bicycling are expanded relative to 2008. The selection of bike route projects in the MTP/SCS which fill in key gaps and provide new connections also magnifies their effects on increasing bicycle ridership.
- Improvements to Street Pattern and Walkability—Intersection density (the main generic indicator of street pattern used in land use /transportation research) declines slightly, on average (see Table 5A.2 in Chapter 5A). However, many projects in the MTP/SCS that do not affect street pattern will also have an impact on walkability. Many complete streets projects include pedestrian or bicycle enhancements that make walking and biking more attractive.

In addition to these policy-based factors, the following external factors influence the rates of transit, biking and walking to some degree: aging of the population, which is likely to reduce the overall rate of bicycling and walking for travel; and assumed increases in auto operating costs, driven by higher fuel prices expected in the future, that make non-auto modes more attractive relative to driving.

Transit System Productivity

Although system efficiency and productivity have always been goals of transportation planning and project delivery, the recent precipitous declines in public revenues to support public transit have put a much higher level of emphasis and concern on how well utilized are the transit investments in the MTP/SCS. This section describes the increases in the productivity of the transit system resulting from the MTP/SCS, while Chapter 10 on Financial Stewardship discusses in more detail the issues with transit operations and capital funding.

For transit, overall system productivity is usually measured by the passenger boardings per service hour provided. The more productive a route or system is, the more passengers will board per unit of service provided. This is the most commonly used productivity-tracking metric in the transit industry, and is routinely computed by most transit operators.

System productivity is a good basic measure of the relative benefit provided by a transit investment. All other things being equal, higher system productivity indicates a more efficient system. However, this measure should not be confused with a full-blown cost-effectiveness measure. In order to determine that the MTP/SCS transit is the most cost-effective set of investments, costs of delivering transit service would need to be included in the calculation, as well as valuations of benefit of transit passenger boardings. Finally, cost-effectiveness requires comparison to other potential ways of delivering transportation benefits, either other forms of transit or other modes of travel.

Observed Data and Historic Trends in Transit Productivity

Table 5C.8 provides transit service, ridership and productivity data for operators of any fixed route or fixed schedule transit service over the eight years from mid-2001 to mid-2009, when:

- Total vehicle service hours increased 32.5 percent over the period. Light rail transit (LRT) service hours more than doubled, and bus service hours increased by 24 percent. One-third of the total increase in service hours was accounted for by LRT.
- Total passenger boardings increased by 37 percent, slightly outpacing the increase in service hours. LRT boardings increased by 103 percent, and bus boardings by 13 percent. Three-quarters of the increase in boardings were accounted for by LRT.
- Boardings per service hour increased by only 3.2 percent over the period.
- Two significant year-over-year changes are worthy of note:
  - During FY 2003/04 and FY 2004/05, the South Line Phase 1 (to Meadowview) and Sunrise LRT

extensions opened, increasing LRT service hours by 86.5 percent from FY 2002/03. LRT boardings increased by only 36.5 percent, resulting in a 27.3 percent drop in LRT boardings per service hour (from 83.8 in FY 2002/03 to 60.9 by FY 2004/05). Between FY 2004/05 and FY 2008/09, though, ridership on the two extensions, plus the extension of service to the City of Folsom, developed and LRT boardings per service hour returned to 81.2.

- Between FY 2007/08 and FY 2008/09, the first rounds of service cuts began, with a 2.5 percent reduction. Over the same years, ridership increased by 7.6 percent, in part due to the spiking of gasoline prices. These combined changes resulted in the largest year-over-year increase in transit productivity over this period: an increase from 30.9 to 34.1 boardings per service hour, or 10.4 percent.

Regional data for FY 2009/10 and FY 2010/11 have not been assembled. However, data from selected operators are available.

- At Sacramento Regional Transit District (RT), the combination of the initial rounds of service cuts, plus a spike in transit ridership related in part to the historic increases in gasoline prices, resulted in a significant increase in boarding per service hour in FY 2008/09. Since that time, both service and ridership have declined. Deep service cuts were made in FY 2010/11, and the weakening regional economy, combined with the effects of the service cuts, resulted in a drop in ridership. In combination, overall productivity had declined slightly since FY 2008/09.
- For other transit operators, both changes in the amount of service provided and ridership changes since FY 2008/09 have been far more modest than those experienced at RT, and transit productivity has changed very little since then.

Table 5C.8

Transit Service and Productivity in SACOG Region, 2001 to 2008

	Fiscal Year							
Variable	**2001/02**	**2002/03**	**2003/04**	**2004/05**	**2005/06**	**2006/07**	**2007/08**	**2008/09**
Vehicle Service Hours (annual, in thousands)								
Light Rail Transit[1]	104	106	150*	197*	209	210	216	213
All Bus[2]	871	895	998	1,074	1,075	1,105	1,110	1,079
Region-wide	975	1,000	1,148	1,271	1,284	1,314	1,326**	1,293**
Passenger Boardings (annual, in thousands)								
Light Rail Transit[1]	8,541	8,859	11,022*	12,009*	14,452	14,490	15,455	17,315
All Bus[2]	23,666	25,787	25,786	25,518	23,858	24,938	25,496	26,742
Region-wide	32,208	34,647	36,808	37,527	38,311	39,428	40,951**	44,057**
Passenger Boardings Per Service Hour								
Light Rail Transit[1]	82.4	83.8	73.6*	60.9*	69.2	69.1	71.6	81.2
All Bus[2]	27.2	28.8	25.8	23.8	22.2	22.6	23.0	24.8
Region-wide	33.0	34.6	32.1	29.5	29.8	30.0	30.9**	34.1**

[1] Includes only light rail service operated by the Sacramento Regional Transit District. Service hours are light rail vehicle hours, which account for number of LRV's per train consist. Unless noted otherwise, tables in this document show train hours.

[2] Includes bus service by all operators except e-Tran.

Highlighted Changes:

*Start of service on the South Line Phase 1 line to Meadowview, and to City of Folsom.

**Early stages of service cuts and spike in gasoline prices

Source: SACOG, September 2011, based on data provided by operators, State Controllers Reports, and the National Transit Database.

Transit System Productivity and the MTP/SCS

Table 5C.9 provides a tabulation of service hours, passenger boardings, and boardings per service hour for the MTP/SCS compared with the 2008 MTP.

- Although the MTP/SCS includes a doubling of the amount of transit service, increasing from 4,446 hours[3] in 2008 to 8,706 by 2035, the amount of increase is significantly less than in the 2008 MTP, which nearly tripled service to over 12,000 hours by 2035.
- The MTP/SCS includes only a minor increase above 2008 levels by 2020 (4,799 service hours, compared to 4,446 in 2008). However, service cuts between 2008 and 2011 reduced service by up to 20 percent in the region, so the 2020 MTP/SCS service levels show a rebuilding of those cuts, plus a modest 9 percent increase over 2008 service.
- Transit passenger boardings increase sharply for the MTP/SCS. By 2035, total boardings are projected to be 640,700, a more-than-tripling compared to 2008. This is 18.8 percent higher in total than the 2008 MTP.
- Productivity of transit service is projected to more than double for the MTP/SCS, increasing from a regional average of 33.3 passenger boardings per service hour to over 70 by 2035. This is 72 percent higher than the 2008 MTP.

[3] Hours include light rail vehicle hours for LRT, not train hours shown in the earlier Table 5C.3. LRV hours account for the number of light rail vehicles in each consist (group of light rail cars), and are higher than train hours.

Table 5C.9
Transit Service and Productivity in SACOG Region, 2008 and the MTP/SCS

	Scenario			Changes/Differences		
Variable	2008	2020 MTP/SCS	2035 MTP/SCS	2035—from 2008 MTP	2008 to 2035 MTP/SCS	2035, 2008 MTP to MTP/SCS
Vehicle Service Hours (weekday)						
All Rail[1,2]	630	788	1,247	1,700	+97.9%	-26.7%
All Bus[3]	3,816	4,011	7,460	10,938	+95.5%	-31.8%
Region Total	4,446	4,799	8,706	12,638	+95.8%	-31.1%
Passenger Boardings (weekday)						
All Rail[2]	52,380	80,780	177,100	168,700	+238.1%	+5.0%
All Bus[3]	95,880	169,320	463,610	370,700	+383.5%	+25.1%
Region Total	148,260	250,100	640,710	539,400	+332.2%	+18.8%
Passenger Boardings Per Service Hour						
All Rail[2]	83.1	102.6	142.1	99.2	+70.9%	+43.2%
All Bus[3]	25.1	42.2	62.1	33.9	+147.3%	+83.4%
Region Total	33.3	52.1	73.6	42.7	+120.7%	+72.4%

[1] Reported as light rail vehicle hours, not train hours as in Table 5C.3. LRV hours are shown here to allow for comparison to the historic, observed data presented in Table 5C.8.

[2] In 2008 and 2020, All Rail includes LRT and Capitol Corridor within the SACOG Region. In 2035 MTP/SCS scenario, "All Rail" includes LRT and regional rail, plus tram/streetcar.

[3] In 2008 and 2020, All Bus includes express and local fixed route bus service. In 2035 MTP/SCS scenario, All Bus includes express and local fixed route bus service, plus shuttle and BRT.

Source: SACOG, September 2011.

Key Factors in Increasing Transit Productivity

Transit productivity is increased by the MTP/SCS through increasing transit service (doubling from 2008), and increasing transit boardings even more (more than quadrupling). A part of this increase is due to increased passenger ***trips*** (i.e., the entire journey from origin to destination), and partly due to an increase in the rate of transit *boardings per trip*. Currently, transit person trips generate about 1.35 boardings, indicating that about one-third of all trips include some sort of transfer. This boarding rate is expected to increase to 1.6 for the MTP/SCS—reflecting a future increase in the number of trips that include transfers—because as transit service becomes more frequent, and land uses more supportive of transit as an option for getting around, making transfers becomes more convenient and more prevalent. The increase in transit trips also raises the amount of farebox revenues available to fund transit operations, from about 24 percent of operating costs in 2009 to 38 percent of operating costs ($2.3 billion) by 2035.

Chapter 6

Policies and Supportive Strategies

Introduction/ Background

In 2005, the SACOG Board of Directors adopted six guiding principles for use with the 2008 MTP. The MTP/SCS serves as a revision to the 2008 MTP and retains those principles.

MTP/SCS Guiding Principles

Smart Land Use: Design a transportation system to support good growth patterns, including increased housing and transportation options, focusing more growth inward and improving the economic viability of rural areas.

Environmental Quality and Sustainability: Minimize direct and indirect transportation impacts on the environment for cleaner air and natural resource protection.

Financial Stewardship: Manage resources for a transportation system that delivers cost-effective results and is feasible to construct and maintain.

Economic Vitality: Efficiently connect people to jobs and get goods to market.

Access and Mobility: Improve opportunities for businesses and citizens to easily access goods, jobs, services and housing.

Equity and Choice: Provide real, viable travel choices for all people throughout our diverse region.

This chapter supports these principles through specific policies and strategies. The policies are higher-level actions and the strategies are more specific actions that implement the policies. The policies and strategies are separated into four interrelated categories: Land Use and Environmental Sustainability; Finance; System Maintenance and Operations; and System Expansion. The policies and strategies are numbered for reference purposes only and do not reflect priority.

The policy element of the MTP/SCS is required to address the transportation issues of the region, identify and quantify regional needs expressed within both short- and long-range planning horizons, and maintain internal consistency with other MTP/SCS elements (Government Code § 65080(b)). For the 2008 MTP, the SACOG board adopted 31 policies and many supportive strategies to implement the plan.

Since this MTP/SCS is a revision to the 2008 MTP, the policies and strategies of the prior plan are largely transferable to this MTP/SCS. For this plan, targeted modifications were made to update the policies and strategies, including the addition of policies and/or strategies to reflect new projects, research, and conditions since the last MTP, such as the national recession, Rural-Urban Connections Strategy (RUCS), and Lifeline Transit Study. Additionally, modified policies and strategies are included to ensure consistency of the MTP/SCS with SB 375 and to open a path for qualifying residential/mixed-use projects to use the CEQA streamlining benefits provided under SB 375.

The following sections show the policies and strategies related to each of the four policy categories.

Land Use and Environmental Sustainability Policies and Strategies

The MTP/SCS has been developed to follow SACOG board direction, state and federal requirements, and regional stakeholder input. The MTP/SCS policies and strategies continue to build on the Blueprint principles. In order to plan an efficient transportation system, the plan must include a transportation system that supports the land use patterns forecasted in the MTP/SCS. The Blueprint envisions compact development and mixed-use communities, a better balance of jobs and housing in communities, and a variety of housing types and prices in all communities to match an evolving market and provide a range of housing and transportation choices. This development future yields shorter commutes overall; more local trips within communities for which walking, bicycling, and transit become attractive options to driving; lower VMT; lower congestion; and more transit service and use.

The Rural-Urban Connections Strategy (RUCS) works synergistically with the Blueprint, providing economic development opportunities and preserving natural resource values in the more rural portions of the region. The Blueprint, RUCS and MTP/SCS together move this region significantly toward economic and environmental sustainability by reducing air pollution and greenhouse gas emissions; conserving energy, water, and open space; and enhancing both urban and rural economic vitality. The following policies and strategies guide SACOG in implementing the MTP/SCS.

1. Policy: Provide information, tools, incentives and encouragement to local governments that have chosen to grow consistent with Blueprint principles.

1.1. Strategy: Invest in the Community Design Funding program, an incentive program for local governments that provides transportation funding for smart growth developments that promote walking, bicycling and transit use.

1.2. Strategy: Pursue regulatory reform at the national, state and local levels to encourage Blueprint-style growth.

1.3. Strategy: Support incentive programs that make infill development more attractive or lucrative.

1.4. Strategy: Create and invest in a rural strategy and program to improve transportation systems that affect the economic viability of rural areas located in jurisdictions that implement good growth patterns, consistent with the Blueprint Principles, the Rural-Urban Connections Strategy, or other rural initiatives.

1.5 Strategy: Work with local jurisdiction staff to develop and maintain a development activity tracking tool, for use in local and regional planning, and to assess growth patterns both at the local and regional level.

2. Policy: SACOG intends to educate and provide information to policymakers, local staff, and the public about the mutually supportive relationship between smart growth development, transportation, and resource conservation.

2.1. Strategy: Provide computer software, training and technical assistance to local governments.

2.2. Strategy: Monitor and report on the transportation and air quality impacts of development patterns and their relationship to Blueprint growth principles.

2.3. Strategy: Monitor and report on commute patterns for all modes, traffic levels, and transit use and bicycle and pedestrian mode share compared with the projections in this MTP/SCS.

2.4. Strategy: Develop educational materials to inform local discussions, particularly in infill areas, about neighborhood travel behavior, health and the effects of higher density on traffic, transit, walking and bicycling.

2.5. Strategy: Continue to develop and apply health and social equity analysis methods and performance measures to help inform MTP/SCS updates and local discussions on development patterns, including transportation performance measures and opportunities related to accessibility, equity, public health and youth.

2.6. Strategy: Assist with mapping and coordination between SACOG, transit, and health and human service providers on transit planning and siting of lifeline services needing transit access. Develop educational materials and life-cycle methodology on public facility planning that incorporates the costs of extending transit service to locations outside existing transit corridors.

2.7 Strategy: During the design phase, review transportation projects to assess whether they foster transportation choices, improve local community circulation and provide access to opportunities or divide communities, and either avoid or mitigate negative impacts (including those to public health, safety, air quality, housing and the environment).

2.8. Strategy: Continue Airport Land Use Commission (ALUC) efforts that promote good land use planning around airports, minimize public safety hazards, and support the utility of each airport.

2.9 Strategy: Strengthen SACOG's modeling tools with the development of an economic land use model based on the PECAS framework. This model may support regional economic development efforts and inform a wide range of MTP/SCS efforts, including jobs-housing fit (i.e., the relationship between housing costs and wages around an employment center), infill incentives, congestion and parking pricing, and transportation project phasing.

2.10 Strategy: Provide technical analysis and education to inform policy and decision makers, local staff, and regional stakeholders about the benefits of strategic growth management on the region's open space resources and the economic and environmental benefits they provide.

3. Policy: SACOG will encourage local jurisdictions in developing community activity centers well-suited for high quality transit service and complete streets.

3.1. Strategy: Support development proposals that are well-suited and located to support high-quality transit use in Transit Priority Areas, through Blueprint analysis.

3.2. Strategy: Continue to identify best practices for complete streets, continue to add to the Complete Streets Toolkit, and initiate a technical assistance program to help local agencies develop street designs that are sensitive to their surroundings and context.

3.3. Strategy: Establish regional guidance for high-capacity transit station area planning.

3.4. Strategy: Support efforts by transit agencies and local governments to site and design transit centers and stations close to economic centers and neighborhoods and to expand park-and-ride facilities

at a few key stations.

3.5. Strategy: Encourage local agencies to develop an interconnected system of streets, bikeways, and walkways that support a more compact development form; avoid building new circulation barriers; accommodate safe travel for all users; and provide connections across creeks, freeways and high-speed/high volume arterials and through existing gated communities, walls and cul-de-sacs to access schools, activity centers and transit stops.

3.6. Strategy: Encourage development patterns that provide safe and efficient pedestrian and bicycle access to transit stops and trunk commuter transit lines.

3.7. Strategy: Conduct a research study and perform travel modeling and air emissions analysis to identify alternatives for local governments to use to modify current parking regulations to create incentives for people to use alternative modes. Study will be conducted with local governments and air districts; findings will be presented to all related and essential parties.

4. Policy: SACOG encourages every local jurisdiction's efforts to facilitate development of housing in all price ranges, to meet the housing needs of the local workforce and population, including low-income residents, and forestall pressure for long external trips to work and essential services.

4.1. Strategy: Develop the required Regional Housing Needs Plan to guide local agencies' assessments of housing supply and price ranges.

4.2. Strategy: Encourage adequate supply of housing at a variety of price ranges in the region, which will help to meet local demand, prevent the export of housing to adjacent regions, and, consistent with federal and state statutory goals, promote integrated and balanced living patterns that help provide access and opportunity for all residents and reduce the concentration of poverty.

4.3. Strategy: Continue to develop tools to assist local jurisdictions in assessing housing needs in a variety of price ranges, including jobs-housing fit tool and housing plus transportation cost analysis.

4.4. Strategy: Identify appropriate best practices for successful transit-oriented development in different settings through case studies from this MTP/SCS, and continue to assist local governments with environmental review to capitalize on SB 375 CEQA benefits for residential and residential mixed-use Transit Priority Projects.

4.5. Strategy: Provide support for jurisdictions to overcome common issues identified in local analyses of impediments to fair housing and a regional analysis funded by federal grant funding from HUD.

5. Policy: SACOG should continue to inform local governments and businesses about a regional strategy for siting industry and warehousing with good freight access.

5.1. Strategy: Work to identify and preserve land uses to meet goods movement needs of local, nearby customers.

5.2. Strategy: Study and consider the need for land for suppliers, distributors, and other businesses with a regional clientele that may prefer to be near the center of the region with good freeway access, but do not need high-cost center-city sites.

5.3. Strategy: Further study and consider the needs of the agricultural industry for aggregation and distribution, cold storage, warehousing, processing plants, and other facilities near transportation access.

5.4. Strategy: Share goods movement research and information completed through the RUCS to inform the work of the Next Economy—Capital Region Prosperity Plan, the region's current recession recovery plan under development.

6. Policy: SACOG encourages local governments to direct greenfield developments to areas immediately adjacent to the existing urban edge through data-supported information, incentives and pursuit of regulatory reform for cities and counties.

6.1. Strategy: Minimize the urban growth footprint of the region by improving interior circulation and access instead of access to and beyond the urban edge.

6.2. Strategy: Provide incentives and invest in alternative modes to serve infill and more compact development.

6.3. Strategy: Seek out funding to acquire conservation easements accompanying specific regional connector road projects, to protect land from development in areas that are not intended or zoned for development.

6.4. Strategy: Continue to pursue regulatory reform at the state and national levels to remove barriers to greenfield developments when appropriate at the edges of existing urbanization.

6.5. Strategy: Encourage local jurisdictions to use RUCS data and tools to analyze possible impacts to agriculture and natural resources from the urban growth footprint.

7. Policy: Implement the Rural-Urban Connection Strategy (RUCS) which ensures good rural-urban connections and promotes the economic viability of rural lands while also protecting open space resources to expand and support the implementation of the Blueprint growth strategy and the MTP/SCS.

7.1. Strategy: Use research, data and modeling to inform a stakeholder-driven process to conceptualize approaches to sustainable rural land use policies encompassing, at a minimum, issues such as agricultural practices, natural resource and agricultural land conservation, economic development and market influences (including markets for energy, carbon sequestration and other environmental services), rural development practices (including methods to encourage jobs-housing fit and minimize the impact of rural development on agriculture), and infrastructure needs.

7.2. Strategy: Ensure consistency between the RUCS and local Habitat Conservation Plans and Natural Communities Conservation Plans.

7.3. Strategy: Ensure that the RUCS is coordinated with the Blueprint and MTP/SCS to support each of these planning efforts individually, as well as collectively.

7.4. Strategy: Conduct analysis on how various rural land use strategies affect vehicle miles of travel, mode share and air emissions, as well as rural economic viability and environmental sustainability.

7.5. Strategy: Invest in transportation projects that help implement the RUCS recommendations. Investment recommendations may include agritourism-related and goods movement projects and funding rural road improvements between cities when the county implements growth patterns consistent with the Blueprint.

7.6. Strategy: Support improved farm-to-market access, including investments along key rural truck corridors and cost-effective short-line railways and connectivity improvements to the Port of West Sacramento.

7.7. Strategy: Continue to refine SACOG funding criteria to ensure that they adequately recognize the unique needs of rural areas and provide proper incentives to reward rural land use and transportation practices that benefit the region and local areas.

8. Policy: Support and invest in strategies to reduce vehicle emissions that can be shown as cost effective to help achieve and maintain clean air and better public health.

8.1. Strategy: Continue the region's previous commitment to Transportation Demand Management (TDM) programs as a strategy for education and promotion of alternative travel modes for all types of trips toward reducing Vehicle Miles Traveled (VMT) by 10 percent.

8.2. Strategy: Continue the region's previous commitment to funding the Sacramento Emergency Clean Air and Transportation (SECAT) program.

8.3. Strategy: Set aside funding for the annual Spare the Air campaign, a summer program operated by the Sacramento Metropolitan Air Quality Management District (SMAQMD) that informs the public about days when the ozone danger is high and encourages the public to use non-polluting options to driving.

8.4. Strategy: Help air districts and local agencies study localized air pollution impacts on health and the environment, including air toxins, by providing analysis and information from SACOG's planning work. Support public information efforts to raise awareness of these connections.

9. Policy: Use the best information available to implement strategies and projects that lead to reduced Greenhouse Gas (GHG) emissions.

9.1. Strategy: Adopt a transportation pricing policy, adopt a Safe Routes to School policy and implement a pilot program, expand public access to travel information through 511 program, and adopt a Complete Streets policy.

9.2. Strategy: Continue to implement MTP/SCS projects that are adopted as draft transportation control measures and identify strategies, as needed, to help reduce transportation-related emissions.

9.3. Strategy: Support the SMAQMD's Air Quality and Infill Streamlining (ISP) program.

9.4 Strategy: Create an alternative fuel vehicle and infrastructure toolkit for local governments, create a public education program on individual transportation behavior and climate change, and create a regional open space strategy that is informed by RUCS.

9.5. Strategy: Develop a regional climate change action plan, and develop and implement a construction energy conservation plan.

9.6. Strategy: Enhance I-PLACE^{3}S Model to assess GHG impacts.

10. Policy: Consider strategies to green the system, such as quieter pavements, cleaner vehicles, and lower energy equipment where cost effective, and consider regional funding contributions to help cover the incremental cost.

10.1. Strategy: Examine public policy seeking to reduce the cost of, or influence the tradeoffs, between operating efficiency and environmental impact.

10.2. Strategy: Encourage and make available a choice of efficient modes to move freight.

10.3. Strategy: Promote early investment in compliant diesel engines.

10.4. Strategy: Support equipment retrofits under the Carl Moyer program.

10.5. Strategy: Expand use of natural gas or hybrid delivery vehicles and handling equipment.

10.6. Strategy: Increase recycling of materials, such as tires and lubricants, and improve handling of waste water and chemical residues.

10.7. Strategy: Explore and publicize energy conservation at freight terminals.

10.8. Strategy: Encourage goods movement driver training programs that encourage fuel conservation, trip reductions and safety.

Finance Policies and Strategies

Prior to the national recession, transportation programs, like many other areas of public policy, faced shortfalls of funding compared to needs and growth. In this MTP/SCS, the plan not only sees slower rates of population, jobs and housing growth, there is also less money forecasted for investment. Transportation agencies must find ways to keep existing facilities in a state of good repair, continue operation of current services, and restore services from the recent vast cuts across the region. However, with funding for road maintenance and rehabilitation falling short of present need, and transit service capped by available operating funds in a region where fares averaged 24 percent of operating costs in 2009, new funding sources must be found to meet basic responsibilities to keep the system functioning. The region continually seeks funding sources that are stable, flexible and adjustable, and local option funding powers are preferable to new revenues under state or federal program control.

Federal and state funds that SACOG controls are mainly intended for capital expansion. SACOG typically uses its funds for regional-scale projects and related regional priorities; these projects have proven hard to fund locally, even under the present program structure whereby a significant share of funding comes from local development-based sources. With the continued shortfalls in county and city budgets, it is important for SACOG to support the local jurisdictions that are served by regional project investments. SACOG also intends to seek federal and state discretionary funding, targeted to projects well-tailored for the particular program, since any extra funds that can be obtained reduce overall program need and allow redeployment of local and regional funds. The following policies and strategies guide financial management and priorities for SACOG and local agencies.

11. Policy: Pursue and support enactment of sustainable funding sources adequate for maintenance and rehabilitation of highways, streets and roads and operations and maintenance of transit services for the region.

11.1. Strategy: Continue to pursue new and reformed transportation funding methods and sources to implement the MTP/SCS that are stable, predictable, flexible, adjustable and adequate in the whole to operate and expand the system.

11.2. Strategy: Strive to simplify and add flexibility to the overall funding structure when putting new financing tools or changes to the financing structure into place.

11.3. Strategy: Promote competition in the delivery of services, to foster greater efficiency, innovation, and diversity of options, including consideration of revised public agency arrangements, public-private partnerships or contracting out.

11.4 Strategy: Advocate for greater flexibility in the use of federal and state formula funds towards system maintenance purposes, especially in rural areas that are particularly limited in the available funding for these purposes.

12. Policy: SACOG should support authority for local option funding sources to allow local areas to customize transportation funding and investment for maintenance and operation of the existing system and expansion to meet future needs.

12.1. Strategy: Seek authority to set up funding sources for transit operations and road maintenance that can be controlled and adjusted at the local level, so that local agencies can consider using them when needed to support existing and expanded transit services and keep the existing road system in a state of good repair.

12.2. Strategy: Seek funding sources that are indexed to growth and inflation to pay for basic maintenance and operations.

12.3. Strategy: Support local agencies that seek to collaborate on inter-jurisdictional funding options.

13. Policy: SACOG invests federal and state funds that come to SACOG to achieve regional policies and priorities, as described in more detail in the sections that follow.

13.1. Strategy: Seek adequate funding so local agencies can maintain and rehabilitate streets and roads to a good state of repair into the future, encompassing more adequate state funding and local option funding authority to preserve regional funding for improvement and expansion of the urban and rural trunk highway and road system.

13.2. Strategy: Support new or increased funding resources for local agencies to enable operation of existing and expanded transit services, and maintenance and replacement of equipment and facilities, including local-option funding sources adequate to preserve regional funding for service expansion. Assist agencies with increasing trip reporting to the FTA's National Transit Database (NTD) to help increase federal transit funding for the region.

13.3. Strategy: Encourage cities and counties to collect development-based fees or funding sufficient for both local road improvements and regional-scale road, transit and/or bicycle pedestrian improvements so that regional-scale improvements can be built in a timely way, since SACOG's regional funding can meet only 25-30 percent of regional project costs in this MTP.

13.4. Strategy: Encourage local agencies to fund local arterial access and traffic capacity projects with local development-based fees supplemented with other local funds as appropriate.

13.5. Strategy: Study, coordinate discussions, and explore options for establishing a region-wide program dedicated to funding the growing need for roadway improvements and reconstruction and mitigation of community impacts on designated arterial truck routes and arterial roads that large trucks commonly use.

13.6. Strategy: Support the implementation of mitigation measures for environmental impacts identified at the project-level of analysis through conditioning regional transportation funds. For a project to receive funds managed through SACOG, the sponsoring agency must provide the mitigation monitoring plan and demonstrate adherence to mitigation measures in the certified project-level environmental document.

14. Policy: SACOG should look for specialized funding programs, and/or one-time funds at the state or federal level, and work with local agencies to bring in such funds to start innovative projects or advance specific projects that are well-matched to program goals.

14.1. Strategy: Keep apprised of federal and state program funding cycles and specific funding opportunities, advise local agencies about them in a timely way, and help to zero in on projects that fit program requirements and are far enough along in delivery to maximize chances for success at bringing federal or state discretionary funds into the region.

14.2. Strategy: Help coordinate multi-agency packages of projects for federal and state discretionary programs and grants, where a regional strategy seems likely to improve the chances of success.

14.3. Strategy: Fund some project development specifically to create a stock of key hard-to implement projects ready for ad hoc funding opportunities.

14.4. Strategy: Help local agencies get funding from specific safety programs for safety and security improvements.

14.5 Strategy: Increase rural transportation mobility by supporting greater coordination of rural transportation services and develop implementation strategies for successful and cost-effective programs, including volunteer driving programs and expanded rural vanpools.

14.6 Strategy: Cooperate with federal and state initiatives designed to better integrate planning and actions across multiple disciplines.

14.7 Strategy: Cooperate on new initiatives that more fully integrate transportation planning efforts with economic development issues and opportunities in urban and rural areas.

15. Policy: Manage state and federal funding that comes into the region so as to simplify and expedite project delivery, including working out ways to exchange various types of funds among local agencies and projects.

15.1. Strategy: Seek to pool funds and programs wherever reasonable and feasible, to increase flexibility in the use of funds and delivery of projects.

15.2. Strategy: Use available funding to the greatest reasonable extent to ensure timely construction of currently deliverable projects, and shift future funding commitments to projects that will be delivered in the future. Take into consideration availability of future operating funds when programming construction funds.

15.3. Strategy: Seek to focus federal funds on a limited number of projects that must by law be subject to federal requirements, so that many other projects can be funded through sources that allow them to avoid lengthy and/or costly federal requirements and processes.

15.4. Strategy: Support judicious use of bonding and other financial tools to enable earlier construction of projects, and consider use of regional funds to supplement or enhance revenue bonding tools when appropriate.

16. Policy: Study ways to use pricing more effectively in funding of transportation.

16.1. Strategy: Study ways that parking pricing can help achieve objectives of the MTP/SCS, including encouragement of walking, bicycling, transit use, vanpooling, carpooling, support for more intensive land uses, revenue for alternative modes, and surcharges for policy purposes.

16.2. Strategy: Seek at an appropriate opportunity a federal Value Pricing Pilot Program grant from the Federal Highway Administration to examine road and auto pricing options, such as high occupancy toll lanes or bridges, pay-at-the-pump auto insurance, or auto loans.

System Maintenance & Operations Policies and Strategies

Transportation agencies should keep existing facilities in a state of good repair and continue operation of current services, as a higher priority than system expansion. This responsibility falls primarily to local agencies, since federal and state funds that come to SACOG are mostly limited to capital purposes. Traffic operations improvements can produce more efficiency out of the existing road system. Planning for greater multimodal use as part of roadway maintenance and rehabilitation projects can be an economical way to provide more complete streets. The region could benefit from attention to more efficient truck movement and delivery, which has been growing faster than other traffic and spreading into suburban areas. Through the RUCS work, SACOG is looking at ways to support and plan for smoother truck traffic flow.

The transit system, comprised of a complex mix of services and agencies, can gain efficiency from better coordination of diverse services, better service features, and greater ridership. The current system focuses on lifeline service to those who are transit dependent and low-income and minority areas. Much of the potential for more effective transit service must come from services tailored to attracting riders who otherwise could drive in addition to preserving services for the transit-dependent. Transportation demand management ties this all together, by helping people find ways to travel besides by driving alone. The following policies and strategies express regional expectations about maintenance and operation of the existing transportation system.

17. Policy: Acknowledge and support preservation of the existing road and highway system as the top priority for local public works agencies and Caltrans, and expect to help them secure adequate funding sources for necessary work.

17.1. Strategy: Encourage and support Caltrans in seeking traffic management and safety improvements along with highway rehabilitation projects from the State Highway Operations and Protection Program. Ensure that both urban and rural needs are targeted.

17.2. Strategy: Consider public-private partnerships and competitive service contracts for maintenance and operations, for a more efficient system.

17.3. Strategy: Expect local agencies to examine and consider traffic operational strategies and investments as temporary improvements to buy time or develop lower-cost ultimate alternatives for capital projects for road expansion, with SACOG to consider such projects as a high priority for regional funding.

17.4 Strategy: Assist local agencies in seeking funding to develop effective pavement management systems that can assist in the evaluation, analysis, and prioritization of maintenance and rehabilitation needs on urban and rural local streets and roads.

17.5 Strategy: Support local agencies in developing multi-year maintenance and rehabilitation programs that enable early identification of cost-effective enhancements to improve pedestrian and bicycle access and safety.

18. Policy: Support the development and implementation of Corridor System Management Plans as a method of integrating transportation system operational management and regional planning so as to maximize system efficiency and effectiveness.

18.1. Strategy: Participate in the ongoing development and implementation of Corridor System Management Plans (CSMP) for the following corridors:

- Interstate 80: State Route 113 to Sierra College Boulevard
- Highway 50: Interstate 80 to Camino
- State Route 99: San Joaquin County Line to Highway 50, Interstate 5 to State Route 20
- Interstate 5: Hood-Franklin to Sacramento International Airport
- State Route 65: Interstate 80 to State Route 70

18.2. Strategy: Encourage all stakeholders to actively participate in the development and implementation of each CSMP.

18.3. Strategy: Coordinate SACOG transportation modeling and data collection activities with the travel forecasting and analysis activities associated with each CSMP.

18.4 Strategy: Continue to work with and seek grant funding from state and federal agencies working to align resources for long-range transportation and land use planning, such as the Federal Partnership for Sustainable Communities and the California Strategic Growth Council

19. Policy: Ensure coordination among all forms of existing and expanded transit services, including those provided by social services agencies, for a more effective system.

19.1. Strategy: Use timely updates of short range transit plans, the coordinated human services transportation plan, and periodic performance audits to provide guidance on priorities and estimates of funding needs and shortfalls.

19.2. Strategy: Support more seamless trips through better traveler information for trip planning (Intelligent Transportation Systems), reliable schedules, coordination between operators for transfers, service changes, complementary services, information available at transit stops, and implementation of the Connect Card, a universal fare card.

20. Policy: SACOG should work with transit operators to pursue improvements to transit access, security, comfort, schedules and information whenever opportunities arise.

20.1. Strategy: Seek to improve transit access, via safe and pleasant sidewalks and walkways around transit stops, designated bike routes and directional signage, accessibility for the disabled, on-board bike racks, better signs for transit access, shelters and improved transfer points, and secure bike storage facilities and park-and-ride locations.

20.2. Strategy: Build on Lifeline Transit Study findings to improve transit and supplemental transportation services for medical appointments by studying effective alternatives and increased connectivity to help meet cross-county health care transportation needs.

20.3. Strategy: Take steps to improve safety and security at crosswalks, transit stops, and along main access routes to transit, including rural areas, with higher priority for low income, minority, and high crime areas.

20.4. Strategy: Improve connections among all forms of transit service, by seeking better coordinated schedules among operators, more convenient and comfortable transfer locations, notice and coordination of schedule changes, next-bus signs at high use stops, and better trip planning tools and public communication.

20.5 Strategy: Implement Connect Card universal fare card and support outreach and marketing in jurisdictions implementing the Connect Card system.

20.6 Strategy: Support local jurisdictions and transit operators in implementing the findings of the Downtown Sacramento Transit Circulation Study.

21. Policy: SACOG should develop guidelines for rural transit services, as a lifeline for non-drivers and park-and-ride service for commuters.

21.1. Strategy: Preserve existing rural transit and paratransit service levels, but examine them periodically to ensure effectiveness for transit-dependent residents.

21.2. Strategy: Consider specialty transit services for agricultural areas seasonally and for tourist attractions and events.

22. Policy: SACOG in partnership with community and employer organizations intends to support proactive and innovative education and transportation demand management programs covering all parts of the urbanized area, to offer a variety of choices to driving alone.

22.1. Strategy: Increase public perception of the value, benefits, and use of transit, vanpool and rideshare services, via activities such as an enhanced 511 website, image and product-specific advertising, promotion of new and restructured services, the regional guaranteed ride home program, outreach for special events, and education for those unfamiliar with alternative modes, including transit services and bicycle facilities, with both access and safety education.

22.2. Strategy: Expand Transportation Management Associations (TMAs) and outreach partners to provide education and advocacy programs across the region's six county area, with broader focus on alternative travel choices for all trip types.

22.3. Strategy: Assist TMAs to broaden and update rideshare databases, offer incentives for taking alternative modes or teleworking, offer specialty services such as vanpooling, carsharing, or subscription bus service where feasible, expand promotional campaigns, and reach out to the public with personalized alternative trip planning and instant ridematching.

23. Policy: SACOG expects operators to plan for service to transit-dependent populations – disabled, low-income, senior, youth – within a context of service to attract riders who now drive.

23.1. Strategy: Improve transit services and options for disabled, low-income, and youth passengers by ensuring all vehicles and facilities are safe and accessible, access routes to transit stops are safe and accessible where feasible, drivers are trained about regulations and good practices, and transfers are convenient and usable.

23.2. Strategy: Prepare for a large increase in the senior population by using Universal Design features, such as low-floor vehicles, automatic doorways, flatter walkways and curb ramps, and handrails, to enable seniors to safely use regular transit services wherever possible and preserve limited paratransit resources for those who cannot travel without direct assistance.

23.3. Strategy: Continue to follow up on findings and outcomes from the 2011 Lifeline Transit Study with the Transit Coordinating Committee in order to inform transit agency decisions on critical service restoration priorities.

24. Policy: Ensure community outreach to low income and minority communities whose needs and concerns otherwise might be overlooked.

24.1. Strategy: Ensure transportation system improvements provide equitable and adequate access by road and transit to low-income and minority communities.

24.2. Strategy: Ensure that projects to serve those communities with greater transit needs are explicitly considered in the MTP/SCS and, when programming funds, pursue specific federal or state funding grants available for this purpose, and seek better coordination of all types of transit services and connections for these communities.

24.3. Strategy: Examine commute pattern travel needs of those in job placement programs such as CalWorks, those working non-traditional employment shifts, and those with reverse commutes as a guide to transit and supplemental travel service improvements.

24.4. Strategy: Seek to facilitate and deploy cost-effective supplemental transportation options, including shared ride arrangements, volunteer drivers, taxi vouchers, community travel companions, cost and fare-sharing, and mobility training on transit and bicycle/pedestrian options, to complement existing public transit and social service transportation.

24.5. Strategy: Ensure thorough examination, context sensitive design, and mitigation of transportation system impacts wherever feasible, particularly localized air quality and noise impacts, when building improvements in low-income and minority communities adjacent to freeways, major roadways, and railroad corridors.

24.6. Strategy: Continue to make available free-of-charge multilingual video and guidebook on transit, bicycling, walking, and carpooling in the region to individuals, community- and faith-based organizations, as well as on the SacRegion 511 website.

25. Policy: SACOG should study, consult with, and help coordinate local agency activities to provide for smoother movement of freight through and throughout the region.

25.1. Strategy: Improve SACOG's regional freight forecasting tools, including a periodically updated commodity flow survey that includes both consumer goods and agricultural products, upgraded economic model, shipping and trucking industry contacts to spot and verify trends, ability to estimate up or down from limited data points, and annual truck counts at key locations.

25.2. Strategy: Maintain a goods movement advisory group to share information about evolving freight patterns, technologies, and shipping needs, and identify, examine, and coordinate government policies, activities, and improvement projects that can make goods movement more efficient and reduce impacts in both urban and rural areas.

25.3. Strategy: Collect reliable information about urban and rural impacts of the logistics industry and the customers it serves, pertaining to infrastructure demands and safety, emissions, noise, and traffic impacts from trucks, and review the implications for nearby and downstream communities when local agencies consider permits for commercial and industrial businesses that involve significant amounts of truck traffic.

25.4. Strategy: Identify and reconsider regulatory and institutional barriers that hamper efficient truck travel patterns, identify an adequate number of preferred truck routes for efficient truck access into and across jurisdictions within the region, and actively seek solutions to accommodate truck access and traffic along corridors that do not create significant conflicts with adjacent land uses and minimize community concerns.

25.5. Strategy: Consider adding or changing features of projects to facilitate truck travel.

25.6. Strategy: Identify and consider projects that could expand the market for shipping freight by rail, merchant ship, or short line railways and that offer an alternative to trucking for more kinds of freight shipments, such as a deeper port channel, rail intermodal transfer points, and better intermodal connections for trucks to carry goods the "last mile" for delivery.

26. Policy: SACOG intends to preserve some capacity on major freeways within the region for freight and other interregional traffic by providing additional capacity for local and regional traffic on major arterials running parallel to the major freeways.

26.1. Strategy: Seek to coordinate regional truck routes for large trucks, and expect local agencies to include truck access policies and strategies in mixed-use and large commercial/industrial developments.

26.2. Strategy: Support rail and highway investments that route freight around, not through, the region.

26.3. Strategy: Open up interregional highway capacity only when goods movement and non-commute traffic warrants it. Evidence of this need can also occur when local roadways bear the burden of goods movement activity diverted from congested highways.

System Expansion Policies and Strategies

Although the region projects slower growth through 2035, it must expand the system to meet the current and future needs of residents. A key part of the system expansion includes planning for the areas that are most likely to grow. With neither funding nor political will to expand the system at the same rate as the projected population growth, road and transit expansion must be carefully targeted to achieve the region's growth and quality of life objectives. The MTP/SCS will double transit service, tailored to Center and Corridor and Established Communities, to bring in riders who now drive and more fare revenues to support operation of the larger system needed to do that.

Complete streets, designed for walking, bicycling and transit as well as autos, can offer good alternatives to driving locally, and reduce need for overall road expansion. However, roads must also be expanded strategically, to provide good access for infill development, support bus transit, and confine congestion to peak commute hours (a standard condition for robust urban economies nationwide). This region is unlikely to support significant freeway widening or new freeways, so it must conserve a portion of existing freeway capacity for trucking and interregional travel by providing alternatives for regional and local travel. Residents should have more access to high-frequency transit, bicycle and walking options to goods, services and amenities. The following policies and strategies lay out SACOG's investment priorities for regional funds - to support regional programs, regional-scale system expansion, compact urban land uses, and equitable expenditures over time —and guide decisions about system expansion.

27. Policy: Support road, transit, and bridge expansion investments that are supportive of MTP/SCS land use patterns.

27.1. Strategy: Focus on ensuring transit and the arterial system perform well for the increased number of local trips, to support infill and compact development from smarter land uses without pushing growth outward because of overly congested conditions, and on providing a strong grid network (which offers alternative routes) wherever land uses allow.

27.2. Strategy: Support corridor mobility investments along major arterials that serve multiple modes of travel through combining road capacity improvements with operational improvements to support smart growth. Supportive investments include enhancements for high-quality transit, technology deployment, bicycle and pedestrian improvements, and safer intersections.

27.3. Strategy: Support the development of new inter-city rail services, including increased Capitol Corridor services to Placer County and high speed rail along the Altamont corridor, all the while advocating for cost-effective implementation options and Blueprint-supportive compact and mixed-use developments adjacent to the rail stations.

27.4. Strategy: Support improved connectivity and increased safety and security through better maintenance of existing river crossings, and strategic new or expanded all-modal river crossings in Centers and Corridors Community Types.

28. Policy: Prioritize transit investments that result in an effective transit system that serves both transit-dependent and choice riders.

28.1. Strategy: Transit expansion should be targeted at land use patterns that will generate transit ridership and improve the cost recovery rates for transit service.

28.2. Strategy: Pursue transit expansion using a wide spectrum of services, each best suited to particular travel markets, considering but not limited to light rail, streetcar, express bus, Bus Rapid Transit, local bus, neighborhood shuttle, demand-response service, subscription bus, and jitney.

28.3. Strategy: Consider the full life-cycle cost of transit options including both capital and operations, the relative value of broader area coverage versus high capacity for a limited corridor, and more routes versus higher frequency, for each situation.

28.4. Strategy: Develop trunk transit corridors between communities and local transit circulation within communities, to attract riders both for commuting and local activities.

28.5. Strategy: Develop local transit services that serve local travel patterns and meet high-capacity trunk transit lines with timed transfers.

28.6. Strategy: Design commute transit as a door-to-door system, with full or limited-stop express routes, short waits at transfer points, and walk and bicycle access at each end.

28.7. Strategy: Develop a bus and carpool lane system for key commuter corridors and expand transit service to use it.

28.8. Strategy: Address commute congestion to switch drivers into empty seats in both transit and autos with transit-first/carpool-second strategies for downtown Sacramento, and carpool-first/transit-second strategies for suburban job centers until employment density indicates a shift.

28.9. Strategy: Seek to develop good bus transit service with heavy established ridership as a precursor to investment in rail transit, to ensure return on the high capital investment for rail.

28.10. Strategy: Factor in the benefit of rail transit as a permanent investment, with stronger ability to attract transit-oriented development patterns around it, where local smart growth planning and the real estate market already promise development dense enough to support rail investment.

28.11. Strategy: When a transit route or service fills to capacity, examine complementary service of another type as an alternative simply to adding capacity to the route that is full.

28.12. Strategy: When planning high-quality transit along light rail, regional rail and high speed rail corridors, also plan for supportive features that include sidewalks and walkways, passenger shelters, or transfer stations, next-bus notification signs, signal preemption and park-and-ride lots.

29. Policy: SACOG encourages locally determined developments consistent with Blueprint principles and local circulation plans to be designed with walking, bicycling and transit use as primary transportation considerations.

29.1. Strategy: Invest in safe bicycle and pedestrian routes that improve connectivity and access to common destinations, such as connections between residential areas and schools, work sites, neighborhood shopping, and transit stops and stations. Also invest in safe routes to and around schools so trips can be made by bicycling or walking.

29.2. Strategy: Invest toward the creation of a regional bicycle and pedestrian network, connecting first those communities that already have good local circulation networks in place, but also supporting efforts throughout the region to improve connectivity and realize public health benefits from these investments.

29.3. Strategy: Utilize the Planners Committee, Regional Planning Partnership and Transit Coordinating Committee to better coordinate information-sharing between jurisdictions on transit, bicycle and pedestrian improvements to ensure connected routes, sharing of effective ideas, and more complete public information.

29.4. Strategy: Continue to support improved bicycle and pedestrian connectivity through SACOG's Regional Bicycle and Pedestrian and Community Design Grant funding programs and maintaining program criteria that regional road rehabilitation projects include complete streets or complete corridor features.

29.5 Strategy: Help facilitate improved coordination between transit agencies, public works departments and local land use authorities in planning new developments that are transit-, bicycle-, and pedestrian-supportive and timed so that new facilities and transit services are more likely to be available at the time the new growth occurs.

30. Policy: SACOG also gives primary priority to selective road expansion, to support infill development and forestall midday congestion.

30.1. Strategy: Pursue strategic road expansion that reduces congestion and supports effective transit services, walking and bicycling.

30.2. Strategy: Expect that feasibility and corridor studies, project study reports, and environmental studies will consider high-quality transit, bicycle and pedestrian investments when examining how to provide additional capacity on main highway or bridge corridors.

30.3. Strategy: Pursue strategic road expansion that reduces congestion on access routes to areas with significant infill development.

30.4. Strategy: Give priority for roadway and intersection expansion to routes where midday demand approaches existing capacity or excessive peak period demand threatens to spill over into midday, so no part of the system fails to function continuously for much of the day.

30.5. Strategy: Support expansion of trunk arterials that provide access to job centers and freeway interchanges to provide enough capacity to forestall traffic diversion through neighborhood streets.

30.6. Strategy: Provide technical guidance to local agencies and invest regional funds to build complete streets projects through designated and planned community activity centers, to ensure bicycles, pedestrians, and transit can share the road safely and compatibly with autos.

31. Policy: As long as the existing funding and program structure remains essentially as it is today, SACOG intends to invest funds that are at SACOG's discretion, following these policy guidelines:

31.1. Strategy: Continue to use funds coming through SACOG to fund regional objectives for air quality, community design, transportation demand management, and bicycle and pedestrian programs. The funding level should be proportionally at least as great as programming levels since the regional programs began in 2003.

31.2. Strategy: Continue to help fund regional-scale and local investments across urban, suburban, small community and rural areas with the priorities and performance outcomes to be endorsed by the SACOG Board prior to the biennial funding cycle.

Chapter 7

Environmental Sustainability

Minimize negative transportation impacts on the environment for cleaner air and natural resource protection

Introduction to Environmental Sustainability

Environmental sustainability is one of six MTP principles addressed in this MTP/SCS. The desire to minimize negative transportation impacts on the environment for cleaner air and natural resource protection has always been an important consideration in each MTP. However, since the adoption of the 2008 MTP, two important changes have happened that affect the environmental sustainability analysis in this MTP/SCS.

First, California adopted SB 375 (Chapter 728, Statutes of 2008). The law focuses on aligning transportation, housing, and other land uses to achieve greenhouse gas (GHG) emission reduction targets established under the California Global Warming Solutions Act (AB 32). SB 375 requires California MPOs to develop a Sustainable Communities Strategy (SCS) as part of the MTP, with the purposes of identifying policies and strategies to reduce per capita passenger vehicle-generated GHG emissions. The SCS must identify the general location of land uses, residential densities, and building intensities within the region; identify areas within the region sufficient to house all the population of the region; identify areas within the region sufficient to house an eight-year projection of the regional housing need; identify a transportation network to serve the regional transportation needs; gather and consider the best practically available scientific information regarding resource areas and farmland in the region; consider the state housing goals; set forth a forecasted development pattern for the region; and allow the regional transportation plan to comply with the federal Clean Air Act. For further discussion of SB 375, see Chapter 1.

Second, SACOG launched the Rural-Urban Connections Strategy (RUCS) at the conclusion of the 2008 MTP in an effort to provide policy and technical approaches to addressing or avoiding impacts to rural resources in the Sacramento region. The project was identified as a mitigation measure for impacts to agricultural lands from the 2008 MTP, as well as a Transportation Control Measure as part of the region's plan to meet federal air quality requirements. RUCS is also part of SACOG's effort to streamline the NEPA environmental review process for transportation projects. The region's approach to urban growth, as laid out in the MTP/SCS, minimizes the amount of open land that will be needed to accommodate growth through the planning horizon. This result is important for balancing the needs for future growth while also conserving open space resources that provide economic and environmental benefit for rural areas and for the entire region. Through the RUCS project, SACOG has developed a more holistic approach to this balanced solution by looking in detail at the rural challenges and opportunities to protecting and promoting economic and environmental sustainability. In the same way that Blueprint is seen as an economic development and environmental sustainability strategy for urban areas, the RUCS project is an economic and environmental sustainability strategy for rural areas. The RUCS project is an integral piece of the MTP/SCS and a strategy for the region's success.

This chapter is divided into three sections. The first provides information and issues that relate to the RUCS project, including why and how agriculture and farmland, habitat and other natural resources, and water are integral to the plan. The second, air quality and health, looks at the different ways the impacts on the regional community are considered in the development of the MTP/SCS. The third and final section, climate change, addresses how the climate is affected by land use and transportation choices and what the MTP/SCS does to minimize these impacts. Each of these sections will discuss the research and analysis that was carried out in order to inform the development of the MTP/SCS, as well as the effect of the plan on these issues. SACOG considered these issues as key factors in creating not only a successful MTP/SCS, but a vibrant region.

Rural-Urban Connections Strategy, Natural Resources and Farmland

The MTP/SCS land use forecast and transportation system attempt to minimize negative impacts on various natural and manmade resources, building on local policies and strategies related to conservation and protection of these resources. There is acknowledgement around the region of the need to maintain a balance between the need to urbanize and the need to conserve rural lands and their uses. The two competing pressures exist in the interest of economic sustainability. RUCS, an implementing activity of the MTP/SCS, provides additional information and a powerful set of analytical tools to the region's local governments and stakeholders engaged in this important discussion. This section will reference much of the RUCS project work to discuss environmental sustainability relating to agriculture and farmland, infrastructure, recreation and open space, habitat and natural resources, water resources, and flood control. For more information on the RUCS project, including work completed to date, see Appendix E-2—Rural-Urban Connections Strategy.

An Overview of the Rural-Urban Connection

Although most of the Sacramento region's 2.3 million residents live and work in urban areas, the region spans an extraordinary range of landscapes. From the Sierra forests to fields that feed the world, our region enjoys remarkably diverse lands and natural resources. Across the six counties of El Dorado, Placer, Sacramento, Sutter, Yolo and Yuba, approximately 85 percent of the lands are agricultural, forest, or other open space. The contributions of farms and open spaces are vital to the success of the entire region. This section explores these various landscapes in terms of what they mean to the region, how they fit within the framework of the MTP/SCS, and what impact the plan has on these resources.

Although RUCS began at SACOG, farmers, ranchers, agricultural researchers, farm bureaus, local, state, and federal officials, distributors, chefs and many other stakeholders have made the project possible. RUCS outreach and research is organized by five broad topic areas, including: land use and conservation, infrastructure, economic opportunities, forest management, and regulations. SACOG gathered data and conducted research for each topic area collaboratively and with input from local agriculture, planning, economic development, and environmental representatives to help the region better understand the unique issues in rural areas. SACOG conducted stakeholder workshops to vet research and findings on each of the topics and to develop innovations that help address challenges and promote opportunities for rural economic viability and environmental sustainability. At the same time, the SACOG board participated in a series of agriculture field trips to learn about the opportunities and challenges facing the agricultural economy in different parts of the region.

The RUCS effort has drawn from land use, agriculture and open space elements of county general plans, and from existing open space and habitat planning initiatives, to address land use issues that are critical to conserving and enhancing rural resource lands. SACOG reviewed these plans to understand the existing policies that conserve land and promote agricultural viability and habitat quality. This work helped SACOG forecast development in the MTP/SCS. Coupled with technical work, SACOG and its partners have a richer understanding of current challenges and opportunities for enhancing rural economic viability and environmental sustainability.

Agriculture/Farmland

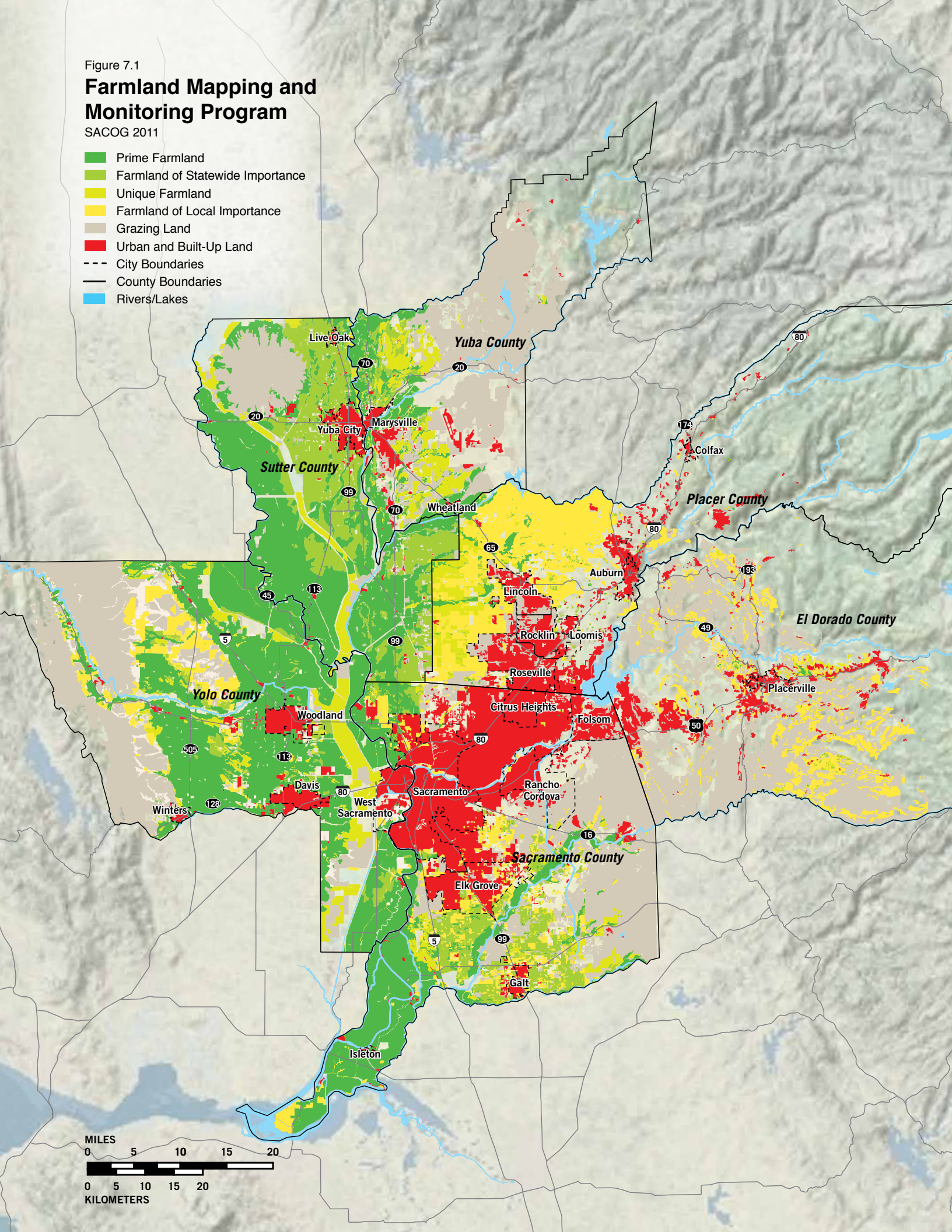
Agriculture has deep roots in our region's history and future. The Sacramento region has some of the most productive farmland in the world. While agriculture is a $1.66 billion industry in the Sacramento region, there is more that we get from agriculture than revenue. These areas provide benefits such as habitat, flood control, groundwater recharge, carbon sequestration, and energy production. Loss of these lands for agricultural purposes not only has an economic impact, but also environmental and social impacts.

In developing the MTP/SCS land use forecast and transportation system, SACOG relied on its RUCS research and the policies of local governments to develop urbanization assumptions based on the most recent information available. Local land use policies related to agricultural protection and preservation were of particular importance in this effort.

Figure 7.1

Farmland Mapping and Monitoring Program

SACOG 2011



The California Department of Conservation maps farmland throughout California under the Farmland Mapping and Monitoring Program (FMMP). Figure 7.1 shows a 2008 FMMP map of these farmlands in the MTP/SCS plan area. An acreage summary of the FMMP mapping categories is presented in Table 7.1. Most of the land located west of the Sierra Nevada foothills and east of the Capay Hills is classified, under the FMMP, as Important Farmland (i.e., Prime Farmland, Farmland of Statewide Importance, Unique Farmland, or Farmland of Local Importance).

Table 7.1
Acreage Summary of Farmland Mapping and Monitoring Program Mapping Categories in the SACOG Region

	El Dorado	Placer	Sacramento	Sutter	Yolo	Yuba	Region
Prime Farmland	770	7,921	104,282	165,319	255,074	41,325	574,690
Farmland of Statewide Importance	922	4,868	49,436	106,565	16,789	10,973	189,552
Unique Farmland	3,765	20,188	15,432	19,079	45,727	32,586	136,778
Farmland of Local Importance	59,669	100,832	43,819	3	60,323	4	264,651
Grazing Land	194,324	24,398	156,559	52,532	157,880	141,597	727,290
All Farmland	259,450	158,207	369,529	343,498	535,793	226,485	1,892,961
Urban and Built-Up Land	32,165	58,623	177,915	13,226	30,194	13,667	325,789
Other Land	237,414	188,997	70,763	30,608	79,127	164,821	771,730
Water	6,881	4,559	17,558	2,037	7,581	6,653	45,268
Non-Farmland	276,460	252,178	266,236	45,870	116,902	185,141	1,142,788
Total Area Surveyed[1]	535,910	410,386	635,765	389,368	652,695	411,626	3,035,749

[1] Approximately one million acres of land within the Proposed MTP/SCS plan area in eastern Placer and El Dorado counties were not surveyed. The survey area excludes most of the Sierra Nevada, as well as desert and forested parts of California that are less likely to have productive farmland. Some of these locations may be added in the future, while most areas identified as Local, State, and Federal Owned Land will not be added. Some small areas of public land are included in the survey area, generally as 'Other Land'. See California Farmland Conversion Report 2006–2008, pg. 5 (California Department of Conservation, 2011).

Source: California Department of Conservation, 2011. California Farmland Conversion Report 2006–2008.

As the table shows, Important Farmland is particularly prevalent in the counties of Sacramento, Sutter and Yolo, due to the fertile soils and flat topography of these valley counties. Western Yolo County, the eastern third of Sacramento County, the Sutter Buttes region in Sutter County, and the foothill regions of El Dorado, Placer and Yuba counties are predominantly classified as grazing land. Although El Dorado, Placer and Yuba counties contain less Important Farmland, these counties contain significant Grazing Land and Other Land. According to FMMP data, only 10 percent of the region is currently urbanized. The abundance of agriculture and farmland in the plan area is important to the region for economic, social and environmental reasons, but also to the rest of world. These lands are some of the most productive farmlands in the nation and provide food for the world.

From 1988 to 2005, a period of 17 years, the region grew by approximately 657,000 people. In that same time, approximately 200,000 acres of farmland were converted to urban and rural development (over 5 percent of the total farmland, much of which was higher-quality farmland). This is the impact the update of the MTP strives to minimize. For a longer planning period of 27 years (2008–2035), and an additional 871,000 people, this MTP/SCS forecasts the conversion of 36,396 acres of farmland by 2035. And, as Table 7.2 shows, less than half of that impact comes from Protected Farmland. This significantly lower rate of conversion is due largely to local and regional efforts to balance urban expansion with the protection of economically viable farmland.

Table 7.2
MTP/SCS Land Use and Transportation Impacts to Farmland Mapping and Monitoring Program Protected Farmland

	Acres of Impact			
	Prime Farmland	Unique Farmland	Farmland of Statewide Importance	Total Protected Farmland
Land Use Growth Footprint	3,315	903	3,940	8,158
Transportation Projects [1]	733	139	631	1,503

[1] Transportation projects considered for this analysis include new roadways, new light rail routes and roadway widenings. Other transportation projects occur within existing rights-of-ways. Acres of impact were calculated by measuring a 100-foot buffer from road/rail centerline. Impacts in this table are therefore, high estimates of impact.

Source: California Department of Conservation, 2011; SACOG, 2011.

This decrease in the impact to farmland from the MTP/SCS is important as the viability of the agriculture industry is correlated with the amount of land in production and the type of production. Limited farmland conversion can help to maintain the approximately $3.3 billion economic output related to agriculture in the Sacramento region, and protect employment of over 21,000 people in the agricultural industry, ranging from laborers that help farmers plant and harvest their crops to financial, legal and other professional services that support the industry. This information from the RUCS project and how it is integrated into the plan does two things for the region. First, it shows that these resources provide a substantial and stable source of economic activity. Second, it provides invaluable information about rural lands to inform the long range planning efforts taking place throughout the region at the local level.

The Williamson Act is another mechanism that affects the viability of farmland. Enacted in 1965, the Williamson Act allows farmland owners to enter into contract with a county to keep land in agricultural use over a ten-year period in return for a lower property tax rate based on agricultural production value rather than potential urban development value. This prevents or postpones conversion of farmlands to urban uses when landowners want to keep farming. Table 7.3 shows the amount of agricultural lands under Williamson Act contract in each of the Sacramento region's six counties.

Table 7.3
Williamson Act Lands within the SACOG Region as of 2009

	Prime	Nonprime	Total	Percent
El Dorado	2,315	31,800	34,115	5%
Placer	15,470	26,169	41,639	6%
Sacramento	87,617	93,554	181,171	24%
Sutter	51,408	13,165	64,573	9%
Yolo	244,050	174,477	418,527	57%
Yuba[1]	0	0	0	0%
SACOG Region	**400,860**	**339,165**	**740,025**	**100%**

[1] Yuba County does not participate in the Williamson Act program.

Source: California Department of Conservation, 2010. The California Land Conservation (Williamson) Act Status Report 2010.

As of 2009, the Sacramento region contained a total of 740,025 acres of land contracted under the Williamson Act. Of those acres, over 400,000 acres were prime farmland and about 339,000 acres were nonprime. More than 50 percent of both prime and nonprime lands under contract are located in Yolo County. Just under one quarter of all contract acres are located in Sacramento County. Though state subventions to backfill lost property tax revenue have been eliminated, the program is still embraced by participating counties in the region and remains an important part of their farmland conservation strategies. That said, a landowner may cancel or non-renew a Williamson Act contract at any point. As of 2009, 36,024 acres were in non-renewal. Nevertheless, of the 740,025 acres under Williamson Act contract in 2009, only 965 acres, (0.1 percent of contract acres) are impacted by the MTP/SCS.

One of the key land use issues studied in the RUCS project is addressing the conflict between urban and rural uses at the interface of these two land uses. Analysis of historical cropping patterns shows that rates of fallowing triple at hard edges (i.e., where there is a clear line between urban and rural) and quadruple at soft edges (i.e., where there is a gradual transition from urban to rural) at the urban edge due to conflicts and speculation about urbanization. These empirical data highlight how important it is to manage both sides of this edge as urban and rural uses transition to the other. Conflicts from rural uses for people in adjacent urban areas can include spraying, noise, odor and dust. Conflict from urban areas for people in adjacent rural areas can include traffic, theft, vandalism, and loose pets. These conflicts complicate production practices and often limit what a farmer can grow. Policy responses such as agriculture and open space designations, growth boundaries, buffers, right-to-farm ordinances, rural housing restrictions, and land conservation can be effective, particularly when bundled to address specific issues in a particular area. The RUCS project has helped the region understand that there are no one-size-fits-all solutions, as demonstrated by the unique land management and conservation approach in each county (Appendix E-2—Rural-Urban Connections Strategy).

While there are dozens of general plan designations for urban uses, the diverse types of agriculture—from rice fields to peach orchards to diversified farms—are all labeled agriculture. This simplified view makes it hard for policy makers and economic development agencies to help growers, processors or distributors. In an effort to have a more detailed understanding of our agriculture and forest lands, crop data were collected at the field level across more than 2 million acres of farmland as part of the RUCS project. The culmination of this work characterizes crops not as one single use, but as 33 distinct landscape types. Each landscape type is backed by input cost, yield, price, and other factors such as habitat. The data are used in models developed for the RUCS project that can show how changing crop patterns, market conditions and policy and business decisions may affect the viability of agriculture. The specific outputs include: yield and value of production, demand for inputs (e.g., labor, water, fuel, seed, trucking), and net returns.

This analysis capability gives the region a robust set of data, including what crops are on the ground today and which of those are most impacted by the MTP/SCS development. These data have been used to inform issues related to water, safety on rural roads, and the interface of rural and urban traffic with additional development. This can all help decision makers craft better policies and plans, help agricultural businesses make operational decisions, and help the public understand the trade-offs that affect rural economies.

Complementary to conserving open land is supporting the economic activities on that land. In some cases, open lands become urbanized when property owners cannot

earn a living on their land. Once lost to development or other uses, that land cannot provide food or environmental services (e.g., habitat, flood control, groundwater recharge, carbon sequestration and energy production). There are increasing opportunities in agriculture: increasing demand for food internationally, increasing regional demand for locally produced food, state mandates for alternative energy production, and the potential for GHG emissions offsets. These opportunities offer the potential for regional economic growth, and to support an industry that manages our rural lands to provide not only food and energy, but also all the other environmental services noted above that contribute to the region's sustainability.

The cornerstone of the RUCS project is to understand what factors affect profitability and to find ways to enhance the economic viability of rural lands. SACOG uses this information to create scenarios to evaluate how production practices, market fluctuations and global events will affect growers' economic viability. SACOG adapted its land use planning tools developed in the Blueprint process—initially designed to analyze urban development scenarios—to analyze agriculture scenarios. This, along with an econometric model and other tools, help analyze various possible future scenarios for agriculture. For instance, the models can simulate how worldwide events such as droughts and resulting higher grain prices can have direct impacts on farmers in the Sacramento region. Another example is testing how rising oil prices will impact fuel and fertilizer costs, thereby affecting viability and decisions to plant or leave a field fallow. Other factors can be tested including changes in labor costs or water supplies and cost. The models can also test market conditions, by exploring how changes to business practices or commodity prices will affect agricultural viability and fallowing. Farmers in our region are major players in the national and world economies. Their economic livelihood depends on being able to quickly and successfully adapt to events and trends they cannot control. The RUCS analytical tools will help them do that, and help the public agencies in the region understand what they can do to help. Appendix E-2 provides a more detailed discussion of the tools used in the RUCS project.

SACOG's tools are designed to work at all scales of analysis. At a macro scale, these tools can help the region understand what factors affect agricultural viability and possible policies or economic development strategies that could support the industry. For example, results that show where and how much labor is needed for crops in the region can help decision makers identify where housing and transportation services for agricultural workers would be best located. Trucking demand results will help the region identify key farm-to-market routes and where road improvements could help support the industry. At a micro scale, using SACOG's tools, a farmer could estimate return on investment by adjusting production variables and identifying those that most impact farming operations.

The Infrastructure of Agriculture

In many rural parts of the region, agriculture and other open space uses share roadways with rural housing development. SACOG's transportation modeling shows that on average, rural residential residents (living on one to ten acres) travel an average of 80 miles per household per day, compared to an average of 30 vehicle miles traveled per household in urban areas. This creates traffic and safety issues in our rural areas. Rural economic development and agritourism objectives can sometimes exacerbate this conflict by bringing more trips onto rural roads. Rural commuting is discussed in more detail in Chapter 9—Economic Vitality.

The issues caused by the average daily miles driven in rural areas are compounded by the incoming farmworker traffic to these areas. A lack of farmworker housing not only challenges labor supply, but also may contribute to traffic impacts as workers drive or are transported sometimes long distances. And in some areas, available farmworker housing is generally far from retail, medical and other services, creating another source of traffic on rural roadways. The MTP/SCS land use pattern forecasts no new development within agricultural areas and only a small amount in rural areas—approximately 5,000 housing units between 2008 and 2035. This level of growth helps to address the concern of longer daily driving by offering some additional housing potential near agriculture related jobs, yet does not add much additional burden to rural roads. Chapter 3 provides more discussion on the land uses associated with the MTP/SCS.

In addition to addressing these issues through changes in land use, transportation investments made in the MTP/SCS help to improve travel in rural areas as well. The MTP/SCS invests $6.8 billion on local roadway improvements. One targeted area is for operational improvements in rural and small communities. This includes safety improvements along farm-to-market routes and corridors along the rural-urban edge. Chapter 4 details the various transportation investments made in the MTP/SCS.

Beyond road investments, SACOG is beginning to look at other infrastructure needed to support agriculture. Aggregation, distribution, processing, and storage facilities are an important part of the agriculture infrastructure. However, the region has experienced a number of facility closures. Many economic factors—some of them international—contribute to these closures. Trucking products to facilities outside of the region increases vehicle miles of travel, emissions, transport costs, and potentially reduces product quality and therefore price. In some cases, the loss of a facility causes farmers to cease growing a particular crop altogether. Such closures also eliminate direct and indirect processing jobs, as well as the economic multiplier associated with those jobs and the facility. As local markets take hold in the region, advocates have identified local food system infrastructure as a necessity to scale up the system for

larger customers of local food, particularly institutions which often need pre-cut and processed food for their services. It takes a complex distribution system to move food from fields to consumers. Food distribution centers can provide a valuable connection between local producers and local wholesale, retail, food service, institutional and other food outlets—while relieving producers of the responsibility of aggregating, marketing, and distributing product. Distribution centers could also decrease vehicle miles traveled by growers who currently deliver to multiple sites, leaving more time for farming. State grant funding is enabling SACOG to analyze how to establish food system infrastructure in the region to support both production and local agriculture for markets outside and within the region.

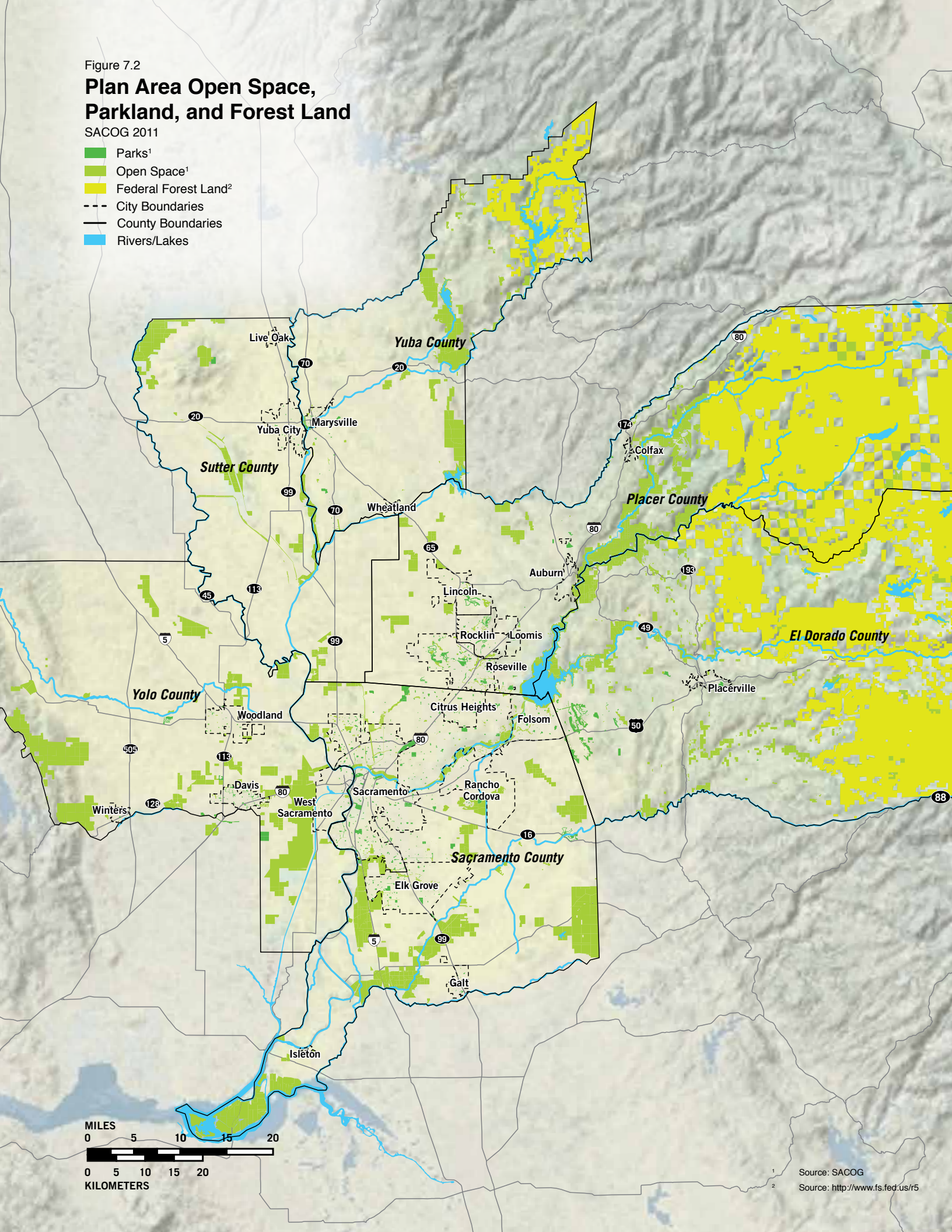
Recreation and Open Space

Beyond agriculture, open space includes forestry, parks, trails and wildlife areas that not only provide habitat, but also support recreational activities, educational opportunities and the connection between built and natural environments. Public parks, trails and wildlife preserves are the dominant means by which people connect with nature. This green infrastructure is part of the natural heritage and presents opportunities to understand how it relates to the built environment. Private assets, such as the Nature Conservancy's Cosumnes River Preserve, add to the inventory of public recreational and wildlife areas that are part of the region's rural fabric. As conservation plans throughout the region are completed, this inventory will include lands that are set aside as part of those efforts. SACOG's inventory of these lands is continually updated and currently accounts for roughly 252,000 acres of parks and conservation lands, including 42,000 acres in urban areas (Table 7.4). The data are derived from the California Protected Areas Database and discussions with our member agencies, and are taken into consideration when identifying areas where future growth may occur. For example, when the SCS was developed as part of the MTP, a geographic boundary of various open space lands was used to limit the growth that could occur in an area.

Figure 7.2

Plan Area Open Space, Parkland, and Forest Land

SACOG 2011



[1] Source: SACOG

[2] Source: http://www.fs.fed.us/r5

Table 7.4
Acres In Open Space Land by County

County	Acres	Urban Open Space[2]	Outside Urban Areas
El Dorado[1]	34,639	137	
Placer[1]	78,787	10,696	
Sacramento	44,085	27,625	
Sutter	12,571	174	
Yolo	77,027	3,375	
Yuba	4,930	372	
Total	**252,039**	**42,378**	**209,661**

[1] Does not include Tahoe Basin.

[2] Open space includes parks, open space, habitat, easements, any open land that is not agricultural and not forest.

Source: SACOG, September 2011.

Habitat and Natural Resources

According to federal and state requirements, every land development and transportation project must mitigate, or compensate for, the effects on sensitive habitat and open space. In response to the mandate to conserve natural resources in a more systematic manner, several jurisdictions in the region have been developing Habitat Conservation Plans (HCPs) and Natural Communities Conservation Plans (NCCPs). This section provides a summary of the status of habitat conservation plans (HCPs) and natural community conservation plans (NCCPs) in the region, although not all of these plans have been adopted or fully implemented. These plans include: the South Sacramento HCP, Natomas Basin HCP, Yuba/Sutter NCCP/HCP, Yolo County NCCP/HCP, Placer County Conservation Plan, and the El Dorado County Integrated Natural Resource Management Plan. The boundaries of each of these plans are depicted in Figure 7.3.

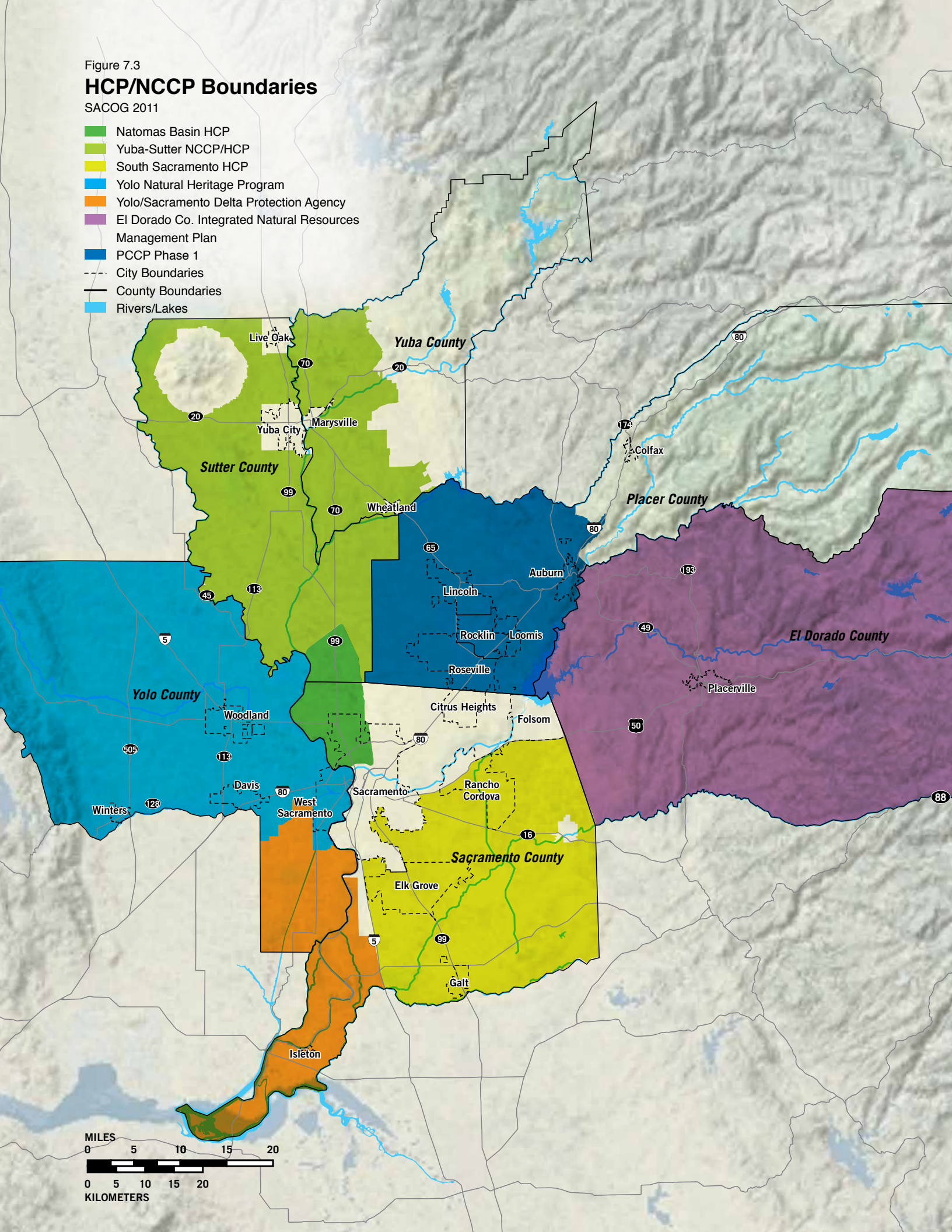
During implementation of specific projects, an activity subject to Section 10 of the Endangered Species Act (ESA) and considered a covered project under the implementing rules of an adopted HCP or NCCP may be able to participate in the plan. To the extent possible, SACOG works with federal agencies, regional partners, and local jurisdictions regarding proposed development in areas containing federally or state protected natural resources. SACOG gathers and considers information on the timing of any applicable permits and their relationship to HCP and NCCP planning efforts to feed into phasing assumptions for the MTP/SCS land use forecast. Given available data, mapping and HCP and/or NCCP status, SACOG considers impacts on or conservation of areas that have biological resources and/or provide habitat for species covered by the federal and state ESA and the Native Plant Protection Act.

The ultimate resolution of the many on-going natural resources planning efforts will have a major influence on future growth patterns in the region. The land use forecast in this MTP/SCS considered the uncertainties associated with these on-going efforts throughout the region. The progress of these planning initiatives will be carefully monitored and it is expected that once the HCPs/NCCPs are adopted and being implemented that their provisions will have a significant influence on the land use forecasts in future MTPs/SCSs.

Figure 7.3

HCP/NCCP Boundaries

SACOG 2011



South Sacramento Habitat Conservation Plan

The South Sacramento Habitat Conservation Plan (SSHCP) is currently in preparation. The SSHCP area encompasses 345,000 acres in southern Sacramento County. The SSHCP will consolidate environmental efforts to protect and enhance wetlands (primarily vernal pools) and upland habitats to provide ecologically viable conservation areas. It will also minimize regulatory hurdles and streamline the permitting process for development projects. The SSHCP is planned to cover 40 different species of plants and wildlife including ten that are state or federally listed as threatened or endangered. The SSHCP will be an agreement between state/federal wildlife and wetland regulators and local jurisdictions, which will allow land owners to engage in the incidental take of listed species (i.e., to destroy or degrade habitat) in return for conservation commitments from local jurisdictions. The options for securing these commitments are currently being developed and will be identified prior to the adoption of the SSHCP. The geographic scope of the SSHCP includes U.S. 50 to the north, Interstate 5 to the west, the Sacramento County line with El Dorado and Amador counties to the east, and San Joaquin County to the south. The Study Area excludes the City of Sacramento, the City of Folsom and Folsom's Sphere of Influence, the Sacramento-San Joaquin Delta, and the Sacramento County community of Rancho Murieta. Sacramento County is partnering with the incorporated cities of Rancho Cordova, Galt, and Elk Grove as well as the Sacramento Regional County Sanitation District and Sacramento County Water Agency to further advance the regional planning goals of the SSHCP.

Natomas Basin Habitat Conservation Plan

The Natomas Basin HCP (NBHCP) was approved in 2003 and has two permit holders: the City of Sacramento and Sutter County. The Natomas Basin is a low-lying, 53,537-acre area of the Sacramento Valley located in the northern portion of Sacramento County and the southern portion of Sutter County. The Natomas Basin Conservancy (TNBC) is the nonprofit entity responsible for administering and implementing the NBHCP. TNBC reports directly to the permit holders. The HCP covers 22 sensitive species.

Yuba-Sutter Natural Community Conservation Plan/Habitat Conservation Plan

The Yuba-Sutter NCCP/HCP is intended to provide an effective framework to protect and enhance agricultural and natural resources in Yuba and Sutter counties, while improving and streamlining the environmental permitting process for impacts on threatened and endangered species. The Yuba-Sutter NCCP/HCP will allow Yuba and Sutter counties, the cities of Wheatland, Yuba City, and Live Oak, and the Plan Implementing Entity to control threatened and endangered species permitting for activities and projects in specifically defined areas of the counties, encompassing approximately 440,000 acres. This NCCP/HCP will also serve to provide comprehensive species and ecosystem conservation and contribute to the recovery of threatened and endangered species in northern California. The Yuba-Sutter NCCP/HCP is planned to provide coverage for 17 species including 14 wildlife species and 3 plant species. The plan is currently under development with public drafts anticipated in mid-2012 and completion in 2013.

Yolo County Natural Community Conservation Plan/Habitat Conservation Plan

The Yolo County NCCP/HCP is currently in preparation. In February 2005, the Joint Powers Authority (five local public agencies formed to prepare a regional conservation plan for Yolo County) and the state Department of Fish and Game (DFG) entered into an NCCP/HCP Planning Agreement, now known as the Yolo Natural Heritage Program. The independent science advisor's report was finalized in March 2006. The NCCP/HCP planning area encompasses almost 400,000 acres and is planned to provide habitat for 28 sensitive species, including 13 state- and federally listed species (no fish species are covered).

Placer County Conservation Plan

Placer County, DFG, and U.S. Fish and Wildlife Service finalized an NCCP planning agreement in December 2001. The Placer County Conservation Plan (PCCP) is being prepared in three phases. Phase 1 is currently underway and covers 273,983 acres of the valley floor and low foothill portions of Placer County. Five plant and 28 wildlife species are proposed for coverage. The county is working to establish a process to review and evaluate interim projects in order to avoid foreclosing conservation options and receipt of desired permits.

El Dorado County Integrated Natural Resources Management Plan

El Dorado County General Plan Policy 7.4.2.8 and Implementation Measure CO-M direct the County to prepare and adopt an Integrated Natural Resources Management Plan (INRMP) to offset the impacts of loss and fragmentation of wildlife habitat from development authorized under the 2004 General Plan. In May, 2009, the county split the process of developing the INRMP into two phases. The first, an information gathering, mapping, and development of options process, was completed in April, 2011 with the submittal of the Options Report. Phase 1 also included a Habitat Inventory, developed a list of indicator species for monitoring purposes, evaluated wildlife movement corridors and constraints, and developed a discussion of alternatives approaches for development of the habitat protection strategy. Phase 2 is the development of the plan itself. This includes identification of the mitigation program, development of a funding mechanism, management strategies, and monitoring. The county is preparing a request for proposal to solicit bids from qualified firms to complete Phase 2 during 2012–13. Phase 2 will include CEQA analysis of the proposed plan.

Habitat and Agriculture

The relationship between habitat conservation and agricultural land can cut two ways. Parts of the region are experiencing a conversion of agricultural land to habitat preservation for development mitigation purposes, which can have the effect of removing land from agricultural use (and into habitat conservation) and sometimes creates difficulties for adjacent agricultural lands with the invasion of weeds, rodents, birds, and waterfowl. However, there can also be working relationships between the two land uses in which both needs can be met. Some examples include, but are not limited to: alfalfa is good foraging habitat for the Swainson's Hawk, while grazing helps keep non-native grasses in check and helps vernal pools function.

Yolo, Sacramento, and Placer counties are addressing this and planning for these working relationships in their habitat conservation plans (HCPs). Sutter and Yuba counties have begun developing a joint HCP that will also address these issues. Yolo and Sacramento county staffs indicate that some components of their HCPs will be dependent on agricultural land preservation for implementation; in Sacramento County as much as 90 percent is dependent on agriculture. Yolo County's General Plan includes Policy CO-1.17, which would allow out-of-county mitigation easements in Yolo County provided several criteria are met, including requirements that existing agricultural operations continue to be farmed for commercial gain and mandatory wildlife-friendly strategies and practices are followed. These issues highlight the struggles realized in agricultural and conservation lands. The pressures from development in many ways are mirrored by pressures from other non-urbanized lands.

In addition to their mitigation requirements for habitat lands, Yolo and El Dorado counties have mitigation policies specifically addressing the loss of agricultural land. Yolo County, for example, adopted an agricultural mitigation ordinance which requires all projects that result in a permanent loss of either farmland and/or habitat to mitigate an equal amount of land. Agricultural and habitat easements may not be stacked within the same property, and must be mitigated separately. The ordinance requires that agricultural conservation easements be located within two miles of the development that is being mitigated. The purpose of this is to give first protection priority to lands close to urban areas, which in Yolo County are viewed as higher risk for conversion to urban uses. Within Yolo County, the cities of Woodland and Davis also have agricultural mitigation requirements. The Yolo County Local Agency Formation Commission also requires agricultural mitigation (in lieu of an existing city requirement) when agricultural land is lost as a result of annexation.

Additional information about the biological and hydrological conditions in the plan area is included in Appendix E-4—Natural Resources Data.

Conservation and preservation efforts around the region and the processes described in this section have been considered in the development of this MTP/SCS. SACOG has coordinated closely with local cities and counties to ensure that the MTP/SCS land use pattern does not contradict or undermine efforts related to conservation at the local level. SACOG has made efforts to support this work at the local level, providing assistance at many levels when appropriate or needed. When these plans are finally adopted, they will be fully referenced in future MTP/SCS growth strategies.

The MTP/SCS includes a land use pattern and supporting transportation system that, while it impacts natural resources, is consistent with the locations identified for development in draft HCPs/NCCPs. Furthermore, new development areas were assessed for their federal and state permit status. Table 7.5 illustrates the impact of the MTP/SCS on natural resources by habitat/land cover type. The 37,681 acres of land use and transportation impact represent 1 percent of the 2,543,519 acres of habitat and land cover in the region today.

Table 7.5
MTP/SCS Land Use and Transportation Impacts to Wildland Habitat

Wildland Habitat/ Land Cover	Land Use Impacts	Transportation Impacts
Barren	215	17
Chaparral	1,208	19
Foothill Woodland	5,243	255
Grassland	20,133	3,148
Montane Forest	4,016	85
Open Water	345	13
Riparian	1,026	212
Riverine	46	28
Sagebrush Scrub	24	0
Valley Oak Savanna	866	32
Valley Oak Woodland	217	22
Wetland	421	90
Wildlands Total	33,760	3,921

Source: Yuba-Sutter HCP/NCCP, South Sacramento HCP/NCCP, Placer County Conservation Plan, Yolo HCP/HCCP, California Vegetation Maps for Northern Sierra and Central Valley ecological zone.

Six-County Aquatic Resources Inventory

In 2009, the U.S. Army Corps of Engineers (USACE), made an investment of just over $1,000,000 to inventory all waters within the six-county SACOG region. The request for this funding came not only from within USACE, but with the strong support of SACOG. The intended outcome of this investment from SACOG's perspective is to utilize the inventory (under review for a mid-2012 release) to prioritize areas of natural significance and streamline 404 permitting particularly in accordance with Blueprint and smart growth development. Additionally, SACOG has been and will remain engaged in ensuring that the inventory continues in its development of utility via coordination amongst its members in addition to facilitating coordination for the Corps of Engineers and their regulatory partners at both the federal and state levels. The inventory data are not yet available for use and are not expected to be available until mid- to late 2012. The data will be useful to member jurisdictions, and will be available for use in the next MTP/SCS update.

Water Resources

The balance between urban and rural land use and the management of those lands has a direct impact on the use and management of our water resources. Management of these resources are not only mandated by state and federal law, but critical to the sustainability of the region. In terms of water, the Sacramento region is positioned between a Sierra snowpack, the source of most of our surface water supply and which climate models predict will diminish in the future, and the Sacramento-San Joaquin Delta, which is in need of more fresh water from this region and beyond to help stabilize the decline of the estuary's ecosystem. Groundwater is plentiful in some areas, but challenged in others. From conservation to stormwater management to water quality, jurisdictions and water purveyors continue to use water management plans to ensure they balance demand and supply. This water balance effort extends to the entire region through Integrated Regional Water Management plans that also address issues such as adequate stream flow for habitat, groundwater recharge and flood control. Whether we are growing buildings or growing crops, water is a key factor that will shape the region's future. This section discusses water-related issues around the region, how they interact with the MTP/SCS, and what impacts development in the plan has on water resources.

Every county has a different profile of water use, but overall approximately 80 percent of developed water supply—water that is diverted from waterways or pumped from aquifers—is used for agriculture and 20 percent is for urban uses. Unlike agriculture's seasonal demand, urban areas need water throughout the year. This increases pressure on groundwater supplies to manage shortages. Despite the ability to pay for water delivery infrastructure in most urban areas, water supply limitations can still hinder urban development plans. Planning and management efforts are critical to achieving a sustainable water balance throughout the region. When development occurs, a source of water, and the infrastructure to deliver it, must be identified. SACOG coordinates with local jurisdictions to understand the water supply and infrastructure requirements of proposed development in creating the MTP/SCS land use forecast.

With more demand on water supplies, great efforts are being made to use water more efficiently. Water supply uncertainty is the byproduct of drought, court decisions, legislation, development, and possible climate change impacts. Preparing for the region's future requires strategies that not only secure water supplies, but also use the water that is available in a more efficient manner. This saves water and money, which helps urban and rural users meet their needs and still meet the needs for the environment. Urban Water Management Plans, Agriculture Water Management Plans, and Integrated Regional Water Management Plans—comprehensive, inter-jurisdictional studies of how to manage the supply and use of water for urban and non-urban uses—can improve the efficiency of water use and result in solutions that help all stakeholders. These plans, and efforts such as the Water Forum Agreement, employ best management practices to reduce water use for urban purposes. State-mandated conservation will also drive continued efforts to reduce urban water demand. In agriculture, drip irrigation has been used by farmers for a number of years and saves substantial amounts of water, energy and cost. Irrigation Management Services (IMS) use data collected from soil moisture sensors to customize irrigation schedules based on the crop and soil moisture conditions. These and other conservation efforts help reduce demand and costs and keep as many acres as possible supplied with water.

Often secondary in the thinking of many water planners, water quality regulations actually are a primary factor in how water is managed today and into the future. For urban water purveyors, threats to water quality are of paramount importance with regulatory requirements driving frequent monitoring and testing. Locally, the groundwater contamination from past practices on industrial properties, military bases and even corner gas stations has forced water managers to change sources of water, shut off wells and make significant investments in new infrastructure and treatment. As groundwater is pumped, managers must understand whether their actions exacerbate contamination or help contain it. Once water is used for many of our indoor needs, wastewater treatment plant operators have the task of cleaning the water of human and non-human wastes to meet standards for discharge. Fortunately, SACOG analysis shows that compact growth reduces water demand significantly. During the Blueprint process, SACOG estimated that new growth in the Blueprint would consume 30 percent less water than the Base Case scenario. These results suggest that compact growth will reduce demand for water and impacts on water treatment systems.

Flood Control

Four counties, Sutter, Yuba, Yolo, and Sacramento, have large floodplains along the Sacramento, Yuba, Feather, and American rivers and their tributaries. Flood control projects—dams and levees—have made it possible in these floodplains to develop not only urban areas, but also agricultural production. Some flood control plans include setting aside farmland to reduce the amount of land needing an urban level of protection in the future and thereby minimizing overall flood risk. Maintenance of many of the levees is the responsibility of reclamation districts, which in rural areas are funded by farm operations and related agricultural businesses. These and other flood management activities protect not only agricultural operations, but also wildlife areas and mitigation lands. Croplands also provide a buffer that helps protect urban areas by slowing flood flows and storing water. This water can recharge groundwater supplies and help minimize land subsidence. While agriculture and open space provide numerous flood benefits, in some cases, levee improvements may impact these lands within the basin being protected when levees are built over farmland. Additionally, farmland may be converted to habitat for required levee mitigation. At the same time, rural communities within the floodplain are prohibited from new construction and infrastructure improvements until they achieve an urban level of flood protection.

The majority of urban development in the SACOG region already exists within a floodplain; to achieve GHG emissions reductions, improve regional air quality, and maintain an efficient transportation system, some of the region's future urbanization will also occur within floodplains. Of the 303,000 new housing units forecasted by the MTP/SCS, 75,655 are expected to be constructed in a 200-year floodplain. The challenge for the region will be to continue balancing the need for flood protection with agricultural and environmental sustainability, and growing needs for providing urban development for a growing population. The timing of this forecasted development has been carefully evaluated to ensure that the additional growth occurs only after levees are projected to be certified by FEMA and consistent with state requirements.

In fact, due to both potential opportunity and conflict, SACOG has been and will remain substantively engaged with the White House Council on Environmental Quality (CEQ) as it updates the Principles and Guidelines for water and land related resources. In 2010, the Obama Administration expanded the scope of the 1983 Principles and Guidelines for Water and Land Related Resources. The first step in this significant process was the release of a draft report that emphasized that water resources projects should maximize sustainable economic development, avoid unwise use of floodplains, and protect and restore natural ecosystems, among other important points. In addition to the Principles and Guidelines, CEQ is also updating the Principles and Standards, the vehicle through which new policy will be implemented via an expanded collective of federal agencies.

SACOG recently updated its levee status report as part of the process of developing the land use plan for the MTP. The purpose of the report was to determine if any potential growth areas in floodplains might be delayed due to levee conditions and the jurisdiction's ability to improve their levees to meet federal and state requirements for flood protection. The report concludes that most growth areas are scheduled for levee upgrades to conclude before 2020. In particular, portions of Yolo County, West Sacramento and Sutter County have levee improvements that may result in delays of growth. This was reflected in the growth assigned to these areas in the MTP/SCS by 2020, and phasing of growth is in line with levee improvement schedules and levees being certified as being able to provide urban level of flood protection by FEMA. Both the levee status report and descriptions of the MTP/SCS 2020 and 2035 land use forecast are in Appendix E-3—Land Use Forecast Background Documentation. SACOG continuously monitors the status of this issue and if the situation changes in any of the areas from what is assumed in this plan, growth assumptions in future updates will be amended accordingly.

SACOG is also participating in the California Emergency Management Agency (Cal EMA) Working Group on Hazard Mitigation Planning to offer regional coordination for the next update of the Cal EMA State Hazard Mitigation Plan. This work is discussed in Chapter 10—Financial Stewardship.

Air Quality and Health

Air quality is an important part of the MTP/SCS due to the widespread consequences it has for both public health and the environment. With a projected population increase of 871,000 people by 2035, the region must rise to the challenge of meeting and maintaining state and federal health-based air quality standards. Transportation conformity provides the link between air quality and transportation planning; linking State Implementation Plans (SIPs) for air quality and the MTP/SCS. More prescriptively the SIPs in our region provide the strategies that will be used to attain and maintain National Ambient Air Quality Standards (NAAQS); the MTP/SCS through the conformity process determines that our land use and transportation implement this strategy.

Climate and Topology

The majority of the MTP/SCS plan area is located in the Sacramento Valley Air Basin (SVAB), a basin bounded by the Sierra Nevada Mountain Range to the east and the Coastal Mountain Ranges to the west. Topography in the SVAB is generally flat, with relief anywhere from slightly below sea level near the Sacramento-San Joaquin Delta to over 2,150 feet above sea level at the Sutter Buttes.

Hot dry summers and mild rainy winters characterize the Mediterranean climate of the SVAB. During the year the temperature may range from 20 to 115 degrees Fahrenheit with summer highs usually in the 90s and winter lows occasionally below freezing. Average annual rainfall is about 20 inches, with about 75 percent occurring during the rainy season, generally from November through March. The prevailing winds are moderate in strength and vary from moist clean breezes from the south to dry land flows from the north.

The mountains surrounding the SVAB create a barrier to airflow, which can trap air pollutants when certain meteorological conditions exist. The highest frequency of air stagnation occurs in the autumn and early winter when large high-pressure cells lie over the SVAB. The lack of surface wind during these periods and the reduced vertical flow caused by less surface heating reduces the influx of outside air and allows air pollutants to become concentrated in a stable volume of air. The surface concentrations of pollutants are highest when these conditions are combined with smoke or when temperature inversions trap cool air, fog and pollutants near the ground. The ozone season (May through October) in the SVAB is characterized by stagnant morning air or light winds, with the Delta breeze arriving in the afternoon out of the southwest. In addition, longer daylight hours provide a plentiful amount of sunlight to fuel photochemical reactions between reactive organic gases (ROG) and oxides of nitrogen (NO_X), which result in ozone formation.

As an air basin, air quality in the Sacramento region is impacted not only by pollutants generated within the region, but also by pollutants generated in the San Francisco Bay Area, which are carried into the Sacramento region by Delta breezes. The effect of pollutants transported from the San Francisco Bay Area or from the San Joaquin Valley on air quality in the Sacramento region can vary from substantial to inconsequential on any given day, largely determined by accompanying meteorological conditions. Thus, the success of the Sacramento region in attaining better air quality is partially contingent on the achievement of better air quality in nearby areas that affect Sacramento's air quality.

Attainment Status in The Region

The Sacramento Air Quality Maintenance Area (AQMA) is comprised of five air districts in the southern portion of the SVAB. Various portions within this area have been classified as either attainment or nonattainment for NAAQS and CAAQS. There are four pollutants monitored in the AQMA, which are ozone, particulate matter with a diameter of less than 10 micrometers (PM_{10}), particulate matter with a diameter of less than 2.5 micrometers ($PM_{2.5}$), and carbon monoxide (CO); see below for additional detail. The AQMA is in nonattainment status for ozone, PM_{10}, and $PM_{2.5}$, and is classified as a maintenance area for CO.

Ozone

The Sacramento Metropolitan Area is designated a severe nonattainment area for the eight-hour NAAQS for ozone. The area was previously a serious nonattainment area for ozone until the five local air districts requested to be reclassified as severe-15 in February 2008. The request for a voluntary bump-up in classification was in recognition of the fact that the Sacramento Metropolitan Area must rely on longer-term reduction strategies to meet the ozone attainment goal. The use of longer-term reduction strategies should have lasting effects, though it called for the extension of the original attainment deadline from 2013 to 2018. The nonattainment area for ozone is comprised of Sacramento County, Yolo County, the southern portion of Sutter County, the eastern portion of Solano County, and the portions of El Dorado and Placer counties west of the Tahoe Basin.

Included in the *2009 Sacramento Regional 8-Hour Ozone Attainment and Reasonable Further Progress Plan* were 43 transportation control measures (TCMs) for the Sacramento Region. TCMs are strategies for reducing vehicle trips, vehicle use, vehicle miles traveled, vehicle idling, or traffic congestion for the purpose of reducing motor vehicle emissions. SACOG worked with local governments and local air districts to develop the proposed TCMs. TCMs include public transit, carpooling and vanpooling, bicycling and pedestrian enhancement, and land use programs. One of the successful TCMs is The "Spare the Air" program.

A full list of TCMs and the implementation status of these TCMs is available in Appendix F-1—Conformity Determination for the MTP/SCS.

Carbon Monoxide

The area monitored for carbon monoxide (CO) levels was re-designated as a maintenance area in the California Air Resources Board (ARB) document *1996 Carbon Monoxide Maintenance Plan for 10 Federal Planning Areas*. The area has reduced emissions to acceptable amounts in accordance with the proposed budget of CO emissions as included in the *2004 Amendment to the California State Implementation Plan for Carbon Monoxide*. The maintenance area for CO includes the urbanized portions of Placer, Yolo, and Sacramento counties.

Particulate Matter 10 (PM_{10})

The United States Environmental Protection Agency (U.S. EPA) designated Sacramento County as a moderate nonattainment area for PM_{10} in 1994, though a redesignation request to classify Sacramento County as a maintenance area for PM_{10} is pending U.S. EPA approval. The area monitored for PM_{10} consists solely of Sacramento County, although the four remaining air districts in the Sacramento region are designated nonattainment for the state AAQS and unclassified/attainment areas for the federal AAQS. Sacramento County attained the PM_{10} NAAQS by the attainment deadline of 2000 and has been demonstrating maintenance since then. In recent years there have been no exceedances. On November 18, 2010, the ARB approved the PM_{10} Implementation/Maintenance Plan and Redesignation Request for Sacramento County. The plan shows that the 1987 standard for PM_{10} was attained and establishes the strategy for maintaining the standard through 2022. U.S. EPA has yet to act on the redesignation request to classify Sacramento County as a maintenance area for PM_{10}.

Particulate Matter 2.5 ($PM_{2.5}$)

The third nonattainment designation within the AQMA is for $PM_{2.5}$. U.S. EPA changed the 24-hour standard for $PM_{2.5}$ from 65µg/m^3 to 35µg/m^3 in 2006. The area failed to meet the new standards and was consequently designated a $PM_{2.5}$ nonattainment area in 2009. The area currently monitored for $PM_{2.5}$ includes all of Sacramento and Sutter counties, the western portions of Placer and El Dorado counties, the southern majority of Yuba County, the eastern half of Yolo County, and portions of Solano County. Beginning in 2012, efforts to produce a State Implementation Plan for $PM_{2.5}$ will initiate. Planning assumptions to develop the emission budgets for this SIP will be derived from the VMT and population data used to develop the MTP/SCS. This will be a future collaborative effort between SACOG and the various AQMDs/AQMAs in the region.

Details of Pollutants in the Region and Their Health Impacts

Ozone (O_3)

Ozone (O_3) is a nearly colorless, odorless gas which irritates the lungs and damages materials and vegetation. Ozone pollution is created by chemicals that come from many sources, including mobile sources such as automobiles, buses, heavy duty trucks, light trucks, trains, construction vehicles, farm vehicles, airplanes, motorcycles, boats, and dirt bikes. Ozone is a major component of smog in the Sacramento region, and results from the photochemical reaction of ozone precursors, reactive organic gases (ROG) and nitrogen oxide (NOx) in the presence of sunlight and heat. Although ozone is the air contaminant for which standards are set, ROG and NOx are the pollutants that must be controlled.

Ozone interferes with the photosynthesis process necessary for plant growth, reducing forest and crop growth. Thus, ozone pollution poses a danger to agricultural economies that depend on stable conditions. In addition to the effect on economies reliant on natural resources and crops, ozone deteriorates the appearance of local, state, and national parks in the Sacramento region by damaging the vegetation. The effects of ozone on health have also been studied by health researchers, who have found that exposure to ozone can cause decreases in lung function, and repeated exposure can result in permanent lung damage. Symptoms of lung disease may also be related to repeated exposure to ozone concentrations above current standards. Ozone reduces resistance to colds and pneumonia, and aggravates heart disease, asthma, bronchitis, and emphysema. Irritation from ozone pollution also manifests as wheezing, coughing, and irritation of the airways.

Nitrogen Dioxide (NO_2)

NO_2 is a highly reactive, reddish-brown gas that, at high levels, can cause breathing difficulties. It is formed when nitric oxide (pollutant produced from burning processes) combines with oxygen. It contributes to smog formation and causes the brown haze seen on cold mornings. NO_2 pollution is most severe close to roadways and in vehicles; consequently, area-wide pollution monitors often show a considerably lower reading of NO_2 pollution than readings collected beside active roadways. NO_2, when combined with nitric oxide (NO), forms nitrous oxide (NOx), a precursor to ozone. Therefore, reducing the amount of NO_2 created will also decrease the amount of ozone created.

NO_2 has an adverse effect on the respiratory system of humans, with exposure causing inflammation of the airways in people without a respiratory condition, and aggravated symptoms in people with asthma or other respiratory conditions. Children, the elderly population, people suffering from respiratory conditions, and people who exert energy through working or exercising outside are most sensitive to the effects of NO_2 pollution.

Particulate matter (PM)

PM refers to finely divided solids or liquids such as soot, dust, aerosols, and mists. PM is largely the result of human activities, such as residential fuel combustion smoke and soot, grading and excavation activities, agriculture (as created by soil preparation activities, fertilizer and pesticide spraying, weed burning, and animal husbandry), and from motor vehicles, particularly diesel-powered vehicles. Suspended particulates aggravate chronic heart and lung disease problems, produce respiratory problems, and often transport toxic elements such as lead, cadmium, antimony, arsenic, nickel, vinyl chloride, asbestos, and benzene compounds. Suspended particulates also absorb sunlight, producing haze and reducing visibility.

Particulate matter 10 (PM_{10})

Respirable particulate matter (PM_{10}) consists of small particles, less than 10 microns in diameter, of dust, smoke, or droplets of liquid which penetrate the human respiratory system and cause irritation by themselves or in combination with other gases. PM_{10} pollution can result in damage to vegetation, but the focus is generally placed on the adverse health effects of particulate matter. PM_{10} causes a greater health risk than larger particles, since these fine particles are too small for the natural filtering process of the human body and can more easily penetrate the defenses of the human respiratory system.

Controlled human exposure studies have shown that exposure to elevated levels of particulate matter causes adverse health effects, especially regarding the inhibition of lung functions and an increase in respiratory and cardiovascular afflictions, as well as cancer risks. Individuals with pre-existing respiratory or cardiovascular disease are especially susceptible to the adverse effects of PM_{10} exposure, as are asthmatic children and the elderly population.

Particulate matter 2.5 (PM2.5)

Fine particulate matter ($PM_{2.5}$) consists of small particles, which are less than 2.5 microns in size. Similar to PM_{10}, these particles are primarily the result of combustion in motor vehicles, particularly diesel engines, as well as from industrial sources and residential/agricultural activities such as burning. $PM_{2.5}$ is also formed through the reaction of other pollutants. As $PM_{2.5}$ is smaller than PM_{10}, it can more deeply penetrate the human body through inhalation, allowing allow many chemicals harmful to human health to be carried to internal organs. These particulates can increase the chance of respiratory disease, cause lung damage, cancer, and even premature death in people with heart or lung disease.

Carbon Monoxide (CO)

CO is a highly toxic, odorless, colorless gas which is primarily produced by the incomplete combustion of carbon-containing fuels (vehicular exhaust from tailpipes). CO is a local pollutant that creates individual hot spots, or small areas where CO concentrations are high. CO is mostly a wintertime problem in the Sacramento urbanized area which is currently in attainment of the CO standard. CO affects human health by binding to hemoglobin in the bloodstream in the place of oxygen molecules. By reducing the oxygen-carrying potential of blood, CO causes heart difficulties in people with chronic diseases, reduces lung capacity, impairs mental functioning by interfering with the transfer of oxygen to the brain, and may aggravate arteriosclerosis. CO air contamination can result in death if quantities are extremely high.

Sources of Air Pollution

Release of air pollutants, like those described above, comes from almost all human activities, including industrial facilities, dry cleaners, automobiles, auto body shops, trucks, trains, lawn movers, bakeries, farm equipment, paints, paving, printing, airplanes, construction equipment, refining, and agricultural activities. Some sources emit large amounts of the pollutants that cause ozone but only small amounts of CO or particulate matter, while others emit large amounts of all three.

Emissions are normally grouped into four main categories; stationary, area-wide, mobile, and natural sources. Generally, stationary and area-wide sources are those attached to the ground, while mobile sources are those involved in the movement of people and goods. Natural emission sources refer to emissions that are non-anthropogenic (non-human-caused) sources. Each of these categories is usually further divided into major source categories and then summary categories. A brief description of these four main categories is listed below.

Stationary Emission Sources

Stationary source emissions, also referred to as point source emissions, are emissions from major industrial, manufacturing and processing plants. This category also includes emissions from electric utilities; waste burning; solvent use; petroleum processing, storage and transfer; and industrial processes.

Area-wide Emission Sources

Area sources are those that individually emit only small quantities, but collectively result in substantial emissions when aggregated over a larger area. Emissions result from landscaping; natural gas consumption; small industrial engines; solvent use in dry cleaning, auto repair, auto body shops and paints; wood burning; industrial coatings; consumer products; printing; bakeries and restaurants; asphalt paving; and fugitive dust (i.e., small airborne particles that do not originate from a specific point).

Mobile Emission Sources

There are two major categories under mobile emissions:

On-road Motor Vehicles: This major source category accounts for the emissions from all vehicles licensed to travel on public roads and highways. This includes passenger cars, light- and medium-duty trucks, heavy-duty gas and diesel trucks, heavy-duty urban diesel buses, and motorcycles.

Other Mobile Sources: This major category accounts for vehicular emissions from: construction equipment, farm tractors, off-road recreational vehicles, trains, ships, aircraft, mobile equipment, utility equipment, and lawn mowers.

Natural (Non-anthropogenic) Sources

This category accounts for emissions from non-anthropogenic sources such as: wildfires, agricultural vegetation, and petroleum seeps.

Attainment Status and the MTP/SCS

The link between the MTP/SCS and existing SIPs, as mentioned above, is transportation conformity. Consistency is the core of a conformity determination. Transportation activities must be consistent with the emission reduction requirements in the SIP that, when implemented, will contribute to the efforts in the SACOG region to attain NAAQS. Specifically, the MTP/SCS cannot result in new violations of the NAAQS, increase frequency/severity of NAAQS violations, or delay timely attainment of the NAAQS.

The MTP/SCS was developed with consideration of balancing the objectives of meeting the air quality standards for the region, future transportation and land use needs, and the projected population increase of approximately 871,000 people by 2035. This was done through close analysis of the interface of future transportation and land use in the region. The location and pattern of growth is important because it determines travel behavior and provides a means for determining the impact of future vehicle emissions in the MTP/SCS planning area. A compact growth pattern served by an efficient transportation system provides the foundation to reduce automotive travel and increase walking, bicycling and transit use, which reduce individual vehicle trips and associated VMT. Reduced VMT and vehicle trips are linked to reduced regional criteria pollutant emissions. By focusing on providing more small lot and attached housing, maximizing infill and redevelopment opportunities, and planning for communities with a mix of uses, the MTP/SCS creates a more compact land use pattern. This emphasis toward more compact development and reduced VMT and trips is a necessary part in growing our region while at the same time improving our air quality and the health of those in our region.

Toxic Air Contaminants

As described above, the location and pattern of growth is important because it determines travel behavior and provides a means for determining the impact of future vehicle emissions in the MTP/SCS planning area. However, in order to achieve the greatest VMT reductions from a compact growth pattern, development needs to be situated near public transit corridors, which, in the SACOG region are typically near major roadway corridors. As a result, transit-efficient compact development can inherently result in closer proximity of receptors to localized sources of TACs.

Although ambient air quality standards exist for criteria pollutants, no ambient standards exist for air toxics. Many pollutants are identified as air toxics because of their potential to increase the risk of developing cancer or because of the acute or chronic health risks that may result from exposure to these substances. For air toxics that are known or suspected carcinogens, ARB has consistently found that there are no levels or thresholds below which exposure is risk free. Individual air toxics vary greatly in the risk they present—at a given level of exposure, one air toxic may pose a hazard that is many times greater than another. For certain air toxics, a unit risk factor can be developed to evaluate cancer risk. For acute and chronic health risks, a similar factor called a Hazard Index is used to evaluate risk.

Air toxics are a form of particulate matter pollutant that are increasingly being studied and added to the list of impacts of the transportation system to health. Air toxics are released from sources throughout the country, including motor vehicles, stationary sources such as industrial/manufacturing plants, and area sources such as dry cleaners and auto paint shops. Several air toxics are emitted during combustion of gasoline and diesel fuel by motor vehicles, including benzene, formaldehyde, 1,3-butadiene, and particulate matter from diesel exhaust. Of these emitted toxics, particulate matter from diesel exhaust—such as emissions from freeways, distribution centers, railyards, and ports—represents the greatest health risk. Air toxics other than those primarily associated with diesel exhaust are still considered significant, even if they do not appear to greatly contribute to the overall risk level of the region. Those air toxics can present a high risk to members of the population in close proximity to a source of the pollutant.

Though U.S. EPA issued a Mobile Sources Air Toxics (MSAT) Rule in 2001, and issued a second MSAT Rule in 2007, no set standards for air toxics were identified. Because there is no regulatory setting for air toxics at this time that the MTP/SCS must comply with, the evaluation of their impact is more qualitative. Standards and regulations are in place to reduce air toxics emissions using the base level emissions level as a starting line, instead of aspiring to a scientifically prescribed level of acceptable emissions. ARB uses a similar approach, with the long-term goal of their statewide control program being to reduce diesel PM by 80% by 2020; requiring cleaner diesel fuel and cleaner

diesel engines are two standards being employed to reduce the public's exposure to diesel PM. There is no consensus on thresholds for exposures for sensitive people or proximity of their sensitive land uses from pollutant sources. Guidelines and recommended practices are being applied while more information and appropriate policies are being developed.

ARB's *Air Quality and Land Use Handbook: A Community Perspective* (April 2005) identifies sensitive land uses—new residences, schools, day care centers, playgrounds, and medical facilities—that should receive additional consideration during land use discussions. It also identifies the segments of the population most susceptible to the non-cancer health risks from air toxics exposure: children, pregnant women, the elderly, and those with existing health problems are most vulnerable to the effects of air toxics, with evidence pointing to increased sensitivity among children to cancer-causing chemicals. Within the guidance are recommended buffers to be considered when siting new sensitive land uses. The identified sources include: high-traffic freeways and roads, distribution centers, railyards, ports, refineries, chrome planting facilities, dry cleaners using perchloroethylene, and large gasoline dispensing facilities. Each of these individual sources has recommended buffers related to their siting near sensitive land uses.

Specifically, the ARB handbook states that sensitive land uses (e.g., homes, schools, day care centers, parks, hospitals) be located outside a 500-foot buffer of major roadways, defined as freeways or urban roads with traffic volumes of 100,000 or more vehicles per day or rural roads with 50,000 or more vehicles per day. As of 2008, the population within the buffer zone represents only 2.02 percent of the entire region's population. By 2035, the population within the buffer zone will represent only 2.4 percent of the entire region's population (see Table 7.6). This means that less than half a percent (.38 percent) increase in the expected population will be within these buffer zones. Figure 7.4 shows the location of high-volume roadways in 2035.

Table 7.6
Population within 500-Foot Buffer of High-Volume Roadways, 2008 and 2035

County	2008 % of total population	2035 % of total population
El Dorado	0.26%	0.26%
Placer	1.30%	1.02%
Sacramento	2.73%	3.34%
Sutter	0.00%	0.00%
Yolo	1.23%	1.89%
Yuba	0.00%	0.00%
Region Total	2.02%	2.40%

Source: SACOG, 2011.

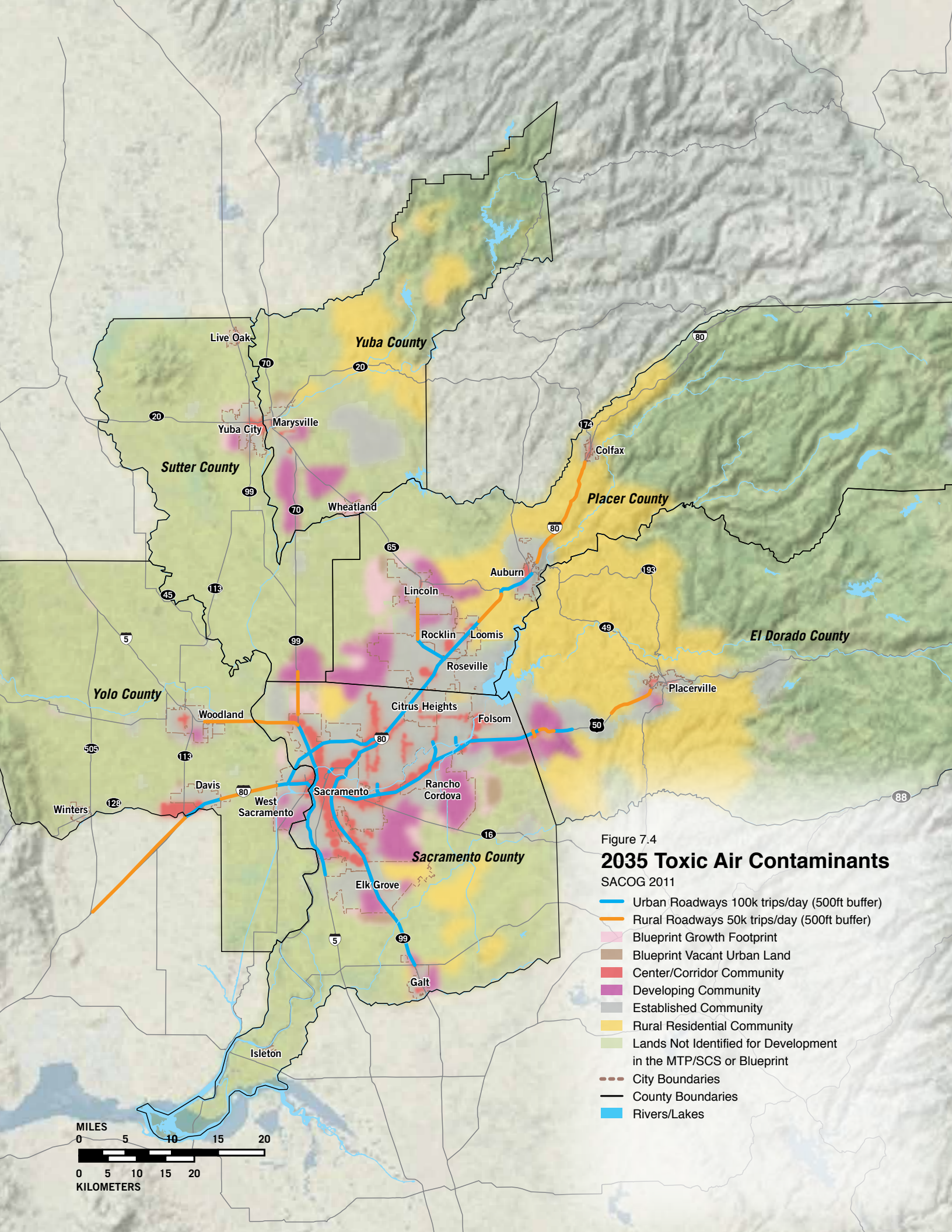


Figure 7.4

2035 Toxic Air Contaminants

SACOG 2011

- Urban Roadways 100k trips/day (500ft buffer)
- Rural Roadways 50k trips/day (500ft buffer)
- Blueprint Growth Footprint
- Blueprint Vacant Urban Land
- Center/Corridor Community
- Developing Community
- Established Community
- Rural Residential Community
- Lands Not Identified for Development in the MTP/SCS or Blueprint
- City Boundaries
- County Boundaries
- Rivers/Lakes

Figure 7.5 shows the location of the existing facilities that emit TACs for which locational data were available via permit or available data.

In addition to the 2005 ARB handbook, a statewide discussion has been taking place among affordable homebuilders, equity advocates, and public health experts seeking to better understand the relationship between infill development and public health.

At the local level, the Sacramento Metropolitan Air Quality Management District (SMAQMD) has developed its own protocol, *Recommended Protocol for Evaluating the Location of Sensitive Land Uses Adjacent to Major Roadways* (March 2011), for project developers to use in assessing potential risks to residents from siting in particular locations, and mitigation strategies to address any identified risks. As illustrated by the ARB handbook and SMAQMD protocol, the risk is highly site-specific. The height of nearby freeways, prevailing winds, and other factors can make a significant difference in whether potential development
sites pose elevated risks. Risks are different for children, seniors and those with certain health conditions than for healthy adults, and are based on a standard 70-year exposure, although many people do not necessarily live in the same location for 70 years. SACOG, through discussion and research, has identified a number of considerations for assessing exposure to high-volume roadway toxic air contaminants:

- SACOG does not have the capacity to assess every individual site within the buffer zone for potential variations in risk, but the local project proponents are expected to conduct assessments on a project-by-project basis to assess risk for planned residents or users.
- There are tradeoffs between the health benefits and risks of siting new residential development in infill areas near transit, which often runs on major roadway corridors. Risks of exposure to toxic air contaminants from proximity to high-volume roadways may need to be weighed along with such benefits as better transit access to health care, lower transportation costs that leave more money for medical care, and new higher quality housing and increased physical activity for residents that can help improve health. .
- State and federal agencies provide points in competitive housing funding programs for affordable home developments near frequent transit, recognizing that lower income residents tend to be more transit-dependent.
- Both environmental justice and non-environmental justice areas have small populations within the buffer zone. It is likely that what proximity there is includes more than low-income and minority residents, because populations in the buffer zone are likely to be diverse in ethnicity and income level, especially by 2035. For a full discussion on this population please see Chapter 8—Equity and Choice.
- Perchloroethylene is due to be phased out of dry cleaning operations by 2023.
- Increasingly cleaner vehicles are reducing some of the health risks from air contaminants. Strategies exist to mitigate risks include: siting residences and sensitive receptors away from the roadway, reducing windows facing the freeway or roadway, installing central heating and air conditioning systems, and planting trees that filter out air contaminants. Given the site-specific nature of exposure risk and available mitigation strategies, it is likely that the population that may experience exposure risk is even less than the 2 percent of the population in SACOG's analysis.

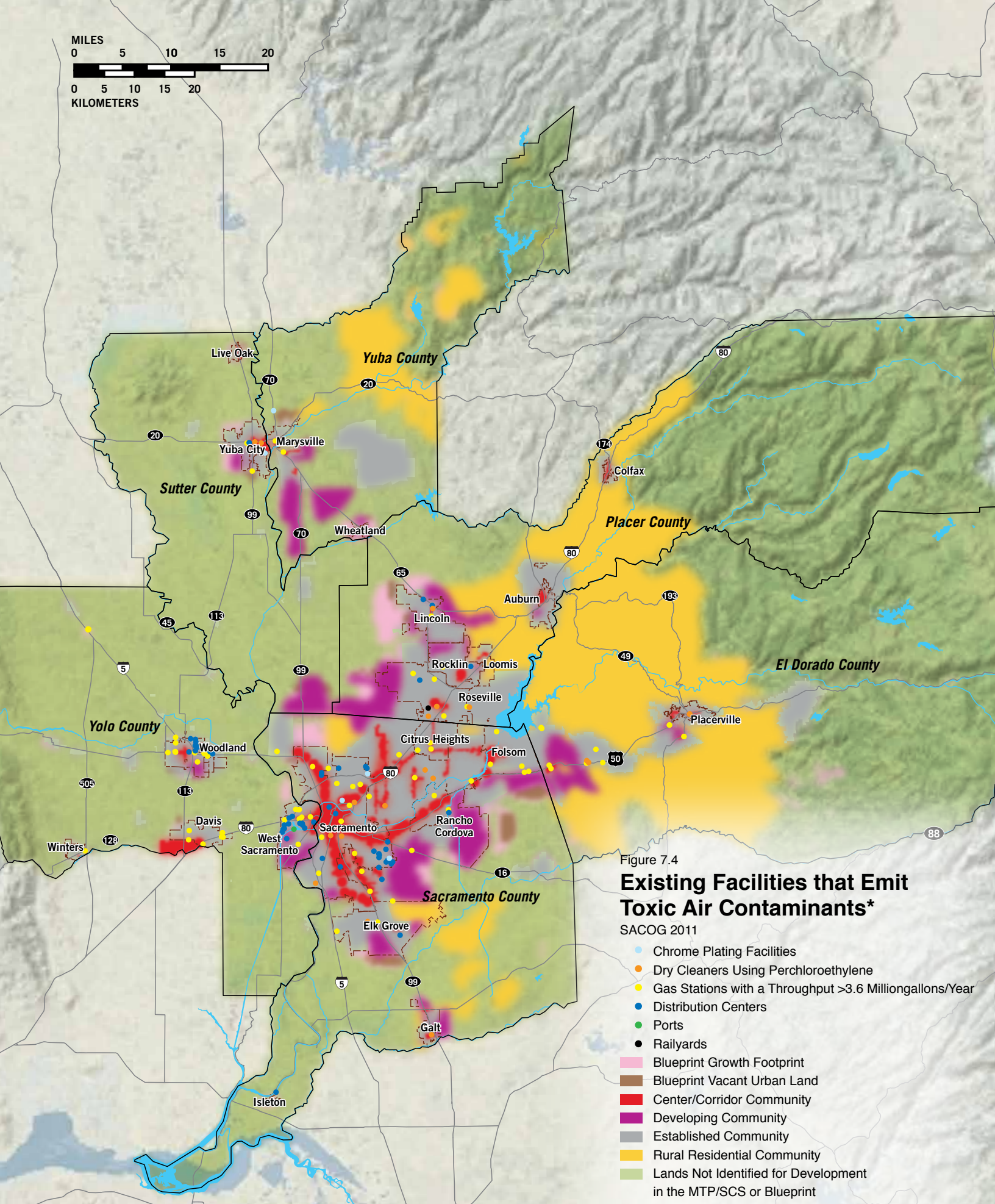


Figure 7.4

Existing Facilities that Emit Toxic Air Contaminants*

SACOG 2011

- Chrome Plating Facilities
- Dry Cleaners Using Perchloroethylene
- Gas Stations with a Throughput >3.6 Milliongallons/Year
- Distribution Centers
- Ports
- Railyards
- Blueprint Growth Footprint
- Blueprint Vacant Urban Land
- Center/Corridor Community
- Developing Community
- Established Community
- Rural Residential Community
- Lands Not Identified for Development in the MTP/SCS or Blueprint
- City Boundaries
- County Boundaries
- Rivers/Lakes

*Chemicals that cause serious health and environmental hazards are referred to as air toxics. SACOG identified sources of air toxics using the definition included in ARB's 2005 document "Land Use and Air Quality Handbook: A Community Health Perspective."

Climate Change: Mitigation and Adaptation

The integrated approach to reducing the effects GHG emissions have on climate change is one that SACOG takes seriously. SACOG has been involved in many aspects related to climate change throughout the region, including involvement in many climate action plans adopted or underway in the region. SACOG has conducted its own operational emissions inventory since 2006; was the first American organization to apply the Greenhouse Gas Regional Inventory Protocol (GRIP) model that culminated in a regional inventory and future year GHG inventory scenarios (see Appendix E-7); has received grants to work on planning for plug-in electric vehicle infrastructure; and has worked at reducing VMT, minimizing the impacts of GHG emissions on our climate, and realizing many of the benefits an MTP/SCS has to offer. For this MTP/SCS, SACOG has conducted extensive research on what factors lead to climate change, how it impacts human health, the environment, and economy, and what components of the MTP/SCS can help to minimize the effects climate change will have on the region.

Causes and Effects of Climate Change

Climate change is a measurable change in the state of the average weather conditions over a period of time, usually decades or longer[1]. A growing body of scientific research has linked climate change to an increase in the concentration of GHGs in the Earth's atmosphere. Concentrations of atmospheric GHGs has remained relatively constant up until the last two hundred years at between 260 and 285 parts per million[2]. Current levels of atmospheric GHGs exceed 390 parts per million[3].

Part of this fluctuation is caused by the natural carbon cycle. Absorption and release of GHGs by the oceans, plants, and the atmosphere is a natural occurrence. However, the Energy Information Administration (EIA) estimates that there are 6 billion metric tons of GHG emissions annually from human activity, and while some of this is absorbed by the carbon cycle, roughly 3 billion metric tons are released into the atmosphere each year[4]. While there is uncertainty on how the variation in climate is impacted by this increase in human-produced GHG emissions, it is believed that any increase in GHG concentrations in the atmosphere can increase global temperatures, which can have an impact on weather conditions around the globe.

In the United States, roughly 82 percent of all GHG emissions come from the use of petroleum and natural gas. This equals about 25 percent of global emissions. According to an EIA report, world energy consumption will increase by 47 percent from 2007 to 2035. This increase will be led by the use of liquid fuels, including petroleum and natural gas. Worldwide demand for oil is growing steadily. Current world oil usage is about 90 million barrels per day, with demand rising to around 111 million barrels per day by 2035[5].

The U.S. consumed approximately 19.1 million barrels of petroleum-based products per day in 2010. This is expected to increase to 21.9 million barrels per day in 2035[6]. Most of the increase in oil demand comes from the transportation sector, where there are the fewest available alternatives to petroleum. Roughly 70 percent of the U.S. oil consumption is in the transportation sector (14 million barrels per day)[7]. In California, petroleum-based fuels account for 43 percent of all energy consumption, and 39 percent of that is for transportation[8]. Over the last 20 years, California's consumption of gasoline and diesel fuel increased 50 percent. However, with recent state and federal regulations on fuel efficiency and alternative fuel sources, transportation-related fuel consumption is projected to decrease 3.7 percent by 2030.[9]

Carbon dioxide (along with water) is the natural end product of the clean burning of petroleum fuels, so the only way to reduce the influence on global climate is to reduce the amount of fuel burned, or to find a new fuel for vehicles that does not come from oil. Even carbon emissions from cleaner sources such as natural gas, ethanol, or electricity (unless derived from a renewable source) play a role in global warming. It is widely accepted that carbon dioxide forms approximately 84 percent of all GHG emissions; this is true in California as in the rest of the world.

The impacts from a change in global climate can be felt throughout the region. California has adopted the public policy position that global climate change is "a serious threat to the economic well-being, public health, natural resources, and the environment of California." Health and Safety Code § 38501 states that:

> *the potential adverse impacts of global warming include the exacerbation of air quality problems, a reduction in the quality and supply of water to the state from the Sierra snowpack, a rise in sea levels resulting in the displacement of thousands of coastal businesses and residences, damage to marine ecosystems and the natural environment, and an increase in the incidences of infectious disease, asthma, and other hu-*

1 Intergovernmental Panel on Climate Change, Annex I—Glossary, http://www.ipcc.ch/pdf/glossary/ar4-wg1.pdf

2 California Climate Change Portal, http://www.climatechange.ca.gov/background/index.html

3 Thomas Conway and Pieter Tans, NOAA/ESRL, www.esrl.noaa.gov/gmd/ccgg/trends/

4 Energy Information Administration, http://www.eia.gov/oiaf/1605/ggccebro/chapter1.html

5 Ibid

6 Energy Information Administration, Annual Energy Outlook 2011

7 Ibid

8 Energy Information Administration, California State Energy Profile 2009

9 Ibid

man health-related problems … [and that] … global warming will have detrimental effects on some of California's largest industries, including agriculture, wine, tourism, skiing, recreational and commercial fishing, and forestry (and)…will also increase the strain on electricity supplies necessary to meet the demand for summer air-conditioning in the hottest parts of the State.

The United Nations Intergovernmental Panel on Climate Change (IPCC) constructed several GHG emission scenarios of varying demographic, social, economic, technological, environmental, and policy futures. They concluded that GHG emissions at or above current levels would cause "many changes in the global climate system during the 21st century that would very likely be larger than those observed during the 20th century" (IPCC 2007).

The California Environmental Protection Agency (CalEPA) took the IPCC work and built scenarios specific to California. As directed by Executive Order #S-3–05, CalEPA prepared a series of reports, including the *Scenarios of Climate Change in California: An Overview* (Climate Scenarios report), in February 2006. This report analyzed the impacts the following temperature ranges could have on California during the 21st century: lower warming range (3.0–5.5°F); medium warming range (5.5–8.0°F); and higher warming range (8.0–10.5°F). It considered impacts on public health, water resources, agriculture, forests and landscapes, and rising sea levels. These impacts are discussed in detail below.

Public Health

Higher temperatures would create additional, longer, and more intense climate conditions leading to increased air pollution. An increase in global background ozone levels, as predicted in some scenarios, would make it impossible to meet local air quality standards. Large wildfires could become up to 55 percent more frequent, further increasing air pollution.

Under the higher warming scenario, in Sacramento there could be up to 100 more days per year with temperatures above 95°F by 2100. Rising temperatures will increase the risk of death from dehydration, heat stroke/exhaustion, heart attack, stroke, and respiratory distress caused by extreme heat. It will also result in more GHG emissions from increased energy consumed from the use of air conditioners.

Water Resources

Rising temperatures, especially if combined with decreases in precipitation, would severely reduce spring snow pack, increasing the risk of summer water shortages. Also, an influx of saltwater would degrade California's estuaries, wetlands, and groundwater aquifers. Saltwater intrusion caused by rising sea levels is a major threat to the quality and reliability of water within the southern edge of the Sacramento-San Joaquin River Delta, a major state fresh water supply.

Agriculture

As temperatures rise, there will be more demand for water for crops and a less reliable water supply. Increases in pests and disease in crops will compound the problem as rising temperatures will likely aggravate ozone pollution, which makes plants more susceptible.

Plant growth tends to increase with rising temperatures. However, faster growth can result in less-than optimal development for many crops, so rising temperatures are likely to worsen the quantity and quality of yield for a number of California's agricultural products. Products likely to be most affected include wine grapes, fruits, nuts, and milk.

Forests and Landscapes

Global climate change is expected to intensify this threat by increasing the risk of wildfire and altering the distribution and character of natural vegetation. If temperatures rise into the medium warming range, the risk of large wildfires in California could increase by as much as 55 percent, which is almost twice the increase expected if temperatures stay in the lower warming range. In the Sacramento region, the areas most at risk are the foothills in El Dorado, Placer and Yuba counties, and the foothills of western Yolo County.

Moreover, continued global climate change will alter natural ecosystems and biological diversity within the state. The productivity of the state's forests is also expected to decrease as a result of global climate change.

Rising Sea Levels

Rising sea levels, more intense coastal storms, and warmer water temperatures will increasingly threaten the state's coastal regions. Under the higher warming scenario, sea level is anticipated to rise 22 to 35 inches by 2100. Elevations of this magnitude would inundate coastal areas with saltwater, accelerate coastal erosion, threaten vital levees and inland water systems, and disrupt wetlands and natural habitats.

Addressing the Effects of Climate Change

To reduce the negative effects that fossil fuel consumption has on climate change, two themes emerge. First, advances in technology such as cleaner engines, better gas mileage, and the use of alternative fuels have the potential to slow the effects of climate change. However, there is a worry that the shift to more energy-efficient vehicles will occur too slowly to avoid potentially significant crises that will challenge the transportation system. This leads to the second theme: changing travel behavior. If people shift to greater use of alternative modes (transit, bicycling and walking), the reliance on oil and the negative effect on the climate is reduced. With these questions in the forefront of the planning process, the MTP/SCS was developed using a multi-faceted approach to reduce the consumption of energy sources that lead to increased GHG emissions and climate change.

Moving Cooler was a landmark study looking at the impacts certain transportation-related strategies could have on curbing GHG emissions. It looks at different approaches individually to determine what works and why, and combines them to get an overall sense of the relationship between travel and climate change. The study finds that the best approach to addressing the effects of travel on climate change is an integrated, multi-strategy approach that considers policies at different levels, travel behavior, and overall efficiency of travel[10]. This section will explore various efforts underway at the state and regional level that take this same approach, and in particular, what the MTP/SCS does in regard to travel activity and efficiency.

Policy Approach

California has already passed landmark laws, AB 32 and SB 375, intended to curb GHG emissions. When creating the MTP/SCS, SACOG made every effort to meet and surpass the goals outlined by both these laws. SB 375 is an implementation measure of AB 32, and creates specific targets that each region throughout California must try to meet. AB 32, on the other hand, does not direct SACOG to achieve any GHG emission reduction but instead sets statewide goals. However, the MTP/SCS were developed to not only achieve the goals of SB 375, but create an efficient land use plan and robust transportation network that would meet AB 32 goals and further reduce our impact on climate change.

AB 32

AB 32 calls for the state of California to reach 1990 levels of GHG emissions from all sources by the year 2020. It places California as the leader in the abatement of climate change and offers a model for other states and countries to reduce GHG emissions. As part of AB 32, in 2008, ARB created the Scoping Plan[11], which contains strategies to reduce GHG emissions. The Scoping Plan uses various actions including regulations, incentives, and market mechanisms to achieve reduction targets. In 2011, ARB approved an update of the expected GHG reductions from each of the measures outlined in the Scoping Plan document. Table 7.7 outlines GHG emissions, expressed in million metric tons of CO_2 equivalents (MMtCO2e) and the expected reductions from each. The table includes reduction measures from transportation, and electricity and natural gas sources that will be covered under new cap-and-trade regulations adopted by ARB in October 2011.[12] It does not include non-capped measures, which will have little influence on this MTP.

Table 7.7
Expected California GHG Reductions from Scoping Plan ($MMtCO_2e$)

Measures in Capped Sectors	
Transportation	
T-1 Advanced Clean Cars	3.8
T-2 Low Carbon Fuel Standards	15.0
T-3 Regional Targets (SB 375)	3.0
T-4 Tire Pressure Program	0.2
T-5 Ship Electrification	0.6
T-7 Heavy Duty Aerodynamics	0.9
T-8 Medium/Heavy Hybridization	0.0
T-9 High Speed Rail	1.0
Total Transportation	**49.0**
Electricity and Natural Gas	
E-1 Energy Efficiency and Conservation	7.8
CR-1 Energy Efficiency and Conservation	4.1
CR-2 Solar Hot Water	0.1
E-3 Renewable Energy Standards	11.4
E-4 Million Solar Roofs	1.1
Total Electricity and Natural Gas	**24.6**

Source: ARB AB 32 Scoping Plan

[10] Moving Cooler: An Analysis of Transportation Strategies for Reducing Greenhouse Gas Emissions, Cambridge Systematics, Inc 2009.

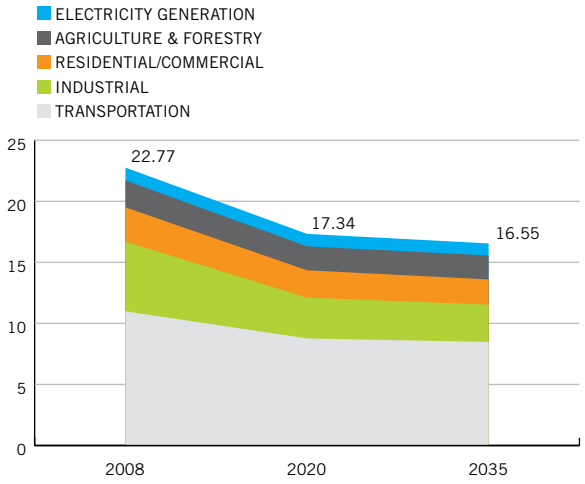
[11] AB 32 Scoping Plan. California Air Resources Board. http://arb.ca.gov/cc/scopingplan/scopingplan.htm

[12] Cap and trade is a strategy used to reduce GHG emissions. The policy sets an annual limit on the amount of GHG emissions that can be released from each source statewide. It then sets a price point at which the various GHG emitters can purchase a permit that allows them to emit a set amount; these permits are often called allowances. A market is then created for these entities to buy and sell allowances, based on their ability and desire to meet the amount set for each allowance. Periodically the cap, allowance amount, and price point are adjusted to facilitate increased GHG reductions. Compliance with ARB regulations begins in 2013.

As part of this MTP/SCS, SACOG conducted an analysis of regional climate change impacts and estimated what emissions were in 1990 and 2008, and to see how well the plan addressed the AB 32 GHG emission reduction goal of returning to 1990 levels by 2020. The MTP/SCS only impacts GHG emissions from sources where SACOG has some influence, mainly from the on-road portion of the regional transportation network and land use decisions, for example where people live and work. However, in order to better illustrate the full picture of GHG emissions in the region, the analysis SACOG conducted considered emissions from different sources, including: the generation of electricity, farming and forestry practices, residential and commercial uses, industrial processing, and all sources of transportation. As expressed in the Scoping Plan, 1990 levels can be approximated as 15 percent below 2008 levels. This is the assumption SACOG made for the MTP analysis, which used local land use data along with data from various state agencies and utility providers to generate an emissions inventory for the region. The analysis concluded that the region emitted 22.7 MMtCO2e in 2008. Therefore, 19.36 MMtCO2e is the level that must be attained by 2020 for the region to meet the reduction target set by AB 32. By implementing the transportation and land use components of the MTP/SCS, and including measures from the Scoping Plan, 2020 emissions are forecasted to be 17.34 MMtCO2e for the region in 2020. This is 12 percent below the target set by AB 32.

AB 32 only set targets for 2020, but the MTP/SCS looks at forecasted growth to the year 2035. Therefore, SACOG decided to take this analysis a little further and estimate GHG emissions for the year 2035. The benefits of the type of growth assumed in the SCS coupled with the efficient transportation system created in the MTP/SCS, further reduce GHG emissions beyond the year 2020. The forecasted emissions for the region are 16.55 $MMtCO_2e$ in the year 2035, an additional 5 percent reduction from 2020 levels. As previously mentioned, despite the fact that SACOG only has influence on land use and transportation sources of GHG emissions, all sectors were evaluated. As illustrated in Figure 7.6, which shows GHG emissions from all sectors for the years 2008, 2020, and 2035, the region's emissions of harmful GHGs are on a downward trajectory. The slope of this trajectory, however, is not as aggressive as it is from 2008 to 2020 as it does not include additional GHG reduction measures similar to those found in the Scoping Plan. Aside from SB 375 GHG reductions, the Scoping Plan has no reductions beyond 2020. All reductions shown beyond 2020 are from the beneficial land use and transportation projects in the MTP/SCS.

Figure 7.6
Plan Area $MMtCO_2e$ Emission by Sector in 2008, 2020, and 2035



Source: SACOG, 2011.

The development and related transportation projects in this MTP/SCS provide for a mix of housing options located closer to jobs and transit. The proposed growth is more compact in form and more effectively utilizes energy and existing infrastructure. This efficient land use and transportation relationship is characterized in Figure 7.6 above, shown by reductions in GHGs from all sectors, but most specifically from Electricity Generation, Residential/Commercial, and Transportation.

SB 375

One of the measures for reducing GHG emissions in the Scoping Plan is SB 375, which required ARB to set regional GHG reduction targets for light-duty trucks and automobiles. The law then requires each of California's MPOs create an integrated land use, housing, and transportation plan that demonstrates how the targets can be met. This plan, the Sustainable Communities Strategy, or SCS, is required to be incorporated into the MTP/SCS. ARB reviews the SCS to determine if it meets the targets, or if an Alternative Planning Strategy (APS) needs to be prepared in order to meet the targets. SB 375 provides incentives to residential mixed-use or residential development, if it is consistent with the SCS, in the form of relief from certain environmental review, described in Chapter 3—Land Use Forecast.

SB 375 Results in the MTP/SCS

ARB set SB 375 GHG emission reduction targets for each of the state's 18 MPOs. For the region, the targets set are 7 percent below 2005 per capita emissions levels by 2020 and 16 percent below 2005 per capita emissions levels by 2035. The benefits of a cohesive land use-transportation relationship, as discussed above, are highlighted in the reduction in GHG emissions from light-duty trucks and

automobiles achieved in the MTP. The smart growth land use pattern and supporting transportation projects in the MTP/SCS are conducive to reducing GHG emissions as required by SB 375 and lead to GHG reductions beyond those targets set by the ARB.

The results in Table 7.8 reflect the more efficient travel from the type of growth forecasted in the MTP/SCS. The table shows the 2005, 2020, and 2035 GHG emissions from light-duty trucks and automobiles.

The per capita GHG pounds per day emissions for the region were 23.0 in 2005, which sets the benchmark for SB 375 reduction. Based on the development in the MTP/SCS, GHG per capita emissions reduce to 20.8 pounds per day in 2020. This is a 9.6 percent reduction from 2005 to 2020, well below the 7 percent reduction set by ARB. The results for 2035 are just as impressive, with per capita GHG pounds per day dropping by 16 percent to 19.7 in 2035. This reduction is for light-duty trucks and automobiles only. GHG emissions from medium and heavy-duty trucks, rail, ship, airplanes, and other transportation sources are not included in this reduction, but are included in the overall GHG emissions previously discussed.

How well the MTP/SCS performs at reducing GHG emissions from transportation becomes more apparent when visualized throughout the region. The map in Figure 7.7 shows GHG emissions per capita from on-road sources in 2035. The average emissions for the region are 19.7 pounds per day for each person. Emission values above that norm are colored in darkening shades of red, and values below are shaded green.

Table 7.8
MTP/SCS Plan Area CO2 Equivalent Emission Estimates for 2005, 2020 and 2035

	CO_2e per Capita (lbs. per day)	Modeled CO_2 Reductions	Off-Model Reductions[1]	Total Reductions from 2005
2005	23.0	n/a	n/a	n/a
2020	20.8	-9%	-1%	-10%
2035	19.7	-14%	-2%	-16%

[1] Off model reductions account for effects of TSM, ITS, and TDM projects not accounted for in SACSIM

Source: SACOG, 2011

Figure 7.7

Greenhouse Gas Emissions per Capita from On-Road Sources

SACOG 2011

Live Oak
Yuba County
Yuba City
Marysville
Sutter County
Wheatland
Colfax
Placer County
Auburn
Lincoln
Rocklin
Loomis
Roseville
El Dorado County
Placerville
Yolo County
Woodland
Citrus Heights
Folsom
Davis
Sacramento
West Sacramento
Rancho Cordova
Winters
Sacramento County
Elk Grove
Galt
Isleton

MILES
0 5 10 15 20
0 5 10 15 20
KILOMETERS

Travel Behavior Approach

Shifting more trips away from automobiles to transit, walking, and biking will reduce energy consumption from transportation. Viable, cost-effective alternatives to driving alone must be provided, and show they are safe, easy and efficient, and reduce the distances people must travel. For this MTP/SCS, SACOG considered several causes and effects of shifts in travel behavior.

There are several factors that influence travel behavior, a key one being cost. Beginning in 2005 and continuing through today, the nation is experiencing unprecedented volatility in fuel prices. Recent projections of fuel prices by the federal Department of Energy[13] and the California Energy Commission[14] have shown a much higher high-end price as compared to past projections. SACOG has worked with other MPO's around the state to develop consistent future projections of fuel prices for use in the integrated plans implementing SB 375 and achieving GHG reduction targets. Fuel prices were assumed to increase to $4.74 by 2020, and to $5.74 by 2035 (both stated in 2009 dollars).

Another key factor that influences transportation activity and the choices people make related to travel is land use. The relationship between land use and travel behavior is often referred to as the "D's", for variables including: Destination, Design, Diversity, Distance, and Density. Destination is a measure of how accessible by transit and driving an area is to the rest of the region. The less time spent getting from an area to a concentration of jobs, the more accessible the area. The Design variable describes the street pattern of an area, which makes travel by any mode more or less efficient. The mix of land uses within an area, or Diversity, will provide for fewer and shorter trips. Distance to nearest transit measures how likely trips coming to and leaving an area will be made by transit. Lastly Density, and specifically residential density, has been shown to be a key indicator of the likelihood of non-auto forms of travel. SACOG considered all of these factors when developing the land use pattern and transportation projects in the MTP/SCS. See Chapter 5A for a more detailed discussion on the relationship between land use and transportation, and the performance of the MTP/SCS as it relates to these variables.

The short-term effects from changing the cost of travel involves shifting from automobile use, while long-run effects are greater and include relocating homes or work locations in order to shorten travel distances. Travel options range from taking fewer auto trips, carpooling, and buying more fuel-efficient vehicles, to using transit, walking, biking, or some other mode of transportation. In this MTP/SCS, total person trips by walk, bike and transit increase by 755,500 for weekday travel, which is an 85 percent increase from the 2008 base year. The MTP/SCS was forecasted to increase per capita trips by bike, walk or transit from 0.40 in 2008 to 0.53, a 33 percent increase by 2035. People can also change the locations of their homes, jobs, or both to reduce their travel miles. People who live in areas with a mix of land uses in close proximity, and with nearby transit, walking and biking facilities will probably experience less inconvenience and disruption to their daily lives than others. While investments in public transportation infrastructure are expensive, a review of cost-benefit studies by Cambridge Systematics found that the benefits out-weigh the costs as much as 3 to 1. Additional benefits outside of reducing GHG emissions can include: "expanded travel options, reduced congestion, greater accessibility, improvements in the livability of urban areas, improved equity, improved environmental quality, enhanced public health, and improved safety"[15].

Travel Efficiency Approach

Another approach to addressing the impact GHG emissions have on climate change is advancing technologies that create more efficient forms of travel and reduce GHG emissions by automobiles. These include increased fuel efficiency, decreased carbon in fuel, and more efficient engine design. Although these are not specifically considered as part of the MTP, mainly because SB 375 does not allow for advances in technology to achieve GHG reduction goals, it is an integral part of the multi-strategy approach to addressing climate change from travel. AB 32 has very specific measures aimed at reducing GHG emissions from travel by making travel more efficient. SACOG has taken every possible step to make sure that the MTP/SCS does not interfere with the implementation and achievement of AB 32 goals.

The technological improvements most effective at dealing with global climate change increase fuel efficiency significantly, reduce carbon in fuels, or capture carbon emissions. Major advances in cleaner and more efficient technology are being made. Increased use of cleaner-burning fuels and engines will help reduce GHG emissions, while improvements to fuel efficiency will result in less consumption of fossil fuels. The uncertainty is when these technologies will penetrate the market, and how widely available and purchased they will be.

As discussed in more detail in Chapter 5A, technical coordination among MPOs statewide resulted in a consensus on the most likely passenger vehicle fleet fuel efficiency (25.5 miles per gallon in 2020, increasing to 29.3 by 2035), fuel prices for 2020 and 2035, and vehicle operating costs to use for the MTP/SCS.

[13] Department of Energy, "Energy Outlook" series provides forecasts and projections of prices for gasoline and diesel.

[14] California Energy Commission "Integrated Energy Policy Reports" series provides forecasts and projections of prices for gasoline and diesel.

[15] Moving Cooler: An Analysis of Transportation Strategies for Reducing Greenhouse Gas Emissions, Cambridge Systematics, Inc 2009.

Chapter 8

Equity and Choice

Provide real, viable travel choices for all people throughout our diverse region

Introduction

SACOG is required by law to conduct an environmental justice analysis as part of the MTP/SCS, to determine whether the MTP/SCS benefits low-income and minority communities equitably, and whether the Plan's transportation investments have any disproportionate negative effects on minority and/or low-income populations in the SACOG region. SACOG has conducted such analyses in the last several MTPs.

While Chapter 5 analyzes the general performance of the MTP/SCS, this chapter provides SACOG's environmental justice analysis. The chapter seeks not only to fulfill SACOG's legal requirement to analyze the environmental justice impacts of the MTP/SCS, including expanded performance measures from previous MTPs, but also to understand and compare the benefits and effects of the MTP/SCS for the region's residents, including those who live in more low-income or minority communities.

The chapter includes the following:

- Legal requirements for environmental justice analysis
- How Environmental Justice (EJ) Areas are defined
- Characteristics of EJ Areas
- Analysis of EJ impacts of the MTP/SCS, including new performance measures
- Strategies for building analytical capacity and expertise

Legal Framework

Planning Process and Environmental Justice

Title VI of the Civil Rights Act, first adopted in 1964, set the initial legal framework for environmental justice analysis, stating that "No person . . . shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance." Title VI was later amended to include gender, religion, and disability. In 1987, it was further amended to extend non-discrimination requirements for recipients of federal aid to all of their programs and activities, not just those funded with federal funds.

California Government Code Section 11135(a) also addresses discrimination by recipients of state funds:

> *No person in the State of California shall, on the basis of race, national origin, ethnic group identification, religion, age, sex, sexual orientation, color, or disability, be unlawfully denied full and equal access to the benefits of, or be unlawfully subjected to discrimination under, any program or activity that is conducted, operated, or administered by the state or by any state agency, is funded directly by the state, or receives any financial assistance from the state.*

To implement and ensure compliance with these statutes, federal and state agencies have issued a series of orders, regulations and guidance on environmental justice. In 1994, President Clinton issued Executive Order 12898 on "Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations."[1] In 1997, the Department of Transportation followed up with an Order on Environmental Justice[2] designed to implement the Executive Order.

In December 1998, the Federal Highway Administration (FHWA) issued its own environmental justice order. As a federally designated metropolitan transportation planning organization (MPO), SACOG is required to comply with the rules and policies set forth by FHWA. FHWA outlines three main principles underlying environmental justice:

- To avoid, minimize, or mitigate disproportionately high and adverse human health or environmental effects, including social and economic effects, on minority and low-income populations.
- Ensure full and fair participation by all potentially affected communities in the transportation decision making process.

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[1] http://www.archives.gov/federal-register/executive-orders/pdf/12898.pdf

[2] http://www.fhwa.dot.gov/environment/environmental_justice/facts/dot_ord.cfm

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- Prevent denial of, reduction in, or significant delay in the receipt of benefits by minority populations and low-income groups.

Per FHWA's guidance on environmental justice:

> *MPOs serve as the primary forum where State DOTs, transit providers, local agencies, and the public develop local transportation plans and programs that address a metropolitan area's needs. MPOs can help local public officials understand how Title VI and environmental justice requirements improve planning and decision making. To certify compliance with Title VI and address environmental justice, MPOs need to:*
>
> - *Enhance their analytical capabilities to ensure that the long-range transportation plan and the transportation improvement program (TIP) comply with Title VI.*
> - *Identify residential, employment, and transportation patterns of low-income and minority populations so that their needs can be identified and addressed, and the benefits and burdens of transportation investments can be fairly distributed.*
> - *Evaluate and—where necessary—improve their public involvement processes to eliminate participation barriers and engage minority and low-income populations in transportation decision making.*

Engagement & Education for the MTP/SCS

Public Involvement Process for Low-Income and Minority Communities in the MTP/SCS

SACOG's adopted guide for public involvement, the Public Participation Plan (PPP), identifies opportunities for public input at the front end of the MTP/SCS planning process and also prior to final hearings. The process provides complete information on transportation plans, timely public notice, full public access to key decisions, and opportunities for early and continuing involvement in the process for all segments of the region's population, including low-income and minority communities.

In February through April of 2011, staff conducted a PPP amendment including a working group meeting of representatives of environmental justice communities. This meeting specifically asked for input on additional techniques and strategies that could be used to augment the required outreach activities to better meet the needs of our environmental justice populations. Additionally, this group was asked to engage from this first step in framing the public participation process through the entire MTP/SCS process as a partner in outreach and education. The full PPP is located in Appendix G-2.

As part of the development process for the MTP/SCS, SACOG worked to bring in more members of environmental justice communities as defined by statute, and to reach out to other underrepresented populations including persons with disabilities, youth, seniors, recent immigrants and limited English speakers. The goal of this outreach strategy was to obtain feedback from all segments of the population and to ensure broad participation representative of the region's demographic profile at the public workshops.

Critical to SACOG's overall effort to reduce vehicle miles traveled (VMT) and greenhouse gas emissions is understanding the travel choices residents of the region will want and need to make in the future. As such, public input from all segments of the population was critical to development of this MTP/SCS. Beyond meeting the federal requirement for addressing unique needs of low-income and minority communities, SACOG is sensitive to ensuring that transportation investments set forth in this MTP/SCS help support diverse transportation choices that reflect and meet the travel needs of the region's residents.

To meet the goal of better engaging with environmental justice communities and underrepresented residents, SACOG not only used the legally required techniques described in Chapter 2, but also sought out underrepresented residents not included in the environmental justice statute.

Key efforts included:

- Presentations to over 130 community groups during the 2010 and 2011 planning process.
- Focus groups with a number of representatives from equity, public health, affordable housing, and human service groups, and minority, low-income, senior, youth, disabled and recent immigrant populations, identified in Appendix G-3.
- Translation of MTP/SCS workshop fliers into Spanish for all locations (Spanish is the most common non-English language spoken in the region).
- Advance preparation work with translators and translation of workshop materials into Russian and Vietnamese.
- On-site translators for participants needing translation into Russian, Asian languages, and Spanish.
- Financial assistance to low-income residents who would be burdened by the cost of transportation, plus free dial-a-ride service by Paratransit, Inc. provided by request for all workshops, including areas not in the Paratransit service area.
- Findings from eight focus groups with residents from environmental justice populations in the region, including Asian-Pacific Islander, African-American, Hispanic/Latino, Native American/American Indian, and low-income populations, conducted with support from Caltrans and the consulting firm MIG. (For a focus group summary, see Appendix G-3.)
- Consideration of findings and recommendations from a SACOG study completed in February 2011 assessing the needs of transit-dependent residents in the region to reach essential or "lifeline" destinations.[3]

For more information related specifically to the MTP/SCS 2010 workshops, see Chapter 2, The Planning Process.

Environmental Justice Area Definitions

FHWA requires MPOs' environmental justice analyses to address persons belonging to any of the following groups:

- Black—a person having origins in any of the black racial groups of Africa.
- Hispanic—a person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race.
- Asian—a person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent.
- American Indian and Alaskan Native—a person having origins in any of the original people of North America and who maintains cultural identification through tribal affiliation or community recognition.
- Low-Income—a person whose household income (or in the case of a community or group, whose median household income) is at or below the U.S. Department of Health and Human Services poverty guidelines.

The Council on Environmental Quality's guidance for environmental justice analysis under the National Environmental Policy Act (NEPA) also provides the following definitions for minority individuals and minority populations:

> *Minority individuals are defined as members of the following population groups: American Indian or Alaskan Native; Asian or Pacific Islander; Black; or Hispanic.*
>
> *Minority populations should be identified where either: (a) the minority population of the affected area exceeds 50 percent or (b) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis.*

However, Caltrans' Desk Guide on Environmental Justice in Transportation Planning and Investments—developed for public agencies, elected officials, community-based organizations, and concerned citizens—cautions that, "while these are the official definitions for NEPA analyses, they may not be appropriate for assessing environmental justice issues in transportation plans, particularly in a state like California where minority individuals are the majority of residents."[4]

In January 2011, SACOG received a grant from the U.S. Department of Housing and Urban Development for regional planning to complete a Regional Plan for Sustainable Development and accelerate transit-oriented development (TOD) to support implementation of the Blueprint Vision and MTP/SCS. As part of this grant work, SACOG has had the opportunity to work with faculty and students of the UC

[3] SACOG, Outreach and Analysis of Transit Dependent Needs, February 2011, www.sacog.org/transit/lifelinetransitstudy.cfm

[4] California Department of Transportation, Environmental Desk Guide, January 2003, www.dot.ca.gov/hq/tpp/offices/ocp/ej_titlevi_files/EnvironmentalJusticeDeskGuideJan2003.pdf

Davis Center for Regional Change (CRC) on enhanced equity indicators and performance measures to inform the MTP/SCS environmental justice analysis and Transit Priority Area work.

CRC's focus included assistance on defining Environmental Justice Areas for the MTP/SCS analysis to reflect both changes in Census data availability between 2000 and 2010 and changes in the six-county region. Several factors were of particular significance:

The previous 2008 MTP used 2000 Census data. This MTP/SCS uses 2010 Census data, or where that information is not available, data from the 2005-2009 American Community Survey (ACS). This reflects the major shift in how the Census is and will be produced in the future—away from the more detailed decennial surveying of a larger population to more frequent, less-detailed surveying of smaller populations in the ACS. While this shift over time will have the positive effect of providing Census information more often than every 10 years, it unfortunately has also removed some categories of long-form information that were available in the 2000 Census—such as more detailed household income data—and created more significant issues with margins of error that result from a small number of Census surveys being used to estimate income across a large urban and rural region. As a result the definition of areas with low income can only be determined at the Census "tract" level versus the smaller "block group" level that is used for the other definitions of Environmental Justice areas included in this chapter.

Population data from the 2010 Census shows that the Sacramento region has significantly increased in diversity since the prior Census. Between 2000 and 2010, the Black/African-American population in the region grew by 21 percent, the population of two or more races grew by 29 percent, Hispanic and Asian populations both grew by 56 percent, and the Native Hawaiian/Other Pacific Islander population grew by 93 percent, compared with 5 percent total growth in the Caucasian/White population. As shown in Table 8.1, the "minority" population has grown to half or more of the population in Sacramento, Sutter and Yolo counties, and 44 percent of the region's population.

Table 8.1
Minority Population in the SACOG Region, 2000–2010

County	2000	2010
El Dorado	15%	20%
Placer	17%	24%
Sacramento	42%	52%
Sutter	40%	50%
Yolo	42%	50%
Yuba	35%	41%
Region	36%	44%

Source: SACOG, September 2011.

This led to a reexamination of how to define "minority" communities. (A complete description of how the definition was developed is included in Appendix C-5.)

CRC's HUD grant work included evaluation of the TOD areas to be studied in the Regional Plan for Sustainable Development. CRC developed two neighborhood indices, a vulnerability index and an opportunity index, that could be used to compare the demographic and socio-economic characteristics of specific neighborhoods to the region as a whole.

Informed by CRC and the grant project's Equity, Housing and Public Health Working Group, SACOG developed the following criteria to define low-income and minority communities for this environmental justice analysis:

- Low-Income Communities: Census Tracts where 45 percent or more of the population earns 200 percent or less of the federal poverty level, based on 2005–2009 ACS data. Tracts meeting this threshold include about 19 percent of the region's population.
- Minority Communities: Census Block Groups where 70 percent or more of the population is Asian Pacific Islander, African American, Hispanic, Native American or other Non-White ethnic group, based on 2010 Census data. Block groups meeting this threshold include about 19 percent of the region's population.

Communities meeting one or both criteria are considered environmental justice areas (EJ Areas) for purposes of this analysis. In addition, SACOG added the following new criteria for defining EJ Areas, drawn from the CRC vulnerability index:

- Vulnerable Communities: Block groups in the region that, according to U.S. Census information, when compared with the regional average, are in the top quintile on at least four of these five vulnerability measures:
  - Housing cost burden: percent of renter- and owner-occupied housing units paying more than 50 percent of household income in housing costs.
  - Single parent households: percent of family households with their own children under age 18 with a single householder.
  - Older population: percentage of population aged 75 and older.
  - Educational attainment: percentage of population 25 years and older with less than a high school degree.
  - Linguistic isolation: percent of households where English is not the primary language and is not spoken very well.

This third criterion added to the EJ Areas three block groups totaling about 4,400 people in Sutter County and one block group in Sacramento County with a population of about 2,800. Combined, the total population of the resulting EJ Areas is about 26.5 percent of the total regional population.

A more in-depth technical review of the changes in Census data and EJ Area definition methodology is contained in Appendix C-5.

Before describing EJ Area characteristics, it is also important to note that:

- Whether areas qualify as "EJ" or "Non-EJ" depends on thresholds for block groups or census tracts that quantify the residents of an area, but they are not monolithic. There are residents who do not have low incomes and/or who are not from minority groups who reside in EJ Areas. There are also low-income and minority residents who live in Non-EJ Areas.
- With its current analytical tools, SACOG is not able to forecast the location of future low-income and minority populations or EJ Areas. As a result, the areas that qualify as EJ Areas in the 2008 base year are assumed to be the same for the 2035 analysis. SACOG analyzes performance measures for all residents of both EJ and Non-EJ Areas in 2008 and 2035, but cannot meaningfully say whether those residents will continue to have the same minority, income and/or vulnerability characteristics in 2035 as in 2008. Although SACOG currently does not have the forecasting capacity to make more accurate predictions, the populations living in what are now EJ or Non-EJ Areas will likely be different in 2035. The Center for Continuing Study of the California Economy (CCSCE) projects that the Sacramento region will continue to become more diverse, with the largest population growth coming from Hispanic and Asian residents over the coming decades. This continued diversification, combined with the MTP/SCS commitment to provide a full range of housing choices in sub-areas throughout the region—reinforced by state Regional Housing Needs Allocation requirements—means that some of the MTP/SCS analysis for later years may understate benefits or overstate impacts on future minority and/or low-income populations.
- Senior and disabled populations are not included in the FHWA low-income and minority definitions, and were consequently not specifically included in the demographic analysis in this chapter. However, the transportation needs and opportunities to improve transportation services for these groups were also considered in developing the MTP recommendations.
- Youth are also not specifically included in the FHWA definitions, but have their own transportation needs. The Healthy Youth/Healthy Regions study for the area, commissioned by Sierra Health Foundation with additional funding provided by The California Endowment and conducted by the UC Davis Center for Regional Change found that, "Vulnerable youth often perceive the physical infrastructure of the Capital Region as an obstacle to their well-being. Young people bemoan the lack of sidewalks or bike lanes on routes they must travel to study, work and shop, inadequate and expensive public transportation and the absence of areas designated for teen gathering and recreation."[5] The MTP/SCS considered improvements to meet youth transportation needs as well.

[5] Center for Regional Change, Healthy Youth/Healthy Regions: Informing Action for the 9 County Capital Region and its Youth, July 2011, p. 19

Environmental Justice Area Characteristics

Of the 1,426 block groups in the region, 386 make up the region's EJ Areas. A total of 164 block groups meet low-income criteria alone and 112 meet both low-income and minority criteria, totaling 67 percent of the EJ Area population. Another 106 block groups meet minority community criteria alone, with 32 percent of the EJ Area population. Four block groups meet vulnerability criteria alone, with 1 percent of the population. Figure 8.1 illustrates where block groups meet only a single threshold compared with block groups that meet both low-income and minority thresholds. The following is a general description of the EJ Areas across the region:

In Elk Grove, the EJ area consists of four block groups on the western edge of Laguna West along I-5, 14 in the Cresleigh Ranch/Gilliam Meadows area of southern Elk Grove, three in northern Elk Grove between Calvine Road and Sheldon Road east of Hwy 99, and four between Big Horn Blvd. and the city's northern border with Sacramento.

In Galt, the EJ area consists of three block groups between McFarland St & State Route 99, from A St to Twin Cities Rd.

The EJ Area in Rancho Cordova consists of 10 block groups in and around Lincoln Village, Cordova Meadows, and Mills Park.

In the city of Sacramento, EJ areas consist of 173 total block groups. Of these, 44 block groups cover the Parkcrest Estates, Valley Hi, Parkway, and Cosumnes River College areas, four block groups are in the Pocket, ten are around and include Executive Airport, 21 are in North and South City Farms, Oak Park, Tallac Village, and the UCD Medical Center areas, five in Colonial Village, 17 in the Fruitridge Manor, Lemon Hill, and Glen Elder areas south of Fruitridge, and four in the Muir Park area. In downtown Sacramento, nine block groups are between R Street & Broadway, and nine more in the SP/Richards area, Midtown, Mansion Flats, and Southside Park areas. Two block groups that make up CSUS are included. In northern Sacramento, 52 block groups are in the South Natomas, Gardenland, Oak Knoll, and Swanston Estates areas between I-80 and the American River, eight in the Glenwood Meadows and Bell Avenue areas north of I-80, and five in North Natomas around Power Balance Pavilion, Creekside Estates and Regency Park. Some of these block groups, particularly those on the city limit boundary, are partially in the unincorporated area or the city of Elk Grove as well as the city of Sacramento.

In unincorporated Sacramento County, the EJ area includes six block groups north of McClellan Air Park, and 14 block groups in the communities of North Highlands and Baywood North. Four block groups are included in the La Riviera area and 38 in the unincorporated areas in south Sacramento County bordering on the City of Sacramento and the City of Elk Grove.

The EJ Areas in Sutter County include the five block groups including and surrounding the city of Live Oak, and 15 block groups in central Yuba City.

In Yolo County, the EJ Area includes eight block groups in northern West Sacramento, one of which extends north along the Sacramento River all the way to Knights Landing (a large geographic area but lightly populated), and four block groups in West Sacramento west of Sycamore Avenue between the Union Pacific rail line and the shipping channel. In Davis, the EJ area consists of 11 block groups in Central Davis and the South Cape area south of I-80, and four block groups in the Sycamore South area east of State Route 113 between West Covell and Russell Boulevards. Woodland's EJ area consists of five block groups surrounding the Main and East Street intersection including Beamer Park, Campbell Park, Donnelly Circle, and the Yolo County Fairgrounds, one block group on California Street south of Main Street, and one block group east of Pioneer Street south of I-5.

In Yuba County, the EJ Area includes the five block groups covering downtown Marysville, 15 block groups covering the unincorporated areas of Olivehurst and Linda, and two block groups covering Beale Air Force Base.

While all of these areas, shown in Figure 8.1, are included for purposes of this analysis, it is interesting to note that there are a number of block groups defined as EJ Areas that are ethnically diverse, but without the low-income or vulnerability characteristics that tend to predict greater needs for public transportation or other services due to income, age, household status, or transit-dependency.

Figure 8.1

Environmental Justice Areas

SACOG 2011

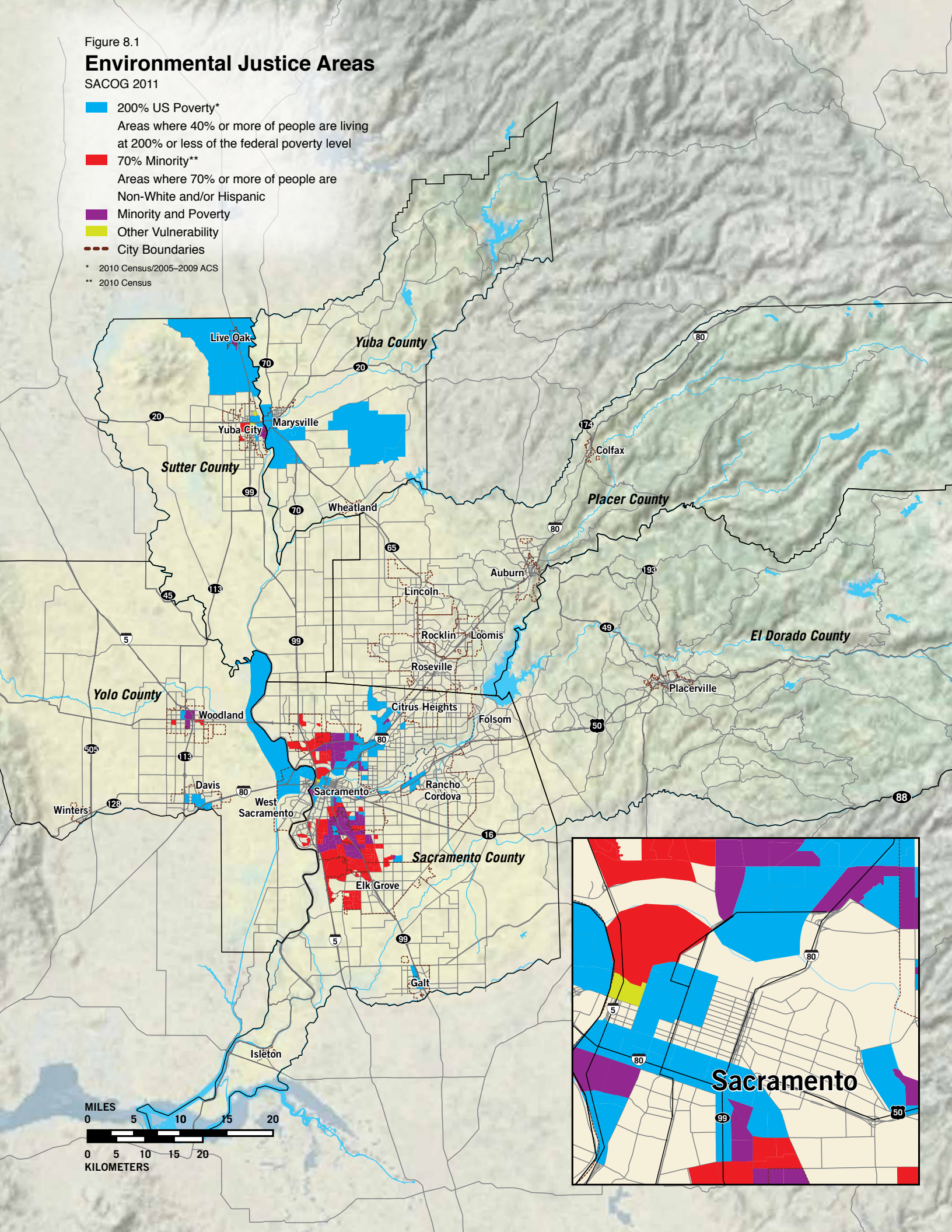


Table 8.2 provides basic demographic information for EJ vs. Non-EJ Areas in the region:

Table 8.2

Demographic Information for EJ vs. Non-EJ Areas

Basic Census Statistics for Environmental Justice Analysis Areas

	Persons per household	Persons living in households earning less than 200% of federal poverty level	White	Black	American Indian/ Alaskan Native	Asian	Native Hawaiian/ Other Pacific Islander	Other Race	Two or More races	Hispanic or Latino
El Dorado County (part)										
EJ Analysis Areas	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Non-EJ Areas	2.7	14.8%	82%	1%	1%	3%	0%	0%	3%	10%
Placer County (part)										
EJ Analysis Areas	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Non-EJ Areas	2.7	16.9%	76%	1%	1%	6%	0%	0%	3%	12%
Sacramento County										
EJ Analysis Areas	2.9	55.9%	27%	16%	1%	20%	2%	0%	5%	30%
Non-EJ Areas	2.6	24.6%	61%	7%	1%	11%	1%	0%	4%	17%
Sutter County										
EJ Analysis Areas	3.0	55.3%	39%	2%	1%	13%	0%	0%	3%	41%
Non-EJ Areas	2.9	27.4%	57%	2%	1%	15%	0%	0%	3%	21%
Yolo County										
EJ Analysis Areas	2.6	55.1%	43%	3%	1%	15%	0%	0%	3%	35%
Non-EJ Areas	2.6	28.1%	53%	2%	1%	12%	0%	0%	3%	28%
Yuba County										
EJ Analysis Areas	3.1	56.5%	49%	3%	2%	8%	0%	0%	4%	32%
Non-EJ Areas	2.8	27.5%	68%	2%	2%	5%	0%	0%	5%	18%
Region										
EJ Analysis Areas	2.9	55.8%	30%	13%	1%	19%	1%	0%	5%	32%
Non-EJ Areas	2.6	22.8%	65%	4%	1%	9%	0%	0%	4%	16%

* Does not include Lake Tahoe portions of either county.

Source: SACOG, September 2011.

Key characteristics of EJ analysis areas include:

- About 26 percent of the region's population lives in the defined EJ Areas. With the change in the 2010 Census data collection between the 2008 MTP and this MTP/SCS, El Dorado County and Placer County no longer have defined EJ Areas because of income data limitations, described more fully in Appendix C-5. As a result, previously observable communities with low-income residents are now only observed within the context of larger geographies that do not meet the thresholds.
- People in the EJ Areas are more than twice as likely to be classified as low income as people in other areas.
- Between 2000 and 2010, population diversity in the Sacramento region increased in both EJ and Non-EJ Areas. Regionally, the proportion of Hispanics living in EJ Areas grew from 24 to 32 percent, and from 10 to 16 percent in Non-EJ Areas. The Asian population increased from 15 to 19 percent in EJ Areas and from 4 to 9 percent in Non-EJ Areas. The African-American or Black population rose from 12 to 13 percent in EJ Areas, and 2 to 4 percent in Non-EJ Areas, while the proportion of people of two or more races grew from 3 to 4 percent in Non-EJ Areas. Minority population growth rates were greater in Non-EJ areas (66.7 percent increase) than in EJ Areas (18.6 percent increase).
- Meanwhile, the white population dropped by 11 percent (41 percent to 30 percent) in EJ Areas, and 14 percent in Non-EJ Areas (79 percent to 65 percent) between 2000 and 2010.
- Between 2000 and 2010, household size increased in EJ Areas in Sacramento and Yuba counties, and in Non-EJ Areas in Placer and Sacramento counties. This may reflect in part the increase in adult children living with parents or doubling-up of families due to the economic downturn, as well as cultural traditions of multi-generational households and higher birthrates among some ethnic groups.
- Households in EJ Areas tend to use transit, walking and bicycling at significantly higher rates than Non-EJ households—more than twice the rate for transit use and a 50 percent greater rate for walking and bicycling region-wide. Table 8.3 shows regional mode shares for both EJ and Non-EJ Areas. This also indicates that, while less than Non-EJ Areas, the large majority of EJ Area residents use personal vehicles for transportation.

Table 8.3
Comparison of Non-Auto Mode Shares Between EJ and Non-EJ Areas

Area Type	Transit	Bicycle & Walk
EJ Areas	2.1%	12%
Non-EJ Areas	1%	8%

Source: SACOG, September 2011.

Analysis of Environmental Justice Area Impacts

Chapters 5A, 5B, and 5C provide an in-depth discussion of the overall MTP/SCS performance and access and mobility improvements over the plan period. This chapter analyzes MTP/SCS performance and impacts specifically on EJ Areas compared with Non-EJ Areas.

The 2008 MTP focused primarily on measuring transit and auto access to jobs, transit access to retail jobs and medical services, and population living close to 15-minute transit lines for EJ and Non-EJ Areas. SACOG also worked with the UC Davis Center for Regional Change (CRC) to review and develop the performance measures used in this analysis. As a result of this work, the performance measures used in this MTP/SCS analysis have been expanded to include measures of housing mix, transit access to higher education and parks, auto accessibility and shifts in mode share, and proximity to high-volume roadways that may be a source of toxic air contaminants. The following sections detail these performance measures.

Location and Housing Choice

Community Types

Chapter 3 discusses in more detail the Community Types developed as part of the land use framework for the MTP/SCS. Center and Corridor Communities and Established Communities are allocated significant growth in both housing and employment in the MTP/SCS, with these infill areas also supported by a greater mix of uses and transportation options.

In 2008, one-fifth of the population of EJ Areas lived in Centers and Corridors and over three-quarters in Established Communities. By 2035, over 175,000 more people in EJ Areas and 295,000 people in Non-EJ Areas will live in these Community Types, where land uses and housing and employment densities are planned to better support transit services and other mode choices for access to home, work, daily needs and services. By the end of the plan period, nearly 30 percent of the EJ Area population and 9 percent of the Non-EJ Area population will be in Centers and Corridors and 66 percent of EJ Area population and 65 percent of Non-EJ Area population will be in Established Communities. Table 8.4 shows these shifts between 2008 and 2035. The other major increase of Non-EJ Area population will be in Developing Communities.

Table 8.4

EJ and Non-EJ Area Population in Community Types, 2008 and 2035

Community Type	Percent of EJ Area population in 2008	Percent of EJ Area population in 2035	Percent of Non-EJ Area population in 2008	Percent of Non-EJ Area population in 2035
Center/Corridor	20.3%	28.8%	6.5%	9%
Established	77.3%	66.1%	79.3%	65.2%
Developing	2%	4.7%	3.9%	17.7%
Rural Residential	0.5%	0.4%	10.3%	8.1%

Source: SACOG, September 2011.

Population in Transit Priority Areas

MTP transit investments are especially focused on supporting high-quality transit in Transit Priority Areas slated for greater housing and employment growth, as described in more detail in Chapters 3 and 4. The MTP/SCS identifies Transit Priority Areas (TPAs) within a half-mile of quality transit service in Placer, Sacramento and Yolo counties. El Dorado and Placer counties did not meet thresholds for EJ Areas so there is no overlap between EJ Areas and TPA population in those counties. However, as shown in Table 8.5, a quarter of Sacramento County's EJ Area residents and 41 percent of Yolo County's EJ Area residents lived in TPAs in 2008.

By 2035, EJ Area population in Sacramento and Yolo counties is expected to grow by 36 percent overall, but with a 193 percent increase in the population and 191 percent increase in the jobs within TPAs. This provides over 400,000 minority, low-income, or other residents of EJ Areas with greater opportunities to live and/or work near quality transit.

The population and employment growth in TPAs is also proportionate in the benefits for Non-EJ Areas, where population overall is expected to grow by 40 percent, with a 216 percent increase in the population and 199 percent increase in the jobs in TPAs. This should provide new opportunities for residents who live in Non-EJ Areas to live and/or work near transit as well, including minority or low-income individuals.

Table 8.5
Comparison of EJ and Non-EJ Areas with Transit Priority Areas, 2008 and 2035

County	Population EJ Area % In TPA	Population Non-EJ Area % In TPA	Jobs EJ Area % In TPA	Jobs Non-EJ Area % In TPA
2008				
El Dorado	0%	0%	0%	0%
Placer	0%	2%	0%	4.3%
Sacramento	25%	12.9%	55.6%	26.5%
Sutter	0%	0%	0%	0%
Yolo	40.7%	33.1%	20.7%	32.3%
Yuba	0%	0%	0%	0%
Region	23.5%	10.4%	44.2%	19.7%
2035				
El Dorado	0%	0%	0%	0%
Placer	0%	7%	0%	25.4%
Sacramento	56%	31.6%	78.3%	55.3%
Sutter	0%	0%	0%	0%
Yolo	67.4%	51.8%	49.2%	47.8%
Yuba	0%	0%	0%	0%
Region	**50.8%**	**23.4%**	**65.2%**	**42.3%**

Source: SACOG, September 2011.

Demographic Shifts

As noted earlier, SACOG does not forecast future locations of low-income and minority populations, so our analysis is limited to what is expected to happen concerning the population growth in identified geographic locations in the region, but not the demographic make-up of the population in these locations. However, it is likely that there will be a greater demographic and income mix in the various Community Types and TPAs over the planning period.

Dowell Myers, Director of the Population Dynamics Research Group in the University of Southern California's School of Policy, Planning and Development, notes that in California, "An earlier generation—predominantly white and now aging—is being replaced by a new generation comprising immigrants and their children, who are a mix of U.S.-born young of all ethnicities."[6] Myers's research has found upward mobility in terms of education, English proficiency, income, and homeownership among long-term first generation Latino and other immigrants, their second-generation children and third-generation grandchildren[7], which will likely impact the demographic mix in current EJ and non-EJ Areas and Community Types over the planning period.

Myers' analysis of Census data also found that in California a significant sell-off of homes took place in the 2000s, beginning with those who were 55-64 in 2000, and increasing to 67 percent of homeowners who were 75+ in 2000. Myers notes that, "The front half of the Baby Boomers are now positioned at ages 55–64 and about to begin this decline, and their initial numbers are 45.0% larger than the cohort occupying that age group in 2000. If the same attrition rates are applied in the coming decade, the sell-off of homeowners will be 45% greater."[8] Myers found that replacement homebuyers are largely younger Latino and Asian households rather than white non-Hispanic home

[6] Myers, Dowell, Immigrants and Boomers: Forging a New Social Contract for the Future of America, Russell Sage Foundation, 2007, pp. 4–5

[7] Myers, Dowell, Powerpoint on Immigrants and Boomers: Forging a New Social Contract for the Future of America, http://www.library.ca.gov/lds/docs/tlaf/TLAFMyersppt.pdf, slide 40

[8] Myers, Dowell, Attrition of Homeownership in California in the 2000s: Now Seeking Generational Replacements, USC Population Dynamics Research Group July 2011, p. 2.

purchasers, which reinforces the likelihood of increasing demographic diversification across the region's Community Types.

Additionally, SB 375 requires COGs to "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 of the regional transportation plan taking into account net migration into the region, population growth, household formation and employment [and to] identify areas within the region sufficient to house an eight-year projection of the regional housing need for the region." Additionally, SB 375 requires that a COG's regional housing need allocation (RHNA) to individual cities and counties be consistent with the SCS (provided that the aggregate regional RHNA is maintained and that every jurisdiction receives an allocation of housing need for very low- and low-income households).[9] Changing housing demand plus California's unique law, with its emphasis on housing for all income groups as one of its factors and the new requirement that the SCS and RHNA must be consistent with each other, may also mean more increasing income diversity in what are currently EJ and non-EJ Areas.

Housing Product Mix

As discussed in more detail in Chapter 3, the MTP/SCS land use plan projects significant housing and employment growth in more central areas of the region. Consistent with the Blueprint Vision, this growth provides a greater range of housing and transportation options for both existing and new households.

The MTP/SCS projects over 170,000 new homes and over 255,000 new jobs in Center and Corridor and Established Communities, where EJ Area populations are expected to increase significantly, as well as over 125,000 homes and 56,000 jobs in Developing Communities. The MTP/SCS projects 38 percent of new housing units and 39 percent of new employees will be in Transit Priority Areas, within a half-mile of quality transit service. This means that a significant portion of new homes will be close to employment, and in areas with a mix of uses and transportation mode alternatives. The increased accessibility provided within TPAs is discussed in more detail later in this chapter.

In addition, the MTP/SCS projects an increasing diversity of housing types in the region, providing more choices and a greater range of housing prices. In 2008, 77 percent of the region's housing stock was large-lot single family, with 12 percent small-lot single family homes, and 35 percent attached—such as condominiums, townhomes, apartments, and lofts. The Center for Continuing Study of the California Economy (CCSCE) and DB Consulting prepared a report for SACOG projecting population growth in the Sacramento region for the MTP/SCS plan period.[10] The report identifies several major factors that will likely change the demand for these housing types in the region over the plan period:

- Population growth will be concentrated in two groups to 2020: 1) baby boomers moving from the 35–54 age groups into the 55–64 and 65+ age groups, and 2) growth in the young adult (25–34) age group.
- The majority of the region's population growth will come from Hispanic and Asian residents, continuing the trends since 2000. For cultural reasons, Asian and Hispanic residents tend to form fewer households because, beyond primary family members, these households often include other family members, such as grandparents and/or cousins.
- Household formation rates are also lower for younger age groups, because some younger adults live with parents or housemates.
- There will not be growth in the number of households headed by residents aged 35–54 for the next 10–15 years; after 2025, there will be some growth in children and family age population.
- Most of the household growth will occur in households headed by residents aged 65 and above, since older people tend to live alone after divorce or death of a spouse. Two-thirds of households added in the region to 2035 will be headed by people 65 and over. Dowell Myers' research cited above suggests that many older homeowners will choose to sell their homes to downsize, shift into rental housing or assisted living, or move out of state (presumably to retire or be nearer to family).

Because of these population shifts, CCSCE suggests that demand for housing in the region will be influenced particularly by the choices of older residents to stay in their homes or downsize, and by younger households. CCSCE predicts that demand for smaller homes and rentals will increase for both groups, due to smaller household sizes and affordability to more households.

As shown in Table 8.6, by 2035, the MTP/SCS plans for these demographic shifts by increasing the proportion of small-lot and attached homes to 57 percent of the new housing stock in EJ Areas, and 39 percent of the new housing options in Non-EJ Areas.

[9] http://leginfo.ca.gov/pub/07-08/bill/sen/sb_0351-0400/sb_375_bill_20080930_chaptered.html

[10] Stephen Levy, Director, Center for Continuing Study of the California Economy and Viviane Doche-Boulos, Ph.D., DB Consulting, Regional Employment, Population, and Households Projections in the SACOG Region, 2008–2035, October 2010.

Table 8.6
Housing Product Mix, 2008 and 2035 by EJ and Non-EJ Area

	Rural Residential	Large-Lot Single Family	Small-Lot Single Family	Attached	Small Lot Plus Attached
EJ Areas					
Share of EJ Area homes by type, 2008	0.6%	53.5%	11.4%	34.5%	45.9%
Share of total homes in EJ Areas by type, 2035	0.5%	42.3%	13.3%	43.9%	57.2%
Non-EJ Areas					
Share of Non-EJ Area homes by type, 2008	9.5%	59.1%	8.0%	23.3%	31.3%
Share of total homes in Non-EJ Areas by type, 2035	7.6%	53.3%	13.0%	26.1%	39.1%

Source: SACOG, September 2011.

SACOG cannot project the rental or sales prices of new development in particular communities, but smaller lot and attached housing types generally cost less to own or rent than large-lot homes. Chapter 3 notes that attached homes generally include a higher proportion of rentals than detached homes. The growth in these options is expected to increase housing choices and affordability for lower income, minority and other households throughout the region. Chapter 3 contains more detail on these housing types and their growth in the different Community Types over the plan period.

Transportation and Accessibility

The MTP/SCS complements planned land use changes with improvements in transportation options that increase residents' access to key destinations. This section analyzes a series of transportation performance measures used to assess the plan's benefits for EJ and Non-EJ Area residents, including accessibility from EJ and Non-EJ Areas by both transit and driving to such key destinations as jobs, medical facilities, higher education and parks.

The analysis uses a weighted average for the jobs, higher education enrollments, and park acres that can be accessed by transit or car in the region. These weighted averages make it possible to assess changes in accessibility for the average resident in the region, given that the number of origins and destinations varies over time for each county. Both transit and auto accessibility performance measures use 30 minutes for travel time to allow some comparisons.

Transit Service in the MTP/SCS

The 2008 MTP contained a significant increase in funding for transit service. However, as described in more detail in Chapter 10, Financial Stewardship, transit revenues have dropped since 2008, which required adjustments in this MTP/SCS. Because EJ Area residents tend to be more reliant upon transit service than other segments of the population, scenarios that add transit services have been consistently high priorities in community workshops and focus groups. Despite revenue constraints, the MTP/SCS seeks to optimize the provision of transit services in the region, and invest in transit improvements that serve EJ Areas.

Although the draft MTP/SCS contains a 17 percent reduction (10 percent per capita) in transit expenditures from the 2008 MTP, it still nearly doubles vehicle service hours regionwide compared with the base year. Service hours on buses serving EJ Areas increase by 82 percent; service hours on rail and bus routes that serve EJ Areas increase by 88 percent. Transit investments in the MTP/SCS allow service frequencies to improve on existing and new routes and provide new transit options. Figure 8.2 shows the expanded transit network by 2035.

For shorter trips, the increase in shuttle services can improve access to longer distance bus and rail options. New shuttle services benefit all residents, but the greatest benefit for EJ Area residents comes from improved service targeting local trips to shopping, medical facilities, and other public services.

For longer distance trips, extensions of light rail south to Cosumnes River College and north to Natomas, along with a network of bus rapid transit (BRT)/enhanced bus corridors in the MTP/SCS, benefit EJ as well as non-EJ Areas. BRT services are limited-stop buses that run frequently all day to connect major activity centers. Many higher-density areas become "activity centers" by 2035 that contain a large share of the new jobs, shopping and medical facilities. The MTP connects existing and new activity centers with numerous proposed bus rapid transit corridors. While routes provide regionwide benefits, corridors directly serving EJ Areas include new bus rapid transit routes planned for Florin Road, Stockton Blvd., Watt Ave., El Camino Ave., and Auburn Blvd. that will help improve cross-town travel speeds and connect activity centers to neighborhoods with poor connections today.

Reducing transfers is also important to transit-dependent and choice riders who seek a trip that is comparable to the time it would take to drive. The number of transfers will continue to largely depend on the distance traveled, but with the new land use pattern in 2035 changing to better reflect Blueprint principles, many trips will be shorter because of compact and mixed land uses. For longer transit trips that do require a transfer, the increased frequency of service along many routes results in improved "timed transfers" (shorter waiting times), and ultimately a faster transit trip.

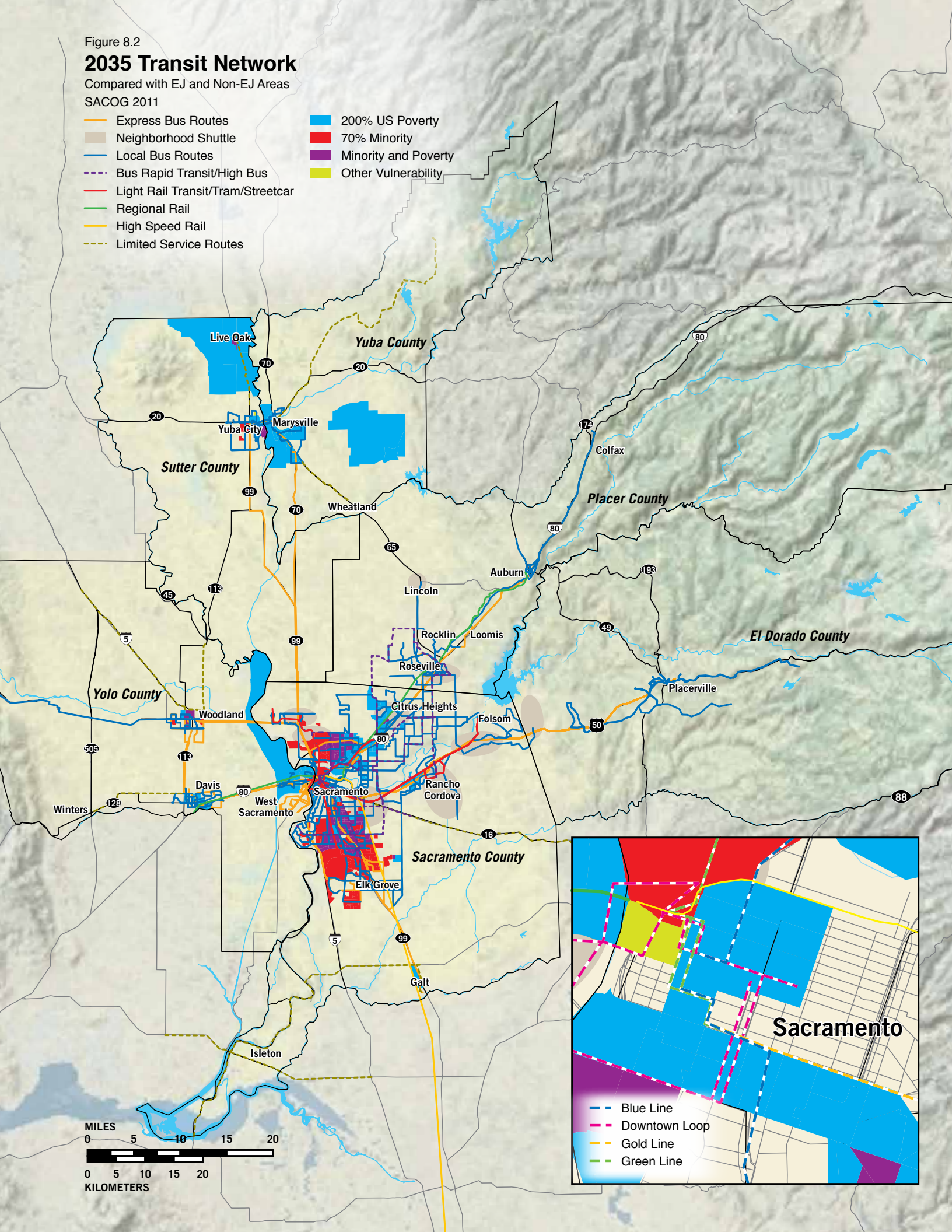
Chapter 4 provides additional detail on transit investments in the plan. Chapter 10 and Appendix B-1 discuss some of the ongoing transit funding challenges facing the region.

Figure 8.2

2035 Transit Network

Compared with EJ and Non-EJ Areas

SACOG 2011



Transit Accessibility

EJ Areas already tend to have higher concentrations of jobs and housing. As detailed in Chapter 3, the MTP/SCS projects significant future housing and employment growth in Centers and Corridor and Established Communities. The combination of this land use pattern with the transit investments in the MTP/SCS is expected to improve transit access to a variety of destinations over the plan period for residents of both EJ and Non-EJ Areas. This section assesses changes in transit access to jobs and medical services, as in the last plan, along with new measures including access to higher education and parks. For the following measures of transit accessibility, transit travel time is calculated from first stop to last stop, including an initial five-minute wait time and time for transfers.

As noted previously, SACOG uses weighted regional averages for 2008 and 2035 for each measure (jobs, higher education, etc.). The two weighted averages are then compared to calculate the percentage increase in accessibility over the plan period. However, these weighted averages should not be read as the total numbers of jobs, enrollments or park acres that residents in the region can access, which vary from county to county. As a weighted average, the numbers instead provide an indication of the average number of jobs or other destinations that the average resident in the region can reach via transit (or auto later in the chapter), rather than total access for individuals living in EJ or Non-EJ Areas in a particular county.

Job Access

Transit access to jobs between 2008 and 2035 improves for both EJ and Non-EJ Areas. Regionwide between 2008 and 2035, as shown in Figure 8.3, jobs accessible within 30 minutes via transit increase by 48 percent from EJ Areas, and 49 percent from Non-EJ Areas, using the weighted average methodology described above.

Access by transit to retail jobs also improves for EJ and Non-EJ Areas. Projections of retail job growth are developed starting with a regional estimate of retail demand provided by the Center for the Continuing Study of the California Economy. That regional demand is then allocated to local land use plans, based on a methodology described in more detail in Appendix E-3. Retail job access is included as a performance measure in this analysis both to measure access to jobs which tend to be entry-level, lower-wage employment opportunities and to measure access to necessary retail services.

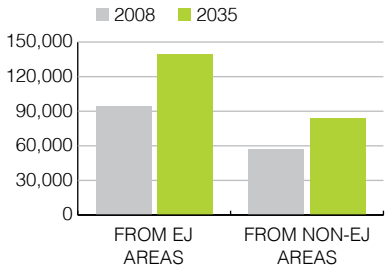
As shown in Figure 8.3, between 2008 and 2035, retail jobs accessible by transit from EJ Areas increase by 47 percent and from Non-EJ Areas by 35 percent.

Figure 8.3

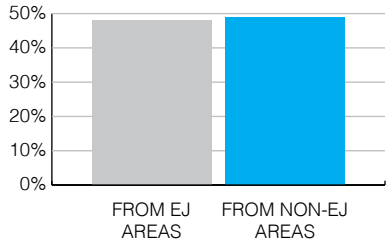
Transit Access to Jobs and Retail Jobs

Increase in Jobs Accessible within 30-Minute Transit Travel Time

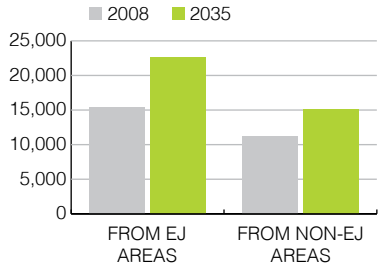
Transit Access to Jobs



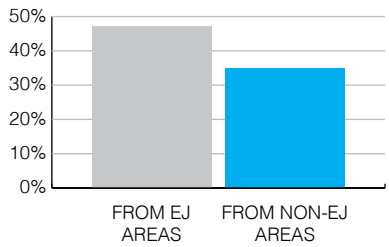
Increase in Jobs Accessible by Transit



Transit Access to Retail Jobs



Increase in Retail Jobs Accessible by Transit



Source: SACOG, September 2011.

Access to Medical Care

Access by transit to medical services as measured by access to medical-related jobs also improves between 2008 and 2035 as illustrated in Figure 8.4.

SACOG defines medically-related services broadly: doctors, dentists, chiropractors, radiologists, mental health professionals, laboratories, imaging centers, etc. These services are provided throughout the region in a multitude of settings, including public and private hospitals and clinics, medical and dental complexes, and individual practitioners' offices. The most effective way that SACOG has found to date to assess transit access to "medical services" is to measure access to "medical jobs" as defined above. The current number and location of these medical jobs is derived from SACOG's parcel-based employment inventory described in Appendix E-3. SACOG then forecasts the growth in medical jobs to 2035. Figure 8.5 shows the location of medical jobs throughout the region in 2008.

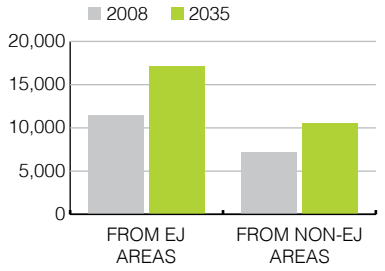
SACOG does recognize limitations with this measure. The measure used in this EJ analysis is of transit access to medical jobs, rather than to medical services. It is currently not possible to measure or forecast each resident's access to their available medical services due to the range of providers available for insured or uninsured medical clients, the fact that residents may or may not have an applicable health or dental insurance plan for a nearby facility, or be able to afford co-pays or direct fees for service.

Figure 8.4

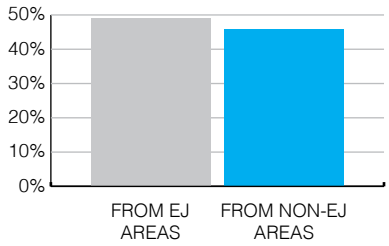
Transit Access to Medical Jobs

Increase in Medical Jobs Accessible within 30-Minute Transit Travel Time

Transit Access to Medical Jobs



Medical Jobs Accessible by Transit



Source: SACOG, September 2011.

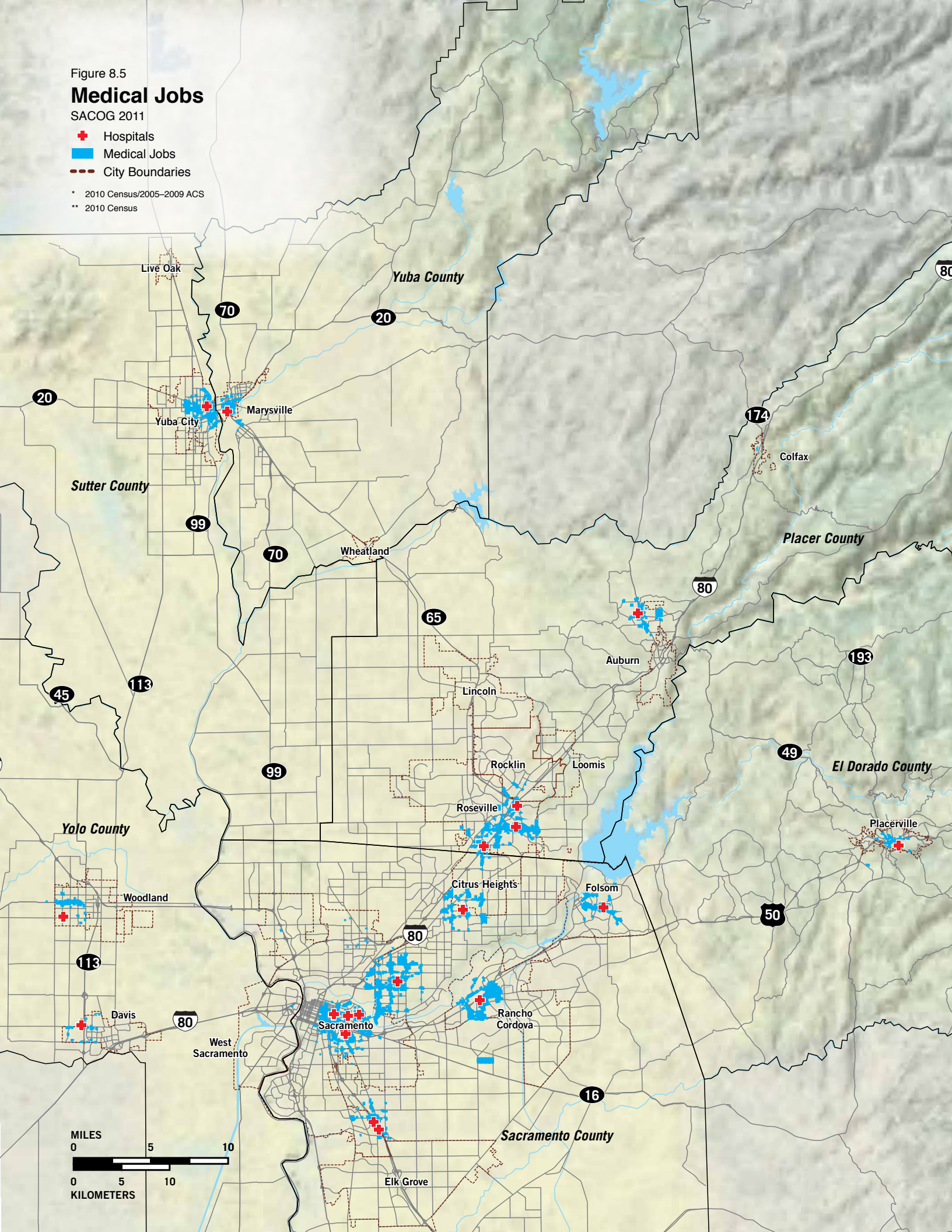


Figure 8.5
Medical Jobs
SACOG 2011
Hospitals
Medical Jobs
City Boundaries
* 2010 Census/2005–2009 ACS
** 2010 Census
Live Oak
Yuba County
Yuba City
Marysville
Sutter County
Wheatland
Colfax
Placer County
Auburn
Lincoln
Rocklin
Loomis
Roseville
El Dorado County
Placerville
Yolo County
Woodland
Citrus Heights
Folsom
Davis
West Sacramento
Sacramento
Rancho Cordova
Sacramento County
Elk Grove
MILES
0 5 10
0 5 10
KILOMETERS

Access to Higher Education

Transit access to higher education is a new performance measure in this MTP/SCS. Higher education is an important stepping stone to careers and employment for many of the region's EJ and Non-EJ Area residents. For this analysis, higher education is defined as public and private universities and colleges, including all of the region's community colleges and satellite campuses (but not adult schools, GED, remediation or vocational training programs that serve targeted populations).

Similar to the previous measure, the most accurate measure in SACOG's current toolbox is transit access to *enrollments* at colleges and universities in the region. This serves as a proxy for all of the institutions of higher education that the average student in an EJ or Non-EJ Area can reach via transit. Enrollments are projected to 2035 based on current enrollments, enrollment growth projected by individual colleges and universities, planned campus sites, and expected population growth.

Access to higher education improves with investments made in the MTP/SCS, as demonstrated in Figure 8.6. Regionwide between 2008 and 2035, the number of enrollments accessible via transit within 30 minutes increases by 69 percent from EJ Areas, as well as 27 percent from Non-EJ Areas. These increases are due both to improved transit service, as well as a 30 percent projected growth over the plan period in higher education capacity in the region, particularly in more central areas.

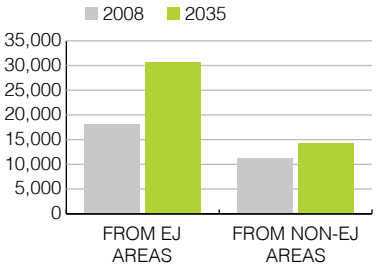
No transit accessibility measure can address which colleges or universities offer the training or degree programs sought by EJ or Non-EJ Area residents or whether student applicants will be accepted for admission, but SACOG recognizes limitations even with its current methodology. Assessing transit access to enrollment levels may understate or overstate transit access from EJ Areas to the variety of higher education institutions in the region. This is another performance measure for which SACOG intends to search for more comprehensive data sources for use in future plan updates.

Figure 8.6

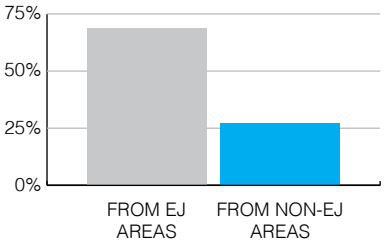
Transit Access to Higher Education

Increase in Higher Education Enrollments Accessible within 30-Minute Transit Travel Time

Transit Access to Higher Education Enrollments



Increase in Higher Education Enrollments Accessible by Transit



Source: SACOG, September 2011.

Access to Parks

Another new measure added by SACOG is transit access to parks. Access to parks is important for youth and adult physical activity, health and recreation opportunities.

Access to parks in this analysis is defined as access to park acres. Future park acreage is projected through 2035 using a standard park ratio of 5 acres per 1,000 population for areas with new growth. As shown in Figure 8.7, by this measure transit park acres accessible within 30 minutes by transit increase by 18 percent from EJ Areas and by 13 percent from Non-EJ Areas. EJ Area residents also have transit access to more park acres than Non-EJ Area residents, likely due to the greater availability of transit services in more central areas.

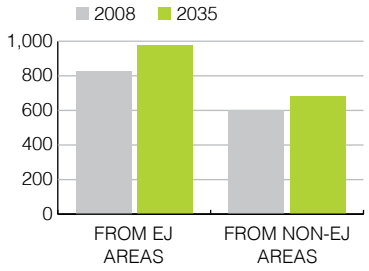
Parks vary from small neighborhood playgrounds to large regional parks, and in park conditions, such as the presence of a community or recreational center in the park, or problems with vandalism or crime that deter use. SACOG's methodology measures access to the number of park acres, rather than the number or types of parks the average person in EJ and Non-EJ Areas can access via transit. SACOG plans to explore new methodologies that can better capture transit access to parks from EJ and Non-EJ Areas, taking into account the significant variation in parks across the region, as well as proximity for walk or bike access.

Figure 8.7

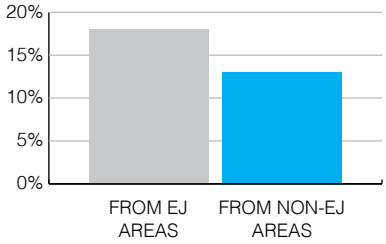
Transit Access to Parks

Increases in Park Acreage Accessible within 30-Minute Transit Travel Time

Transit Access to Park Acres



Increase in Park Acres Accessible by Transit



Source: SACOG, September 2011.

Transit Mode Share

As a result of the land use pattern and transit projects and expenditures in the MTP/SCS, transit use increases as a mode share. Table 8.7 shows transit mode share increases in the region between 2008 and 2035. Although transit use remains limited, in most counties transit mode share more than doubles for both EJ and Non-EJ Areas.

Table 8.7

EJ and Non-EJ Area Transit Mode Share, 2008 & 2035

Area	Percent of All Travel by Transit 2008	Percent of All Travel by Transit 2035
EJ Areas	2.1%	5.7%
Non-EJ Areas	1%	2.4%

Source: SACOG, September 2011.

Roads and Related Improvements

Road projects in the MTP/SCS are located throughout the region and are not disproportionately concentrated in EJ Areas. Figure 8.8 illustrates the key road projects overlaid on EJ and non-EJ Areas. Due to funding shortfalls, the MTP/SCS reduces funds for road capacity investments by 14 percent per capita from the level in the 2008 MTP, while increasing road maintenance/rehabilitation and bicycle/pedestrian funding by 4 and 7 percent per capita, respectively.

The MTP/SCS supports complete streets and investments in bicycle and pedestrian facilities. As discussed in Chapter 4, bike and pedestrian improvements are funded both directly and indirectly in the MTP/SCS. While $2.8 billion is included specifically for bicycle and pedestrian improvements, including bicycle trails, sidewalks, ADA retrofits, and supporting facilities, SACOG estimates that another nearly $600 million will support bicycle and pedestrian facilities as part of maintenance and rehabilitation projects in the region..

Sample MTP/SCS road projects that benefit EJ Areas include:

City of Live Oak: Road rehabilitation and streetscape improvement projects to support redevelopment, including drainage, curb and gutter, sidewalks, bike lanes, and a new Class I bikeway.

City of Rancho Cordova: Safety and aesthetic improvements on Folsom Blvd. between Bradshaw Rd. and Sunrise Blvd., including along the frontage of the planned Los Rios Community College satellite campus, including landscaped medians, sidewalks, streetscape improvements at intersections, street lights, and safety improvements for bicycle and pedestrian access to light rail and bus transit.

City of Sacramento:

- Improvements at Broadway and Martin Luther King, Jr. Blvd., including improved curbs, gutters and sidewalks, higher visibility crosswalks, accessibility ramps, upgraded signals and traffic-calming measures.
- On Del Paso Blvd. between Arden Way and Hwy 160: road diet between Barstow and Acoma streets; streetscape improvements, including pedestrian plaza, sidewalks, bulb-outs, restriped pedestrian crossings, street furniture, landscaping; and new traffic signals at intersections of Del Paso Blvd. with Colfax Street/Southgate Road and Baxter Street.
- Replacement of two-lane bridge at Norwood Ave. over Arcade Creek with sidewalks and widened shoulders.
- On R Street between 2nd and 18th Streets, paving and streetscape improvements, including curb, gutter, sidewalk, accessibility features, landscaping, lighting, and street furniture.

Sacramento County: Antelope Road widening between Watt Ave. and Roseville Rd. to address congestion, safety and aesthetics, and mobility for bicycles, pedestrians and transit.

City of West Sacramento: Streetscape improvements on West Capitol Ave. from Sycamore Ave. to Harbor Blvd., including wider sidewalks, flatter road cross-section, reconfigured lanes, utility relocation, new lighting, hardscape and landscaping improvements.

City of Woodland: Streetscape improvements on Main Street between Third and Sixth Streets, including improved sidewalks, landscaping, trees, bulb-outs, A.D.A. ramps, and pedestrian-actuated signals.

Yuba City: Walton Ave. widening from Lincoln Rd. to Franklin Rd., including upgrades to bike lanes, sidewalks, curbs, gutters, and drainage.

Yuba County: Improvements to Olivehurst Ave. from 7th Ave. to McGowan Pkwy, including curb and gutter, sidewalks, bicycle lanes, center turn lane, improved transit stops, and drainage improvements; and new sidewalks and bicycle lanes on Powerline Rd. from 9th to 15th Avenues.

A complete list of projects is in Appendix A-1. As a result of these investments and the MTP/SCS land use pattern, walking and bicycling are expected to increase as a mode share in the region in both EJ and Non-EJ Areas, as shown in Table 8.8.

Table 8.8

Bike and Walk Mode Share in the SACOG Region, 2008 & 2035

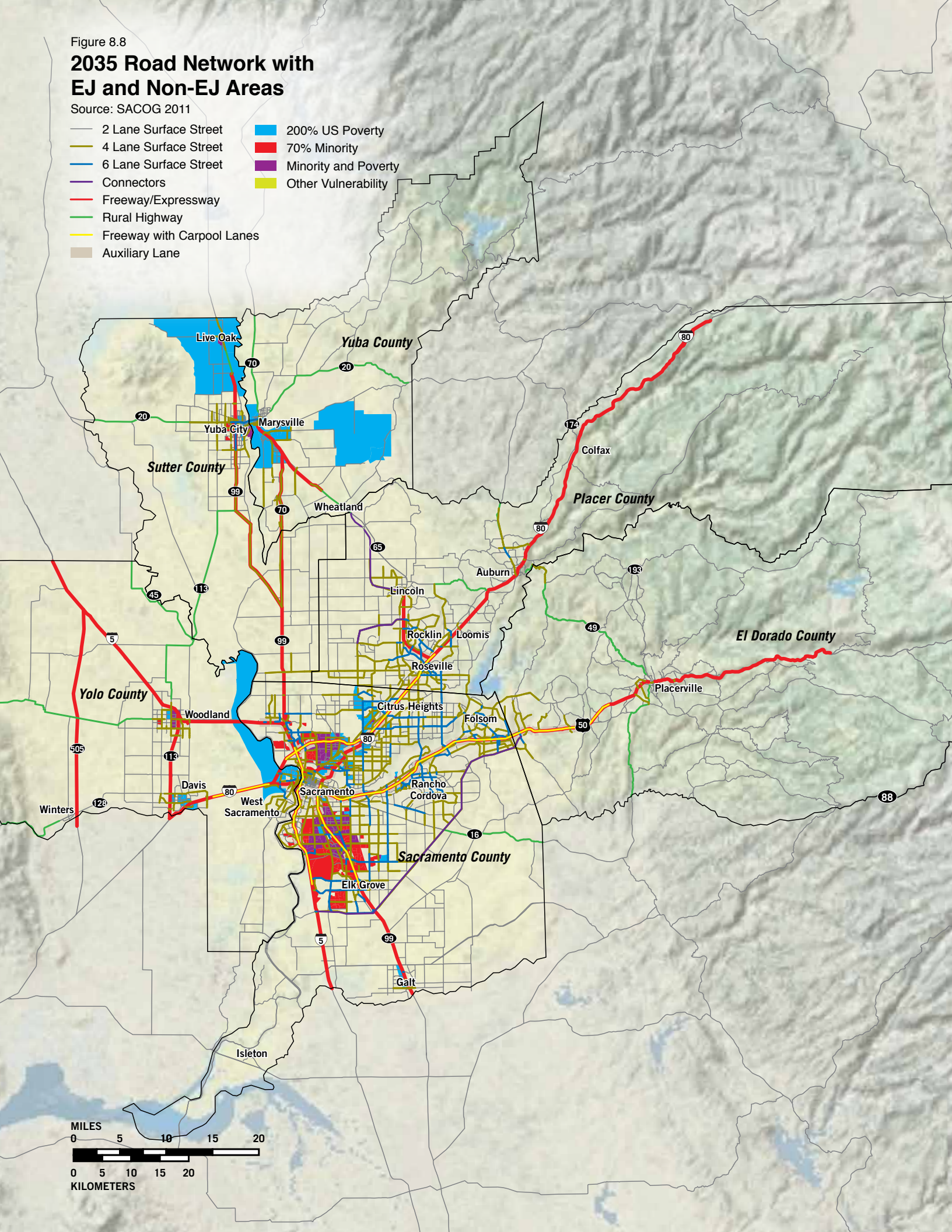
Area	2008	2035
EJ Areas	11.3%	13.6%
Non-EJ Areas	7.4%	7.8%

Source: SACOG, September 2011.

Figure 8.8

2035 Road Network with EJ and Non-EJ Areas

Source: SACOG 2011



Auto Accessibility

As noted earlier, a majority of EJ Area residents travel by personal vehicle to their destinations, as do a majority of Non-EJ Area residents. For this reason, this analysis also examines the effect of the MTP/SCS on access by auto from both EJ and Non-EJ Areas to key destinations. It is important to note that SACOG uses the same methodology for assessing auto accessibility as for transit accessibility, so the explanations and caveats for performance measures found in the transit accessibility section apply to measurements of auto accessibility as well.

As noted previously, this analysis uses a weighted average for the jobs, higher education enrollments, and park acres that can be accessed by car. Auto travel time is calculated as the time spent driving from home to destination, including time to park.

Job Access by Car

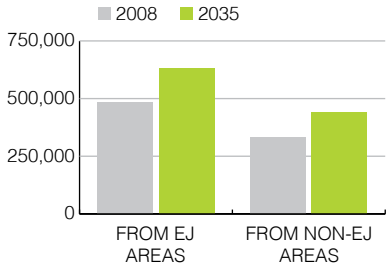
As shown in Figure 8.9, access to jobs within a 30-minute drive increases. Jobs that can be accessed increase by 30 percent from EJ Areas and 32 percent from Non-EJ Areas between 2008 and 2035. Increases are similar for auto access to retail jobs, 29 percent from EJ Areas and 28 percent from Non-EJ areas, although the total job base is lower.

Figure 8.9

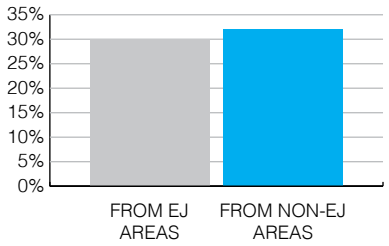
Auto Access to Jobs and Retail Jobs

Increase between 2008 and 2035 in Jobs Accessible within 30 Minutes by Car

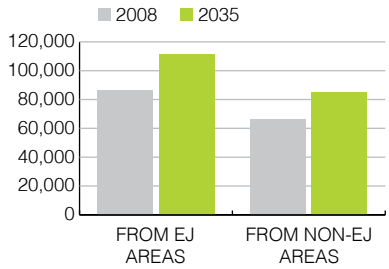
Auto Access to Jobs



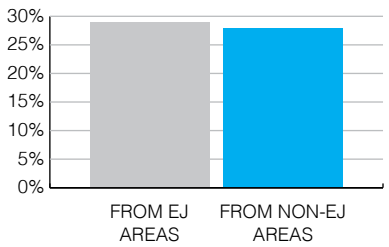
Increase in Jobs Accessible by Auto



Auto Access to Retail Jobs



Increase in Retail Jobs Accessible by Auto



Source: SACOG, September 2011.

Access to Medical Jobs

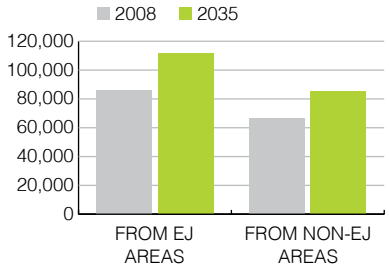
Figure 8.10 illustrates the approximately 35 percent increase in medical jobs that can be accessed within a 30-minute drive from both EJ and Non-EJ areas across the region. As with the transit access measure, SACOG is using medical jobs as the best currently available proxy for access to medical services.

Figure 8.10

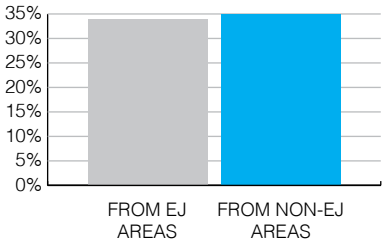
Auto Access to Medical Jobs

Increase in Medical Jobs Accessible within 30 Minutes by Car, 2008–2035

Auto Access to Medical Jobs



Increase in Medical Jobs Accessible by Transit



Source: SACOG, September 2011.

Higher Education Access

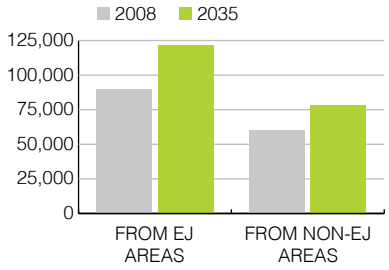
Auto access to higher education also improves for residents of both EJ and Non-EJ Areas in the region. Figure 8.11 shows these increases in auto access within 30 minutes to higher education enrollments.

Figure 8.11

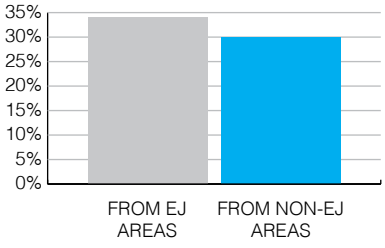
Auto Access to Higher Education, 2008–2035

Increase in Higher Education Enrollments Accessible within 30 Minutes by Car

Auto Access to Higher Education Enrollments



Increase in Higher Education Enrollments Accessible by Auto



Source: SACOG, September 2011.

Access to Parks

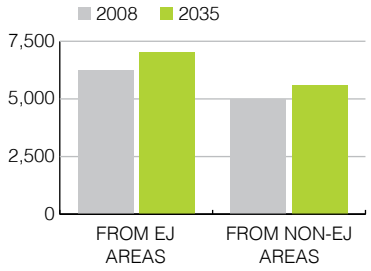
Lastly, SACOG measured the improvement in auto access to parks between 2008 and 2035. By 2035, as shown in Figure 8.12, park acres accessible by car increase by 13 percent from EJ Areas and 12 percent from Non-EJ Areas.

Figure 8.12

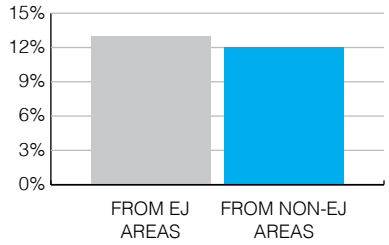
Auto Access to Parks

Increase in Park Acreage Accessible within 30 Minutes by Car

Auto Access to Park Acres



Increase in Park Acres Accessible by Auto



Source: SACOG, September 2011.

Transit and Auto Access Comparison

SACOG also conducted a regional analysis comparing transit and driving access within 30 minutes from EJ and Non-EJ Areas. Table 8.9 shows the change over the plan period in the percentage of the region's total jobs, higher education enrollments, and park acreage that can be accessed by transit and car from EJ and Non-EJ Areas within 30 minutes. Table 8.10 also uses a weighted average for the jobs, higher education enrollments, and park acres that can be accessed by transit or driving.

Table 8.9 indicates that regionally, transit accessibility within 30 minutes to jobs, medical jobs, and higher education is projected to improve for residents of EJ Areas, but auto accessibility from EJ and non-EJ Areas to jobs declines slightly when viewed from a region-wide perspective. This can likely be explained by the MTP/SCS's emphasis on employment growth and transit improvements particularly in Centers and Corridors and Established Communities. While transit access improves for these areas over the plan period, driving to these infill areas in 2035 may take longer for more outlying residents, slightly reducing the number of destinations that can be reached within a 30-minute drive.

However, not surprisingly for our region, driving will continue to provide greater access than transit. By 2035 from EJ areas, about 50 percent of the region's jobs and medical jobs, and nearly 70 percent of higher education enrollments will be accessible within 30 minutes by car, compared with around 10 percent of jobs and 18 percent of higher education enrollments that are accessible within 30 minutes by transit. This is not unexpected, given that transit often takes longer for similar trips due to routing, stops, and transfers, and does not serve all locations.

From Non-EJ Areas, about 35 percent of the region's jobs and medical jobs and 45 percent of higher education enrollments will be accessible within 30 minutes by car and about 6 to 8 percent by transit. This difference is likely because Non-EJ Areas include more Developing and Rural Residential Communities with less local employment, fewer college campuses, lower levels of transit service, and from which workers and students tend to commute longer distances by car.

For park access, by 2035 residents of EJ Areas are expected to have access to about 40 percent of the region's park acres by car but only 5.5 percent by transit within 30 minutes. Residents of Non-EJ Areas are projected to have access to 32 percent of the region's park acres by car vs. 4 percent by transit within 30 minutes. As discussed previously, SACOG plans to continue refining these performance measures over time.

Table 8.9

Comparison of Transit and Driving Accessibility within 30 Minutes from EJ and Non-EJ Areas

	Percent of Regional Total Accessible within 30 Minutes by Transit		Percent of Regional Total Accessible within 30 Minutes by Car	
Type of Accessibility	**from EJ Area**	**from Non-EJ Area**	**from EJ Area**	**from Non-EJ Area**
Jobs 2008	7.1%	5.8%	49.8%	34.4%
Jobs 2035	10.5%	6.3%	47.4%	33%
Medical Jobs 2008	10.7%	6.7%	52%	36.3%
Medical Jobs 2035	11.1%	7%	49%	34.2%
Higher Education Enrollments 2008	13.7%	8.4%	68%	45.3%
Higher Education Enrollments 2035	17.7%	8.2%	70.2%	45.2%
Park Acres 2008	5.5%	4%	40.6%	32.5%
Park Acres 2035	5.5%	3.8%	39.4%	31.5%

Source: SACOG, September 2011.

Toxic Air Contaminants

A final addition to SACOG's EJ analysis this year examines areas near major roadways that may be a source of toxic air contaminants. The California Air Resources Board in 2005 developed guidance stating that "sensitive receptors" (homes, schools, day care centers, parks, hospitals, etc.) be located outside a 500-foot buffer of major roadways, defined as freeways or urban roads with traffic volumes of 100,000 or more vehicles per day or rural roads with 50,000 or more vehicles per day.[11]

[11] California Air Resources Board, Land Use and Air Quality Handbook: A Community Perspective, 2005

Table 8.10 shows the percent of the population within and outside this 500-foot buffer in EJ and Non-EJ Areas in the region. In both 2008 and 2035, the percentage of total EJ Area population exceeds the percentage of total Non-EJ Area population within the buffer zone by about 2:1; however combined, both EJ and Non-EJ Area population within the buffer zone represent only 2 percent of the entire region's population.

Table 8.10

Population within and Outside 500-Foot Buffer of High-Volume Roadways, 2008 & 2035

	2008—within 500' Buffer		2008—Outside 500' Buffer	
% of Regional Population	**2%**		**98%**	
County	% of Total EJ Area Population	% of Total Non-EJ Area Population	% of Total EJ Area Population	% of Total Non-EJ Area Population
El Dorado	N/A	0.3%	N/A	99.7%
Placer	N/A	1.3%	N/A	98.7%
Sacramento	3.7%	2.2%	96.3%	97.8%
Sutter	0%	0.0%	100%	100%
Yolo	3.1%	0.5%	96.9%	99.5%
Yuba	0%	0.0%	100%	100%
Region Total	**3.3%**	**1.6%**	**96.7%**	**98.4%**
	2035—within 500' Buffer		**2035—Outside 500' Buffer**	
% of Regional Population	**2.4%**		**97.6%**	
County	% of total EJ Area Population	% of total Non-EJ Area Population	% of total EJ Area Population	% of total Non-EJ Area Population
El Dorado	N/A	0.3%	N/A	99.7%
Placer	N/A	1.1%	N/A	98.9%
Sacramento	4.6%	2.7%	95.4%	97.3%
Sutter	0%	0%	100%	100%
Yolo	3.5%	1.3%	96.5%	98.7%
Yuba	0%	0%	100%	100%
Region Total	**4%**	**1.8%**	**96%**	**98.2%**

Source: SACOG, September 2011.

The science behind such environmental hazards analysis is evolving. The Sacramento Air Quality Management District (SMAQMD) has developed its own guidance for project developers to use in assessing potential risks to residents from siting in particular locations, and mitigation strategies to address any identified risks. According to SMAQMD, risk is highly site-specific. The height of nearby freeways, prevailing winds, and other factors can make a significant difference in whether potential development sites pose elevated risks or not. Risks are different for children, seniors and those with certain health conditions than for healthy adults, and are based on a standard 70-year exposure, although many people do not necessarily live in the same location for 70 years.

At the same time, a statewide discussion has been taking place among affordable homebuilders, equity interests, and public health experts seeking to better understand the relationship between infill development and public health.

Through discussions with SMAQMD, academics and these interests, SACOG has identified a number of considerations for assessing exposure to high-volume roadway toxic air contaminants:

- SACOG does not have the capacity to assess every individual site within the buffer zone for potential variations in risk, but SMAQMD asks developers to conduct assessments on a project-by-project basis to assess risk for planned residents or users.
- There are tradeoffs between the health benefits and risks of siting new residential development in infill areas near transit, which often runs on major roadway corridors. Risks of exposure to toxic air contaminants from proximity to high-volume roadways may need to be weighed along with such benefits as better transit access to health care, lower transportation costs that leave more money for medical care, and new higher quality housing and increased physical activity for residents that can help improve health.
- State and federal agencies provide points in competitive housing funding programs for affordable home developments near frequent transit, recognizing that lower income residents tend to be more transit-dependent.
- Increasingly cleaner vehicles are reducing some of the health risks from air contaminants. Strategies exist to mitigate risks, such as siting residences and sensitive receptors away from the roadway, reducing windows facing the freeway or roadway, installing HVAC systems and planting trees that filter out air contaminants, etc.

Given the site-specific nature of exposure risk and available mitigation strategies, it is likely that the population that may experience exposure risk is even less than the 2 percent of the population in SACOG's analysis. In addition, of the small number of residents within the buffer zone in EJ and Non-EJ Areas, it is likely that the population is diverse in ethnicity and income level, especially by 2035. Trends that will likely continue to geographically decentralize the concentrations of EJ populations compared to today, together with the inherent limitations in estimating impacts on EJ compared with Non-EJ populations in 2035 when SACOG is not able to project the location of the new population within these two categories, likely mean that these data over-state the differences between EJ and Non-EJ populations for exposure to air contaminants. SACOG simply has no way of further quantifying these effects at this time.

SACOG sees the addition of high-volume roadway exposure as a performance measure as a first step towards identifying the effects on EJ and Non-EJ Areas of environmental hazards. The Air Resources Board has also developed guidance for siting sensitive receptors near other permitted sources of toxic air contaminants, such as chrome plating operations, dry cleaners using perchloroethylene, petroleum refineries, and large gasoline dispensing facilities. SACOG is also seeking to identify these uses in the region and the potential for exposure. SACOG plans to expand its capacity to analyze environmental hazards and infill tradeoffs in future MTP/SCS.

Strategies

Chapter 6 contains a number of policies and strategies SACOG intends to pursue to help implement the MTP/SCS consistent with the Blueprint Principles and Rural-Urban Connections Strategy, support local governments with data, tools, analysis and technical assistance, and address roadway, transit, goods movement, bicycle/pedestrian, and other transportation needs in the region.

As part of its work to begin the implementation of SB 375 and establish greenhouse gas emissions targets, the California Air Resources Board convened a Regional Targets Advisory Committee (RTAC). The RTAC developed a series of recommendations for SB 375 implementation, including development of performance indicators to help ARB monitor regional performance and update regional targets, and for MPOs to use to document their progress over time. Their recommendations include the following:

- Social equity factors should be incorporated in the 2010 greenhouse gas target setting to the extent modeling or "off-modeling" methodologies exist and in subsequent adjustments to the targets pursuant to Cal. Govt. Code §65080(b)(2)(A)(iv). Social equity factors include, but are not limited to, housing and transportation affordability, displacement/gentrification, and the jobs-housing fit.
- ARB should take all steps necessary to ensure completion of the appropriate research and model development so that social equity factors are fully incorporated into the greenhouse gas modeling for the second SCS round and before any adjustments to the targets.
- Adverse social consequences of changing land use patterns, such as displacement, gentrification and increased housing costs should be addressed and specifically avoided to the extent possible in the SCS/APS submitted by MPOs pursuant to Cal. Govt. Code § 65080(b)(2)(I)(i) and in the SCS/APS submitted to ARB pursuant to Cal. Govt. Code § 65080(b)(2)(I)(ii).
- To the extent adverse social consequences cannot be avoided they must be mitigated to the extent feasible.
- ARB should encourage the MPOs to develop and enhance "visioning" tools that enable the public and policymakers to clearly see the social equity impacts of various planning scenarios and make informed choices. These include impacts on air quality, access to transit, household transportation costs, housing costs and the overall housing supply.
- Regional and statewide model improvement efforts should incorporate housing affordability and social equity factors. From RTAC recommendations, "We encourage the state to identify and pursue the necessary research efforts and model development efforts that would support the development of this capability."[12]

SACOG is committed to deepening its ability to analyze and address RTAC recommendations and ongoing performance considerations in its planning activities. Specific areas where SACOG hopes to build analytical capacity and expertise for future MTP/SCS and planning efforts include:

- Jobs-Housing Fit and Housing plus Transportation Cost measures. Development of these measures is underway to increase the understanding of SACOG and its members of local housing costs and their relationship to local wages paid and transportation costs, to help support housing and transportation planning efforts.
- Refinement of MTP/SCS projections of the location of future populations, housing and employment, and of performance measures such as medical, higher education, and park access.
- Environmental hazard measures to reflect evolving science and address evolving legal requirements for environmental analysis.
- Measures of public health benefits of planning efforts, such as access to food, walkability, etc.
- Measures of benefits to youth as the future residents of the region.

[12] Recommendations of the Regional Targets Advisory Committee (RTAC) pursuant to SB 375, http://www.arb.ca.gov/cc/sb375/rtac/report/092909/finalreport.pdf, pp. 29 and 46.

Chapter 9

Economic Vitality

Efficiently connect people to their communities and get goods to market

Integrated land use and transportation planning support the region's economic vitality in several fundamental ways. These topics are discussed in four sections in this chapter: regional employment patterns in the region, the impact of land use and transportation planning on people's commute to work and travel during the day, how goods are transported through and within the region, and support for commerce and employment generally in the region.

Regional Employment Patterns

As discussed in Chapter 3, the Center for Continuing Study of the California Economy (CCSCE) develops the growth projections for the MTP/SCS. These technical inputs to the plan include projections of future employment (by major employment sector), population and household growth at the regional scale. These technical projections, focused on 2035 with interim projections developed for 2020, were presented to the SACOG Board at the start the MTP/SCS process and later adopted by the Board in June 2010 for use in developing the plan. The full CCSCE report on the region is located in Appendix D—Regional Growth Forecast.

The CCSCE notes that the SACOG region's economic base is currently dominated by two sectors: 1) federal and state government, including state colleges, and 2) professional, business and information services, which include computer services, architectural and engineering services, management and consulting services and management of companies. Together, these sectors account for nearly two-thirds of the region's economic base.

The region's share of the state economic base increased from 4.9 percent in 1990 to 5.7 percent in 2005, before stabilizing between 5.6 percent and 5.7 percent. However, the region saw variations in employment growth in different industry sectors. There was steady job growth in government and professional/business/information services during the 1990s, but job levels stabilized after 2000, as state government growth slowed. Wholesale trade and transportation, as well as tourism and entertainment, saw job gains during the 1990s and 2000s. High-tech manufacturing, diversified manufacturing and resource-based sectors (primarily agriculture) had relatively stable job levels during the past 20 years. High-tech jobs increased substantially in the 1990s and then declined after 2000.

In general, the SACOG region experienced job growth above the state average from 1990 to 2007, but the state's budget troubles and declining construction levels—which started even before the recession and were exacerbated by the national recession and financial market crises—then began to impact regional employment rates. In the four most urbanized counties (Sacramento, Placer, Yolo, and El Dorado) unemployment consistently hovered around 5 percent until mid-year 2007, but started increasing steadily to over 12 percent by 2010. In the two smallest and more rural counties (Sutter and Yuba), unemployment has varied widely. It averaged around 10 percent until late in 2007, but started increasing to between 18 and 19 percent by 2011.[1]

2020 and 2035 Job Projections

According to CCSCE, the years 2005-2010 saw a halt to California's job gains due to: 1) declines in construction activity; 2) lack of tech job growth; 3) large exposure to a downturn in foreign trade and tourism; and 4) state budget cuts and governance issues with statewide impacts.

However, CCSCE projects that California and the SACOG region will begin to outpace the nation in job growth again in the coming decades:

- CCSCE projects California will have 11.6 percent of U.S. jobs in 2020 and 11.7 percent in 2035—although these gains are below what was expected five years ago, and closer to the high share seen in 1990.
- CCSCE forecasts that the SACOG region's share of this job base will increase from 6 percent in 2008, to 6.2 percent in 2020, to 6.6 percent in 2035. Job levels in the region are projected to increase on average by 1.1 percent per year to 2035, compared with a 0.6 percent annual U.S. job growth rate and a 0.7 percent annual state job growth rate.
- CCSCE projects that the region's employment will grow more slowly than in the 2005 projections that were the basis for the 2008 MTP, especially in the early years of the plan, and more slowly than the rate of population growth through 2035. Numerous factors are expected to restrain job growth in the region to 2020, including:
  - Slower national and state growth rates, in part due to reduced immigration rates in the short-term.
  - Slow recovery expected in the housing market—although lower home prices make the area more attractive to potential businesses and residents.
  - State budget challenges that may continue to affect job and income levels in state government, the region's largest economic base sector.
  - Aging and eventual retirement of the baby boomers, affecting both employment and housing demand.

Despite these short-term dynamics, the SACOG region's long-term prospects are good, with the region expected to capture an increasing share of California jobs, particularly in the period from 2020 to 2035. Government sector jobs will be a source of growth, particularly after 2020.

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[1] SACOG Regional Transportation Monitoring Report, April 2010, p. 12.

The professional and business services sector—which serves state government and includes the fast-growing computer, architectural and engineering, scientific and R&D laboratory services industries—is also expected to resume growth in the future. Although construction job levels will likely impair growth in the short term, they are expected to rise in response to long-term population growth and a housing rebound.

The 2035 forecast also assumes that the region will expand health care to meet the growing needs of the aging population, and capture a significant share of new jobs in one or more of the state's new industries such as clean tech or health care technology (e.g., biotech or electronic medical records). These projections assume the region will participate in a significant way in the growth of such innovative activities, either as a result of business development catalyzed through such regional resources as UC Davis, and/or as a result of spillover from job growth in the Bay Area as occurred in the technology boom of the 1990s. In addition, SACOG's RUCS project (discussed in more detail later in this chapter) is looking at ways to promote more rural economic growth and enhance the region's agricultural industry, energy production, and environmental services that contribute to the region's economic vitality.

CCSCE's job forecast was translated into the land use pattern of the MTP/SCS. Table 9.1 shows which major industry sectors CCSCE has projected to grow more quickly or slowly through 2035. Construction, professional and business services and educational and health services are projected to grow substantially more quickly than total jobs. Manufacturing and retail trade are projected to grow substantially more slowly than the regional total. Other sectors are projected to grow at slightly above or below the regional total.

Table 9.1
Projected Percentage Growth in Jobs by Major Industry Group through 2020 and 2035

Industry	2008–2020	2008–2035
Agriculture	2.3%	4.7%
Mining	9.1%	-18.2%
Construction	39.6%	74.7%
Manufacturing	-8.5%	-21.3%
Wholesale Trade	10.1%	18.3%
Retail Trade	9.4%	15.6%
Transportation, Warehousing and Utilities	6.8%	21.7%
Information	4.6%	12.2%
Financial Activities	16.8%	31.2%
Professional & Business Services	37.7%	72.7%
Educational & Health Services	24.4%	58.3%
Leisure & Hospitality	11.4%	28.7%
Other Services	12.9%	38.9%
Government	5.8%	20.2%
Self Employed	9.7%	33.0%
Total Jobs	**14.7%**	**33.5%**

Table 9.2 shows how these changes contribute to a rising or declining share of total jobs in the region.

Table 9.2
Percent of Total Jobs in the SACOG Region by Major Industry Group, 2000–2035

Industry	2000	2008	2020	2035
Agriculture	1.6%	1.3%	1.1%	1.0%
Mining	0.1%	0.1%	0.1%	0.1%
Construction	6.0%	5.7%	6.9%	7.4%
Manufacturing	5.5%	4.0%	3.2%	2.4%
Wholesale Trade	2.8%	2.7%	2.6%	2.4%
Retail Trade	10.4%	9.9%	9.5%	8.6%
Transportation, Warehousing and Utilities	2.7%	2.6%	2.4%	2.3%
Information	2.1%	1.9%	1.7%	1.6%
Financial Activities	5.8%	5.8%	5.9%	5.7%
Professional & Business Services	12.0%	11.1%	13.3%	14.3%
Educational & Health Services	8.1%	10.3%	11.2%	12.3%
Leisure & Hospitality	8.0%	8.8%	8.5%	8.4%
Other Services	3.0%	3.0%	2.9%	3.1%
Government	24.1%	24.4%	22.5%	22.0%
Self Employed	7.7%	8.4%	8.1%	8.4%
Total Jobs	**100%**	**100%**	**100%**	**100%**

Source: 2000, 2008 California Employment Development Department; 2020, 2035 CCSCE

Moving People to Work: Commuting and Congestion under the MTP/SCS

Traffic congestion is an inescapable result of robust economic activity and life in modern metropolitan areas. A lack of congestion during peak periods actually indicates that facilities have been overbuilt, usually at significant cost. However, too much congestion has negative economic impacts. At a regional level, excessive congestion can be a factor in shifting development from one area within a region to another or to economic leakage to another region altogether. Thus, when corridors become congested, it is important to accommodate all travel modes effectively so travelers have effective choices and residents and commercial vehicles can reach their destinations in a timely way. The Texas Transportation Institute (TTI) reported that in the Sacramento region, congestion in 2010 led to over 29.6 million hours of travel delay and $603 million in congestion costs (calculated as the costs of delay, fuel and truck congestion).[2] For individuals, significant congestion leads to longer commutes and higher household transportation costs.

While the Sacramento region has seen reductions in commuting and congestion due to the economic downturn and higher unemployment levels, congestion still affects current commuters on many of the region's highways and roadways, and is expected to remain an issue as the economy recovers and population and jobs increase. True congestion appears at about 85 percent of road capacity and thereafter worsens dramatically with an increase of only a few hundred vehicles in the peak period. About half of congestion delay results from demand reaching or exceeding regular roadway capacity. The other half occurs due to incidents where capacity is temporarily compromised: through accidents, stalled vehicles, spilled loads, roadside distractions, police stops, work zones, and weather.

Congestion is presently a result more of local traffic than interregional travel. Interregional trips comprise only about 16 percent of daily traffic on Interstate 5 through downtown Sacramento, and about 12 percent on Interstate 80 through Roseville. Interregional trips affect local commute congestion more on Friday evenings, when pass-through recreational traffic to the Lake Tahoe area tends to be concentrated.

Congestion is not confined to urbanized areas. Rural roads along the region's urban-rural edge are also subject to delay. Roadways that serve adjacent rural land uses can exhibit considerable fluctuations in peak and off-peak traffic volume if nearby developments or bottlenecks on major commuter routes result in drivers using rural roads as supplementary commuter routes. In some instances, recreational opportunities can create similar delays as they draw traffic from urban areas onto rural roads. For example, holiday and weekend traffic near the region's many agricultural tourism sites (e.g. wineries, Christmas tree farms), while benefitting the rural economy, create localized traffic congestion and parking issues on roads that are otherwise lightly used.

The statement, "we cannot build our way out of congestion," is essentially correct, because large metropolitan regions such as ours lack the resources and ultimately the space to provide for uncongested vehicle travel. Gas taxes supported the robust highway construction program of the 1950s and 1960s. That construction boom built the region's trunk highway and arterial system, which has since been surrounded by urban development, making it difficult and costly to expand. State and federal gas taxes have not kept pace with inflation and have been supplemented with local sales taxes and development-based funds to pay for road expansion and maintenance. These local sources of revenue provide critical funding support for new projects, but are volatile and have eligibility constraints and typically need to be spent on improvements to areas in close proximity to the new development, even if the development causes significant impacts to the larger transportation network.

The Sacramento region faces a number of challenges in implementing land use and transportation patterns to address employment and commute needs and congestion over the plan period. The following section provides a more detailed discussion of these challenges.

Commute Volume, Distance, and Mode Choice

As noted in Chapter 5B, home-to-work trips comprise only 18 percent of all trips made in the region. However, commute trips account for nearly 24 percent of all vehicle trips and 44 percent of all VMT. Commuting adds about a third more trips during the two peak periods, 7:00 to 10:00 a.m. and 3:00 to 6:00 p.m. Commuting is not only important economically in moving people to and from work, but also in its peak period impact on the transportation system.

Commute trips tend to be lengthier and use freeways and major arterials more, intensifying their effect on the regional system. For most people, the commute trip is the longest trip of the day; however, most commute trips are shorter than media attention on extra-long commutes implies. Regionally, the average commute trip length is 12.5 miles. Only 5 percent of commute trips in the region are 35 miles or longer. Ninety percent are shorter than 25 miles, and 75 percent are shorter than 15 miles. In the Sacramento region, one-third of workers lives and works in the same area, so their commute trips average less than five miles. Approximately 3 percent of workers have no commute at all, because they work at home.

[2] http://tti.tamu.edu/documents/mobility-report-2011-wappx.pdf, p. 25

During peak hours, over three-quarters of commute trips are made by people driving alone, when the transportation system is used at greatest capacity and congestion is highest. While solo driving is still the primary commute mode, some of the region's residents do make work trips via carpool/vanpool, transit, walking and bicycling. Table 9.3 illustrates the region's current commute mode shares.

Transit, bicycle and pedestrian commuting have been increasing. Bicycling and walking rates are slightly lower during peak commute periods than during the middle of the day; however, the percentage of commuters who bicycle or walk still outnumbers commuters who use public transit. Many transit operators in the region provide commuter service, especially to downtown Sacramento, the region's largest employment center. These services are capable of replacing individual commuter trips for distances as long as 50 miles one-way, and provide over 20,000 round-trips for commuters on weekdays. Travel by public transit is highest in the peak periods, but still carries less than 3 percent of all commute trips.

Table 9.3
Weekday Commuter Travel Mode Share in the SACOG Region, 2008

Mode of Travel	2008
Drive alone	76.4%
Carpool	14.7%
Public Transit	2.8%
Bike/Walk	3.2%
Work at home	3.0%

Source: SACOG, September 2011.

Regional Job Centers

Another key issue is the need to move approximately 100,000 workers to and from downtown Sacramento for work. This central city commute pattern, common in most large urban regions around the country, presents a peak capacity challenge to the core of both the region's highway and transit systems.

More than half of downtown Sacramento workers commute from close adjacent areas: established communities in Land Park, Pocket, Meadowview, South Sacramento, East Sacramento, North Sacramento, Natomas, and West Sacramento. About 30 percent of the new "commuters" to jobs in downtown Sacramento will reside in downtown Sacramento.

The continuing growth of Rancho Cordova and Roseville as major centers with strong employment and housing growth is also an important trend. By 2035, the MTP/SCS projects that commuting to Rancho Cordova will increase by nearly 50 percent, and by nearly 40 percent to Roseville; this verifies the place of these communities as two of the region's three main job centers. This leads to a commute pattern that strengthens economic interactions along the I-80 and S.R. 65 corridors in South Placer County and along the U.S. 50 corridor connecting Rancho Cordova and Folsom/El Dorado Hills. Under the MTP/SCS, commute patterns to the region's suburban job centers are expected to look like this:

- In Rancho Cordova, 43 percent of its new jobs are expected to be filled by residents of Rancho Cordova. The remaining new employees are expected to primarily travel in from areas north of the American River (Carmichael, Fair Oaks, Orangevale, Citrus Heights, etc.) and from Folsom and El Dorado Hills.
- In Roseville, about a third of new jobs are expected to be filled by Roseville residents, while the remaining two-thirds travel in from Lincoln, Rocklin, Loomis, unincorporated Placer County, and from areas in northern Sacramento County, including Antelope and North Highlands.

Commute Corridors

Today, I-5, I-80, U.S. 50, and S.R. 99 all experience up to 15 miles of congestion during morning and afternoon commute times, equating to 15 to 30 minutes of trip delay. The MTP/SCS plays an important part in planning for these and other major commute corridors.

U.S. 50 has a critical regional role as an economic corridor, with an estimated 330,000 jobs today and over 460,000 projected by 2035 (about one-third of the region's jobs) located nearby. Many of the workers in these jobs will use U.S. 50 for part of their commute, and it is also the key highway for commercial trips within the region. U.S. 50 east of downtown Sacramento now carries more traffic outbound in the morning peak than inbound, and it has become the region's first section of freeway with two-way congestion both morning and afternoon.

By 2035, the I-80/S.R. 65 corridor—connecting Natomas, North Sacramento, Roseville, and Lincoln—begins to look similar to U.S. 50 as a second key economic activity corridor, for both employment and commercial trips.

Some of Sacramento's worst congestion currently occurs on crosstown suburban arterials. Among those corridors with the greatest congestion are Watt Avenue, Sunrise Boulevard, Florin Road, and Douglas Boulevard. As in other U.S. metropolitan areas, Sacramento has developed major suburban travel patterns, but lacks sufficient infrastructure to accommodate those patterns.

Between 2008 and 2035, there is a noticeable change in the heaviest one-way commutes between community areas, indicating corridors that need new capacity looking ahead:

- Figure 9.1 shows major commuter flows in 2008 ; only two of the current 16 heaviest corridors increase significantly (by more than 25 percent) from 2008 to 2035 (see Figure 9.2), but eight new corridors appear on the list due to substantial new commute growth.
- Figure 9.2 shows where commuter flows between community areas are expected to exceed 8,000 per day by 2035. Only two of the "new" major commuter flows is to one of the three major employment centers (downtown Sacramento, Roseville and Rancho Cordova); six of the eight new flows are to other employment centers (e.g. Lincoln, Rocklin, East Sacramento, Elk Grove, North Sacramento, etc.).

Figure 9.1

2008 Major Daily Two-Way Travel Patterns

Weekday Commuter Flows (in 1,000s)
Shown are Commuter Flows
8,000 or more per day
SACOG 2011

--- City Boundaries

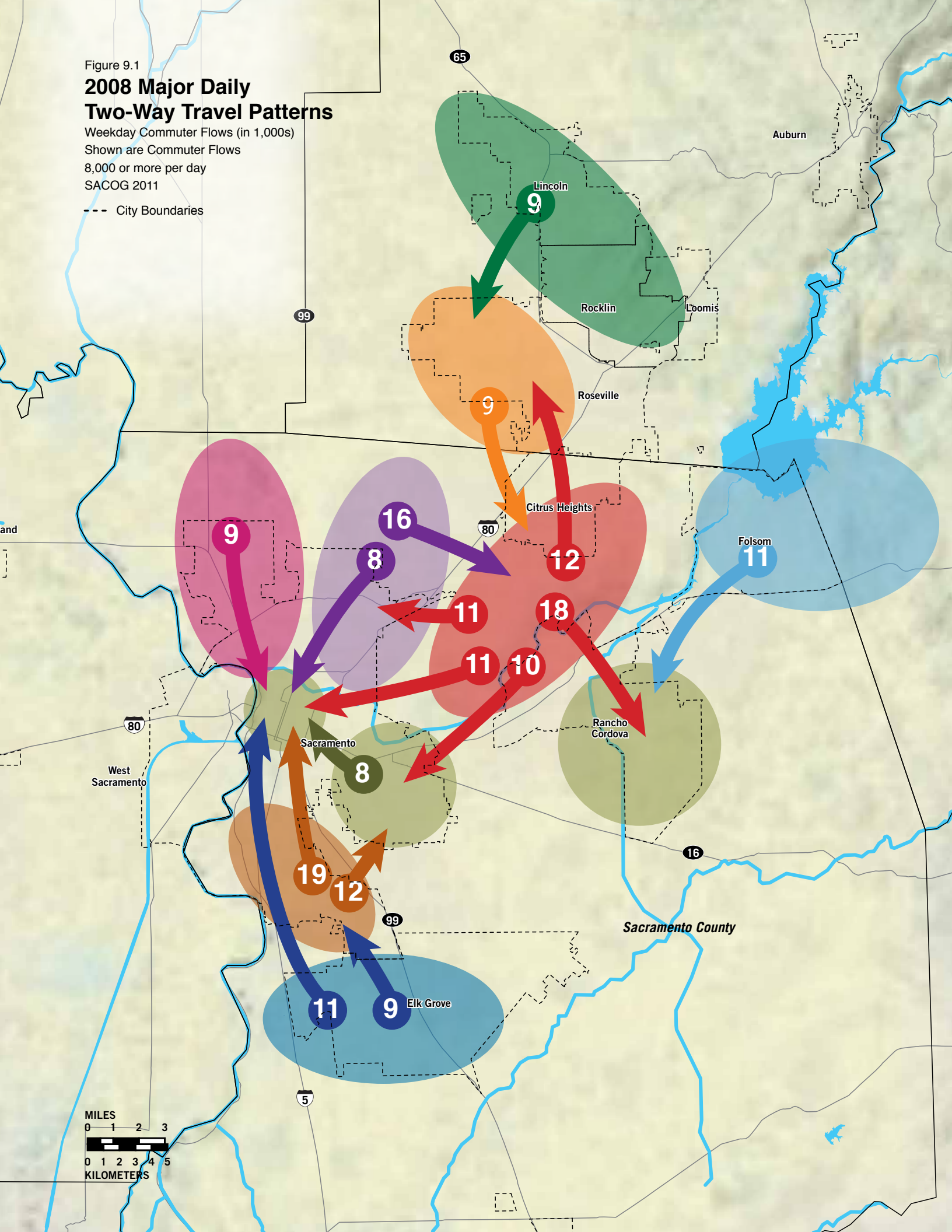
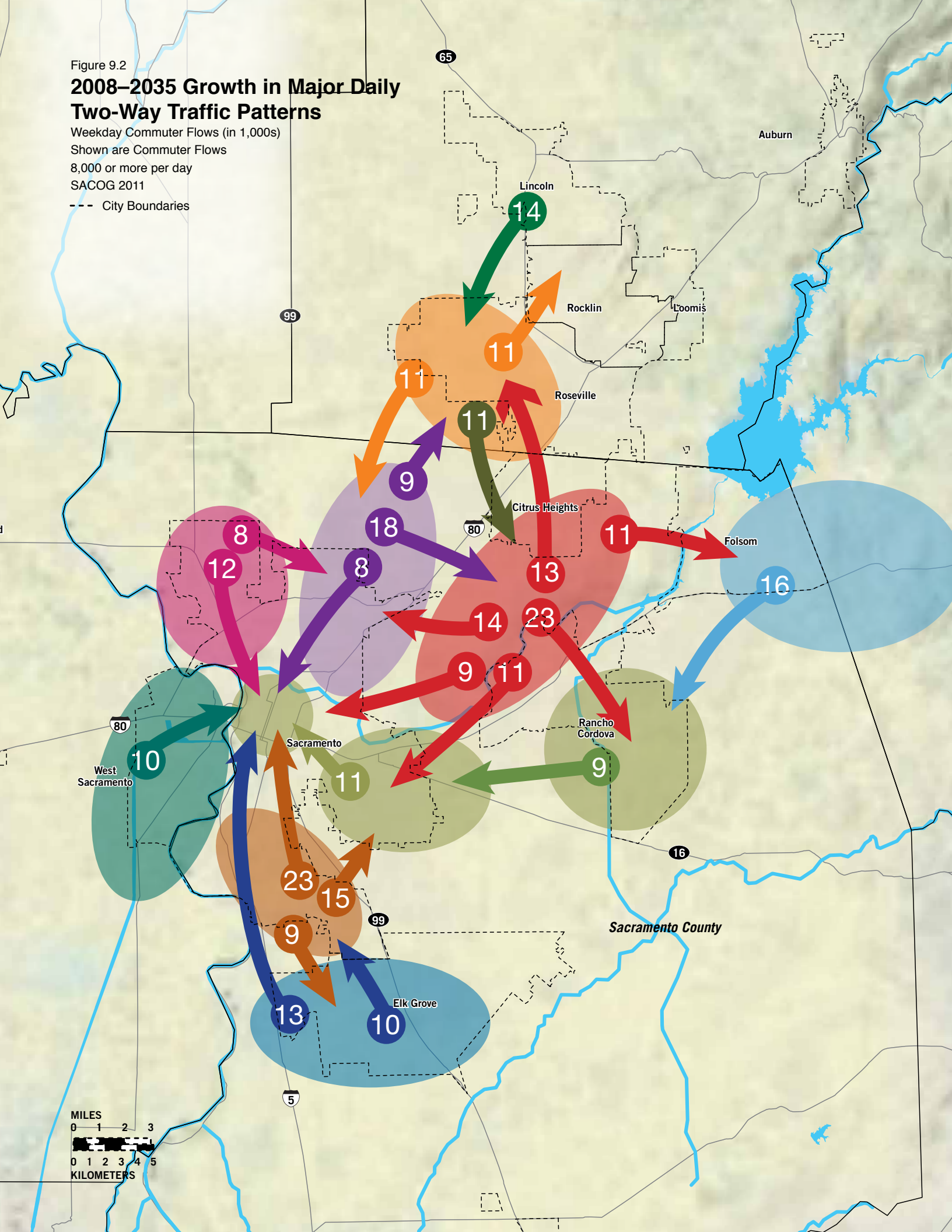


Figure 9.2

2008–2035 Growth in Major Daily Two-Way Traffic Patterns

Weekday Commuter Flows (in 1,000s)
Shown are Commuter Flows
8,000 or more per day
SACOG 2011
--- City Boundaries



Land Use Pattern Changes to Reduce Commuting and Congestion

The MTP/SCS land use pattern is designed to strengthen mixed-use activity centers across the region, supported by improved transportation mode choices. As described in more detail in Chapter 3, the land use pattern focuses on locating new jobs and services near existing homes or adding homes near job centers both to improve the employment-to housing-ratio in many communities, and to make efficient use of existing and planned transportation expenditures. In seeking to further implement the Blueprint Vision, the MTP/SCS plans for stronger connections to and between activity centers, such as regional job centers in downtown Sacramento, south Placer County, Rancho Cordova, downtown West Sacramento, UC Davis, and Yuba City/Marysville, as well as expanded and effective transportation choices for both commute and non-commute trips.

As described more fully in Chapter 3, the land use pattern of the MTP/SCS allocates 81 percent of projected new employment and 57 percent of new housing to the more central Established Communities and Center and Corridor Communities in the region. The land use pattern allocates another 42 percent of projected housing demand and 18 percent of employment demand to Developing Communities, most of which are located around regional job centers in southwest Placer County, southeastern Sacramento County, and urbanized Yolo County. Much of the MTP/SCS development in the region is also focused in Transit Priority Areas, located within a half-mile of existing and planned light rail stations, Capitol Corridor train stations, West Sacramento-Sacramento and Rancho Cordova streetcar/tram corridors, and numerous bus and bus rapid transit routes to reinforce and make the most of high quality transit service.

The MTP/SCS growth pattern includes significant housing growth in downtown Sacramento, to reduce the employment-to-housing imbalance in this already large employment center.. This will substantially increase the number of downtown workers who can take a short walk, bike or transit trip to work.

Although the MTP/SCS projects some long-distance commuting will continue to downtown Sacramento, Rancho Cordova, south Placer County and other major job centers, the per capita decline in vehicle miles traveled reflects improvement from today and the 2008 MTP. Land use changes in the MTP/SCS focused on a better jobs-housing ratio and greater mixing of uses, combined with high-quality transit corridors and more complete streets, will support more and shorter commute trips made by transit, biking, or walking, reducing some of the peak hour demand and congestion generated by solo driving.

Transportation Projects to Address Commuting and Congestion

The MTP contains a number of projects, described in more detail in Chapter 4, to address capacity needs and congestion on commute corridors through 2035. These include:

- Freeway high-occupancy vehicle (HOV) and auxiliary lanes, interchange improvements, and new river crossings;
- Key capacity expansions on parkways/major arterials;
- More transit service hours and routes, including nine new Bus Rapid Transit lines connecting Roseville, Citrus Heights, northern Sacramento County, Natomas, Downtown Sacramento, South Sacramento, Elk Grove, eastern Sacramento County, and Rancho Cordova; and
- Various street/corridor enhancements and operational improvements to support more rapid bus transit and other modes, including over 1,100 miles of Class 1 and 2 bike routes, a 77 percent increase regionwide.

As discussed in Chapter 5, a result of the MTP/SCS land uses and transportation network is improved travel performance:

- The commute share of household-generated congested VMT stays nearly level at 65 percent in both 2008 and 2035, rising only slightly to 66 percent in 2020.
- Between 2008 and 2035, the share of commute trips made via transit increases from 3 to 8 percent and from 3.5 percent to 4 percent by biking and walking.
- These mode shifts, along with roadway projects that help address key bottlenecks and additional river crossings, help reduce total congested VMT per capita by nearly 7 percent and household-generated congested VMT per capita by over 10 percent by 2035.

These improvements will help support worker and business productivity as the economy improves while maintaining roadway capacity for goods movement, discussed in more detail below.

Rural Commuting

As described in Chapter 3, the MTP/SCS allocates 1.7 percent of the projected housing demand and 1.1 percent of employment demand to Rural Residential Communities, and less than 0.5 percent of housing growth and 0.3 percent of employment growth to areas not identified for development during the plan period—far less than the 200,000 acres of farmland that transitioned to rural and urban uses between 1988 to 2005. Nonetheless, transitioning rural roads present a host of challenges, including increased peak-period congestion, road maintenance funding shortfalls, infrastructure deficiencies and safety concerns for drivers of farm equipment and personal vehicles.

In general, VMT is proportionately higher among residents of Rural Residential Communities and Lands not Identified for Development in the MTP/SCS than residents of more urbanized areas in the region. Often, destinations are inaccessible without a vehicle. While a number of transit agencies serve rural areas in the region, the time between buses can be long, and some areas are too low density and costly to serve more than a few times a day or week, if at all. There are over 850 miles of bicycle routes in the region in small urban or rural areas, but nearly 80 percent are on the shoulder of roadways, with many routes fragmented.

A key issue in rural commute patterns is the provision of reliable, safe, and affordable transportation for the region's agricultural employees, especially field labor. Agriculture contributes $3.33 billion per year to the regional economy. Supporting safe and reliable transportation options for workers in the agricultural industry makes sound economic sense.

A foundation of the agricultural economy is the 21,000 ongoing employees and thousands of seasonal farm workers in the region—many of whom do not currently have safe and reliable transportation. The seasonal farm worker's commute typically consists of widely varying shifts and locations, often with various employers throughout the year. This makes it impossible for traditional public transit to efficiently meet the needs of seasonal workers, but farm worker wages make owning and maintaining a personal automobile a significant financial burden. Vehicles that farm workers do own are often in poor condition, as maintenance costs are prohibitively expensive. Furthermore, a significant percentage of agricultural workers do not have a current driver's license or vehicle insurance. Farms are generally too spread out for walking or biking, and most rural roads do not have adequate bicycle and pedestrian facilities, even for short trips. Thus, workers are habitually transported from field to field by piling into crowded vans, or the back of pick-up trucks without important safety features such as proper seats and safety restraints. For these reasons, SACOG has entered into an agreement with CalVans to operate low-cost agricultural worker vanpools to help fill transportation gaps, especially in agricultural and more rural areas.

Goods Movement

The economic vitality of the Sacramento region is also dependent on the ability to transport consumer goods, which is critical to the viability of the manufacturing, distribution, and agricultural sectors. A region that has adequate goods movement infrastructure and is strategically located from a trade perspective can profit considerably from its ability to receive, sort, process and deliver goods and services quickly, inexpensively and effectively. Goods movement is one of many elements in regional competitiveness and can be a key tie-breaker in location decisions. Freight-dependent industries can be more easily attracted to regions with modern, uncongested infrastructure, and avoid locating along crowded highways or older arterials that restrict truck flow.

Current Goods Movement

Goods are transported in the Sacramento region using five primary modes, truck, rail, cargo ship, air cargo and pipeline, each with its own relative opportunities and constraints. Within the Sacramento region, an estimated 90.6 percent of freight tonnage is carried by truck, 2.9 percent by rail, 0.4 percent by ship and 0.1 percent by air. The remainder is carried by some combination of modes or by pipeline. It is important to remember that even freight moved by ship, plane or train still must almost always travel the "last mile" to its destination by truck.

Rail

Major western railroads operate near capacity today, and can only compete with trucks that haul goods for more than 700 miles. Freight train miles traveled continue to increase. They are forecasted to double by 2020 and double again by 2035, although very little new track is being added. A mile of track costs $3.5 million to construct and is approaching $500,000 annually to maintain. Given current economic conditions, railroads are not earning a high enough rate of return to significantly expand their main-line track.

Port

The Port of West Sacramento lies outside the congested Bay Area and nearer the Central Valley cargo market, with good connections via I-5, I-80 and railroad lines. The Port is currently experiencing a period of growth after several years of lackluster performance. The Port's initiative to attract green industries and its strategic alliance with the Port of Oakland has brought new activity and the chance for economic prosperity. The current Sacramento River Deep Water Ship Channel project will deepen the 43-mile ship channel connecting the Port to San Francisco Bay from 30 feet to 35 feet along its entire length. This will allow

more than 75 percent of fully loaded oceangoing freight ships to serve the Sacramento region, compared to less than 40 percent currently. When combined with the Marine Highway project, which will establish a new green trade corridor between West Sacramento, Oakland and Stockton, the channel-deepening project will enable the Port of West Sacramento to attract more green businesses, in addition to planned metals recycling, wood pellet, biofuel and solar facilities. The Port is also the major launching point for rice grown in the region to be exported to Asia and the Middle East. Active and planned improvements at the Port should continue if good connections are to be maintained in order to meet projected demand for more truck traffic that will carry containers, agricultural products and associated goods.

Air Cargo

Sacramento County has designated Mather Field as the region's air cargo facility, transporting over 41 tons or about 1.1 percent of the state's air cargo in 2010. However, Sacramento International Airport handled more air cargo than Mather in 2010: over 73,000 tons or nearly 2 percent of the state's cargo. Most of this volume is handled by "integrated carriers" such as FedEx, UPS, DHL, and Golden State Overnight, while "belly cargo" handled by passenger airlines accounts for the remainder.

Air cargo growth, while dramatic during the 1990s, slowed significantly after 2001. Between 2005 and 2010, air cargo dropped by 37 percent at Mather and 9 percent at Sacramento International Airport. Most of the region's air cargo is inbound, consisting of goods to meet the needs of the local population. As very little is manufactured in the region, there is considerably less demand for outbound air cargo. Planned improvements at Mather to accommodate more air cargo stalled as a result of litigation from local jurisdictions over noise issues.

Nonetheless, aviation plays a key role in the supply chain, especially in terms of high-value-added goods, like specialty agricultural crops. In California, airborne agricultural exports in 2004 totaled $659 million, an increase of nearly 60% since 2000. In addition, for high value-added crops like cherries, strawberries, asparagus, and organically raised produce, air cargo offers the only means for exploiting overseas markets. California's agricultural exports typically head to Japan, China, South Korea, Taiwan, and Hong Kong, while rail and truck facilitate trade with Mexico and Canada.

The Sacramento region is still a relatively minor player in the air cargo arena, as more than 90 percent of the state's airborne freight moves through Los Angeles or San Francisco area airports. With the economic downturn of recent years, it is unclear how well the Sacramento region is positioned to take advantage of that growth and increase its market share in the California air cargo industry. Most air cargo-related truck traffic consists of small delivery trucks with only a few larger 53' trucks. The only significant truck-related need that has been identified is for improved truck access to points north and south of Mather Field.

Pipelines

Petroleum products, specifically, gasoline, diesel and jet fuel, are transported by pipelines from the Bay Area to the Sacramento region. Approximately 400 local truck trips are dispatched every day from four Sacramento River terminals and the Bradshaw terminal to distribute gasoline and diesel fuel throughout the region.[3]

Trucking

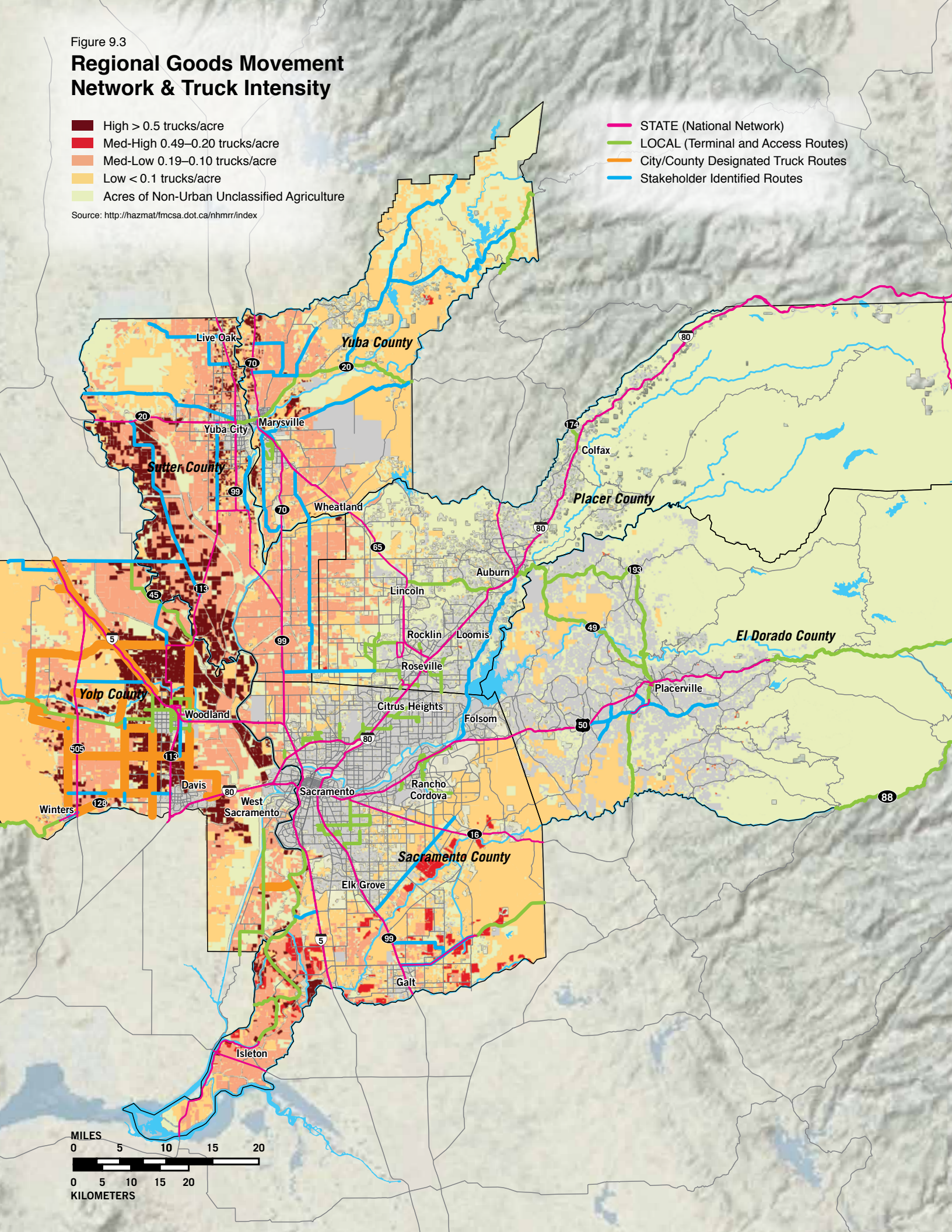
Increasingly, freight shipment is being carried by truck, a trend likely to continue. Both Interstate 5, linking the Sacramento region and Central Valley with southern California seaports, and Interstate 80, linking the Bay Area, Sacramento, and areas east of the Sierra, are major truck freight routes through the region.

Average daily truck volumes on the region's freeways range from around 3,000 per weekday on Route 70 and 4,100 on U.S. 50, to 8,000 on SR 99 and Interstate 80 and 10,650 on Interstate 5. Figure 9.3 shows the goods movement network and intensity of agricultural trucking in the region, measured in trucks per acre. . As businesses move to suburban areas with limited highway access, more of the truck trips internal to the region must also use arterial roads. Existing industrial re-use areas are not typically alongside freeways, but located on arterials such as Power Inn, North Watt, and Sunrise.

[3] SACOG Goods Movement Study, 2007

Figure 9.3

Regional Goods Movement Network & Truck Intensity



Source: http://hazmat/fmcsa.dot.ca/nhmrr/index

The amount of freight generated by a location is a function of many factors, among them the volume of commerce in the region, the economic health of particular business sections, technology changes, trade agreements, the climate for business production and innovation, and government policies, programs and regulations.

The flow of goods in the Sacramento region includes goods being moved to, from, or entirely within the region. In spite of being at the crossroads of northern California's major highways, less than a quarter of goods travel straight through the region. Looking at the volume of goods being moved:

- According to the FHWA's Freight Analysis Framework, about 29 percent of these movements are internal—entirely within the region. Anecdotal input suggests this percentage is actually higher because local freight movements are difficult to obtain and often under-reported. The makeup of shipments that stay within the region includes about 35 percent gravel and other non-metal mineral products, 20 percent gasoline and petroleum products and 9 percent waste or scrap.
- Another key segment of goods flow, at 33 percent, is freight coming into the region from somewhere else.
- Next is the volume of through-movements of goods, at about 22 percent. The region is located at the crossroads of I-5 and I-80 and at the junction of major north-south and east-west rail lines as well.
- Finally, the smallest of the four freight flows involves exports from the region to other areas, at about 16 percent of total volume. Basic manufacturing of goods makes up a small part of Sacramento's economy. The only sizeable export is agricultural, both fresh and processed foods.

Goods Movement and the Agricultural Economy

Comprehensive goods movement infrastructure is essential to the vitality of the agricultural economy in the SACOG region, where farmers and ranchers produce approximately 3.4 million tons of food annually. For example, 93 percent of the 1.8 million tons of vegetables produced are tomatoes, most of which leave the region for processing. Similarly, 90 percent of the 760,000 tons of grain produced in the region is rice, the vast majority of which is exported to Asia and the Middle East. In some cases, the products shipped out of the region for processing travel the very same roads when they are shipped back into the region as final products.

Agriculture depends upon rural roads, highways, and freeways. During the growing season, farmers use rural roads to move farm equipment between fields, and farmworkers use rural roads to get to work. Smaller producers also rely on rural roads to access local markets. At harvest time, large trucks use rural roads and state and interstate highways to transport raw products to post-harvest and processing facilities. From July to October 2007, 650 trucks were required daily to haul tomatoes grown on more than 52,000 acres in Sacramento, Sutter, and Yolo counties to processing facilities from Woodland to Bakersfield.

Raw products are often shipped out of the SACOG region for processing. Whereas processing plants were previously scattered around the region, today many have been consolidated, particularly in the central and southern San Joaquin Valley. Finished products are then trucked to distribution facilities, retailers, direct marketers, institutions, restaurants, community food banks, or straight to consumers.

Getting a product from the farm to the consumer requires the transportation system to accommodate a variety of uses. The importance of goods movement to sustaining the region's rural economies makes it essential to maintain a robust network of routes that serve farms, processing facilities, and distribution centers, and connect the region's agricultural producers with multiple modal opportunities for export outside the region.

CCSCE projects a nearly 5 percent increase in agricultural jobs by 2035. Although this is a modest increase, ongoing productivity improvements promise much higher growth in economic impact from harvested crops. SACOG's Rural-Urban Connections Strategy (RUCS) project is focused on the industry's potential to expand even further, given that the region has some of the best soils available for producing a variety of crops. SACOG's research suggests that there is currently not an efficient means of moving agricultural commodities from the region's rural areas to the urban areas. Most small to mid-size farms in the region are not coordinated in delivering their produce to the urban areas. Individual deliveries increase fuel costs and time spent away from the farm. This problem is in part a distribu-

tion problem—the lack of a centralized distribution point in the urban areas—but is also due to the difficulties of getting larger trucks onto rural roads. Agricultural tourism sites (e.g. wineries) face their own difficulties around transportation, with increased traffic on rural roads, particularly during peak agricultural tourism season in the fall.

Working with stakeholders throughout the region, SACOG has identified promising opportunities to expand agriculture in the region through strategies such as: creation of a branded marketing campaign for farm products produced in the region to foster greater local demand; expansion of retail stores and restaurants featuring local foods; increased capacity to handle local foods within the existing consolidation and distribution systems; development of more local distribution, consolidation, and value-added facilities for food that is currently produced in the region but shipped out and returned in a processed form; and increasing local production of foods that are currently brought in from outside the region.[4]

Agriculture has unique needs for goods movement to local markets and distribution hubs. SACOG is continuing to study the implications of local food production and distribution systems for land supply and transportation needs; however, the general construct draws from an analogy to the Blueprint where a prime objective of bringing jobs and housing closer together is to reduce vehicle miles of travel. For food systems, the closer the producer is to the consumer, the fewer food miles of travel.

To support growth in this sector, transportation will need to be considered strategically for rural roads where transportation forecasts demand from agricultural-related workers and particularly heavier trucks and farm equipment. Heavy truck and equipment trips have greater impact on rural roads. However, as described in more detail in Chapter 10—Financial Stewardship, funding is an ongoing challenge for rural road maintenance, capacity and safety improvements to support projected agricultural activity in rural communities.

[4] www.sacog.org/rucs/wiki/index.php/Sacramento_Region_Local_Market_Assessment#Challenges_and_Opportunities

Goods Movement Issues

A number of the issues facing goods movement in the region, especially trucking, are described in the following section, suggesting the need for greater planning and coordination.

Truck Friction with Neighbors

Truck freight experiences conflicts with nearby residential areas, including:

- Truck/neighborhood conflicts, such as issues with truck volumes, noise and speed, and parking on major streets or arterials that front or abut residential areas.
- Issues with trucks driving onto sidewalks and into poles, signs and streetlights.
- Congestion issues: Trucks diverting onto arterials and rural roads to avoid congestion; trucks backing up traffic, especially on two-lane highways that act as rural main streets; heavily loaded trucks that accelerate slowly from signals or in congested traffic; and in some areas, truck volumes that can be a direct cause of congestion.
- Geometric limitations: Many truck operators are moving towards larger vehicles for the efficiency they provide; however, these larger vehicles often encounter problems while negotiating the region's roadways, including the space needed for turning and for parking while delivering products.
- Lack of permitted overnight parking facilities.

Lack of Private Sector Information

Despite a critical role in the region's economic vitality, goods movement is almost completely a function of the private sector. Most freight carriers prefer to operate in the background, largely invisible to the public. While a number of transportation users form some sort of constituency (e.g., bicycle and pedestrian advocates, transit riders), it is often noted that "freight doesn't vote." Concerns for increased patrolling for violations decrease the trucking industry's incentive to identify routes where vehicles are having problems with congestion, other vehicles, turning movements or lane departure issues.

The result of this is that the needs of the freight transportation industry are largely unknown to the public, planners and policy-makers, making it difficult to identify critical public sector investments to facilitate goods movement. Too often, planning agencies must tell their constituencies that no reliable data on trucking exist or that elaborate estimation and allocation methods must be employed. Freight flow data range from global estimates of total national ton-miles to truck counts on specific local streets. Freight movement forecasting methodologies in use are broad—ranging from

sophisticated models to back-of-the envelope guesses. Forecasting can estimate what is going on in the economy at large, and what goods move in and out of a particular site, yet does not currently provide much information about how and why goods are moved in between.

Pavement Deterioration

Increases in truck weight limits and greater use by trucks of local routes have contributed to swifter road deterioration. Heavy-truck traffic and wet weather are the two most critical factors in pavement deterioration. Since 1990, heavy-truck travel has increased significantly. As businesses have moved to suburban areas with limited highway access, more truck traffic has begun to use arterial roads; in Sacramento, trucks commonly use arterials due to the lack of cross-suburban freeways. Consolidation of processing plants has also meant that agricultural loads that would previously have traveled a short distance to a local facility now must be trucked much further, thereby increasing VMT, congestion, and wear and tear on rural roads.

Many local agencies have identified wear and tear damage from heavy trucks on arterial streets as a rising factor in poor pavement condition. Heavy trucks also do major damage to older rural county roads not built for these kinds of loads. Open roadway fractures due to delayed maintenance and increased or longer durations of wet periods allow water to enter the substructure of the roadway. When combined with heavy truck traffic, the negative effects are multiplied, and roadway surface damage expands.

Lack of Goods Movement Funds

Reliable funding sources for goods movement investments are severely limited in the SACOG region. Certain jurisdictions, whether for historical or location-specific reasons, have borne a disproportionate share of the goods movement burden for the region. It is a challenge both to ensure that strategic goods movement assets are protected, and that those jurisdictions bearing the burdens are afforded direct economic benefits.

The MTP/SCS contains significant funding for road maintenance and improvements. However, road and highway funds are generally distributed by miles of roadway or population, neither of which is completely consistent with impacts from goods movement. In essence, a locality with a higher share of industrial or distribution facilities and a correspondingly high volume of heavy truck traffic, would not automatically receive proportionate funds to repair the damage.

The conventional sources of funds for road maintenance and upgrades are gasoline excise taxes, sales taxes for transportation purposes, and development fees. None of these sources of funding is adequate to address the adverse financial impacts on cities and counties of road needs related to goods movement. Input from local economic development directors clearly indicates that the formula for development fees and valuation for property taxes tend to undervalue large distribution centers that generate heavy truck traffic. Large distribution centers typically do not generate enough civic revenue to pay for road maintenance or infrastructure upgrades necessitated by their operations, and the State of California no longer has an inventory tax to fund these types of improvements.

Industrial developers have opportunities to tap into state funds under several programs to spur economic development; however, none of these programs provide road funds to localities, and some involve reductions in local tax revenue, thus reducing the pool of funds needed to address goods movement impacts. A critical first step in generating the funds required to address such impacts would likely be a revision of the development fee formula to more accurately reflect long-term road needs related to goods movement.

A second option is regional or state funding to address local goods movement impacts. The most recent bond initiative for infrastructure generated a large sum of revenue; however, it has been used to deal with only the largest and most prominent projects statewide. Additional ongoing funding initiatives would be necessary to generate funds for a myriad of local needs. One positive development is that federal transportation reauthorization legislation, if and when it is passed by Congress, may include a dedicated goods movement fund for the first time.

Modal Efficiencies for Goods Movement

Each freight mode strives for efficient operations independent of public policies. There may, however, be instances where modal efficiencies can be encouraged or discouraged by public initiatives. Particularly, public policy may be able to influence the tradeoffs between efficiency and environmental impact.

Freight customers gravitate toward the most efficient mode that meets their needs. A Goods Movement Study completed by SACOG in 2007 established that modal shifts between rail, truck and ships offer limited but significant opportunities for increasing goods movement efficiency. For example, the report identified opportunities to reduce truck vehicle miles traveled by:

- Importing cement by ship through the Port of West Sacramento. Cement importers are constructing port terminals for that purpose, but success in reducing regional truck travel will depend on good highway access to and from the Port of West Sacramento, and channel deepening to accommodate modern vessels.
- Trans-loading inbound building materials at McClellan. Maximizing the benefit, however, may depend on good truck routes between McClellan and the various centers of demand as the construction industry rebounds.

Goods Movement and Land Use

Previous analysis by SACOG suggests that setting aside areas with appropriate zoning or other regulatory concessions to local distributors or similar goods movement businesses could also help minimize total truck travel in the long run, while freeing land capacity for compact, mixed-use development in the downtown Sacramento urban core**.** For example:

- Manufacturing and processing plants could probably locate outside the urban core without substantially increasing truck travel (and may do so on their own initiative).
- Many suppliers, distributors, and other businesses with a regional clientele prefer to be near the center of the region with good freeway access, but do not necessarily need high-cost center-city sites.
- Hub-and-spoke distribution and gathering networks such as FedEx may need local presence in a community or neighborhood, but could base delivery fleets at outlying locations.

Local goods distributors, however, require further investigation to determine their clientele and the consequences of moving them outside the urban core. One impact may be to put greater pressure on roadways back into the urban core as the effective distribution point; another may be to shift freeway trips from a few large trucks to several smaller trucks.

Findings from SACOG's Regional Goods Movement Study also suggest that the region should be selective in the goods movement and logistics functions it encourages. The report divides the goods movement and logistics industry into two segments:

- Those services required to support the needs of the Sacramento region's residents and businesses; and
- Additional functions that might be based in the region, but serve broader regional, state or national needs.

The first segment is a necessity. The availability of land for goods movement activities may be limited due to the nature of an industry's operations, land requirements, land use restrictions, and competition for higher value uses. There are compelling reasons to address these constraints in order to meet the growing demand for goods and services within the Sacramento region.

Beyond serving the region's own needs, consultants to SACOG's goods movement studies conclude there is limited potential for the region to become a large goods movement logistical center. Furthermore, there have been limited efforts by jurisdictions to allocate land and scarce public resources to encourage the development of additional large warehouses, distribution centers, and trans-loading facilities. A key factor is job density—how many jobs the proposed development creates per 10,000 square feet—as some of these facilities generate little local employment despite the size of their facilities.

Greater Regional Planning and Coordination

Goods movement routes in the region have been identified by SACOG to include: Surface Transportation Assistance Act (STAA) national highway networks approved for trucking; state and local terminal access (TA) routes, which are the portions of state or local highways where Caltrans or a local government has granted access to STAA trucks; routes identified in county general plans or other planning documents; and routes identified at outreach events for the RUCS project.

Identifying goods movement corridors can help focus improvements and maintenance activities on the roads most likely to be affected by heavy and frequent truck traffic. Individual communities may be able to divert or discourage trucks, but if regional needs as a whole are to be met, approaches to coexistence should be defined, such as through development of a coherent regional truck route system, to place as much emphasis on where trucks should be as on where they should not. The development of truck-specific routes will limit movements on local roads, while allowing goods to leave and reach their destinations though well-planned corridors.

Defining the regional goods movement network has distinct policy advantages that help support existing and future land uses, as projected in the MTP/SCS and current planning documents, by guiding development to minimize potential conflicts. Coordination along goods movement corridors with adjoining regional transportation planning agencies is already leading to the development of projects that will reduce and remove impediments to more effective truck routing. There is more than enough capacity for truck traffic in the region, as commercial vehicles typically make up about 16 percent of VMT. The MTP/SCS seeks to address growth in passenger traffic to help preserve adequate capacity for goods movement needs. An ongoing study of goods movement on the Highway 99 and Interstate 5 corridors will also update and inform future MTP/SCS.

Transportation Impacts on Employment and Business Vitality

Besides moving workers to work and goods to consumers, the transportation system has its own direct role in the economic vitality of the region.

First, transportation projects, such as roads and public transit, provide employment, both for construction and operations. The Political Economy Research Institute of the University of Massachusetts, Amherst (PERI) developed a model to estimate the employment effects of infrastructure spending.[5] Table 9.4 shows their estimates in 2009 for employment resulting from transportation-related infrastructure investments, including construction jobs (direct), jobs at suppliers of materials and equipment (indirect) and jobs resulting from workers spending their paychecks (induced):

Table 9.4
Employment Impacts per $1 Billion in Infrastructure Spending

Category	Direct and Indirect	Plus Induced
Transportation	13,829	18,930
Average Roads and Bridges	13,714	18,894
New Construction	12,638	17,472
Repair Work	14,790	20,317
Rail	9,932	14,747
Mass Transit	17,784	22,849
Aviation	14,002	19,266

Source: SACOG, September 2011.

A 2011 PERI study also found that for each $1 million spent there are 11.4 total jobs from bicycle-only infrastructure projects, 9.9 total jobs from pedestrian-only projects, and 7.8 jobs from road-only projects. Road projects that integrated major pedestrian and bicycle infrastructure resulted in an average 48 percent greater job creation than projects focused exclusively on roads for motor vehicles.[6]

Increased interest in bicycling and walking has had additional economic benefits. Recent reports demonstrate that bicycle and pedestrian improvements spark economic activity. Slowing down travel speeds and creating or upgrading walking and biking facilities not only improves conditions for existing businesses, but also is a proven method for revitalizing an area and attracting new development.[7] Services and businesses that cater to cyclists and pedestrians, such as stores selling bikes, walking shoes and related accessories, bicycle-themed restaurants, bike repair co-ops, and community events with bike valets have increased in popularity. Cycling-related events, such as the Bike Film Festival, Cyclefest, organized charity and recreational rides, the city of Davis' U.S. Bicycle Hall of Fame and California Bicycle Museum, and staging of a portion of the AmgenTour of California in Sacramento also bring money into the local economy.

As discussed in Chapter 3, SACOG and its partners received a HUD Sustainable Communities Regional Planning Grant. The grant provides funding for a limited number of studies to explore how the CEQA streamlining provisions of SB 375 can advance the readiness of Transit Priority Areas (TPAs) for transit-supportive residential and residential mixed-use development.

In June 2011, the SACOG Board selected as case studies for the region five Transit Priority Areas in four jurisdictions with the greatest likelihood of transit-oriented development (TOD) in the next 5–10 years. The five areas vary from suburban to urban settings near light rail, streetcar, or bus rapid transit stops, and represent a diversity of circumstances for regional learning. As a complement to the MTP/SCS EIR, SACOG will conduct environmental analysis in 2012 specifically for these areas, as well as develop action plans in conjunction with local communities.

This focus on jump-starting TOD in the region, along with other MTP/SCS land use and transportation changes, should support shorter, more local trips by various modes to work, shopping, recreation and services. This can help the region's economy by:

- Reducing household transportation costs that can free up family spending for other goods and services.
- Facilitating travel to education and training and increasing the preparation of the local workforce for new jobs as the economy recovers.
- Facilitating travel to reach medical care and increasing physical activity in the form of walking and biking, which can improve health and reduce health care costs due to lack of activity or treatment.
- Supporting transit, walking and biking trips to nearby restaurants, retailers, services, and entertainment venues. If these are locally owned or run, this keeps more money circulating in the local economy.
- Reducing construction costs to developers and/or increasing developable land through reduced parking requirements.
- Increasing residential and commercial property values and lease rates near quality transit.
- Improving quality of life, a major factor in business location decisions.

[5] http://www.peri.umass.edu/fileadmin/pdf/published_study/PERI_ABikes_October2011.pdf

[6] http://www.peri.umass.edu/236/hash/64a34bab6a183a2fc06fdc212875a3ad/publication/467/

[7] http://www.sacog.org/complete-streets/toolkit/files/docs/NCSC_CS%20Spark%20Economic%20Revitilization.pdf

Chapter 10

Financial Stewardship

Management of scarce funding resources to keep the existing transportation system serviceable and operating efficiently, while allowing for some system expansion

In a time of scarce resources, it is important that the SACOG region effectively manage and increase the productivity of the region's transportation system, and continue to improve the cost-effectiveness of its transportation investments.

The Sacramento region faces several key financial stewardship challenges in this MTP/SCS:

- how to fund the continuing need for road maintenance and rehabilitation;
- how to pay for transit operations and replacement of worn-out transit equipment; and
- how to make strategic operational improvements to gain more system efficiency and reduce the need for high-cost new capacity.

Chapter 4 includes a summary of all MTP/SCS transportation investments. This chapter discusses the challenges and strategies being used in the MTP/SCS to address funding constraints and make the most of the region's transportation system and investments.

Challenges to Reaching a State of Good Repair

The MTP/SCS faces an up-front challenge with funding limitations for two key elements in the plan: maintenance of local streets and roads, and funding for transit operations and replacement vehicles. Both of these issues are described in more detail in the following sections.

Funding Challenges for Road Maintenance

A critical financial stewardship challenge is providing adequate road maintenance and rehabilitation across the region. Sustainable communities cannot function without a well-maintained local street and road network.

Road maintenance is a statewide crisis. Since the 1980s, California has gained a reputation for poor quality roads—a startling reversal from the 1960s when California's road system was envied throughout the nation. According to the 2011 California Statewide Local Streets and Roads Needs Assessment[1], two-thirds of California's roads are currently in poor condition or at risk of falling into a poor condition, where more extensive repairs will be required to bring them back into a good state of repair. The study ranked road conditions using a pavement condition index (PCI) with categories ranging from 0-25 (failed condition) to 75-100 (good/ excellent condition).

In 2009, the Sacramento region's roads ranked on average in the high 60s or low 70s; in the 2011 Assessment, the region's average pavement condition index worsened to the low 60s. Roads with scores between 50 and 70 are considered at risk and require more costly repairs than typical routine preventative maintenance.

Without action, this situation will likely continue to degenerate with greater use of local roads by a growing population, more goods movement vehicle traffic, and increases in allowable truck weights. Rural roads that are used by farm equipment and heavily loaded trucks are particularly vulnerable to more rapid deterioration.

Truck traffic causes a disproportionate negative impact on road pavement. One fully loaded, multi-trailer, 80,000-pound truck causes as much pavement wear as 6,765 autos.[2] The volume of trucks using the transportation system is growing: heavy truck travel has been increasing at a significant rate since 1990.

Adequate road maintenance and rehabilitation is costly, but needs to be done on a regular schedule to prevent even higher costs. On average, reconstructing a road that has deteriorated to a poor condition can cost 20 times more

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[1] Nichols Consulting Engineers, Chtd. et al (2011) California Statewide Local Streets and Roads Needs Assessment. Retrieved from http://www.savecaliforniastreets.org

[2] FHWA Vehicle Classes with Definitions: Equivalent Single Axle Load

than preventative maintenance. Routine maintenance on a road generally costs between $20,000 and $40,000 per lane mile annually. Heavier maintenance such as overlays can cost anywhere from $100,000 to $200,000 per lane mile every seven to ten years. Full reconstructions can range anywhere from $400,000 to $700,000 per lane mile. Sidewalks and bike lanes can add to these costs. Reconstructing and rehabilitating sidewalks, curbs and gutters can add in excess of $500,000 per lane mile.[3] For example, the City of Sacramento alone estimates that it would require $15 million annually to address the road maintenance needs of the city's more than 3,000 lane miles of paved roadways. This amount does not even begin to cover the city's backlog of major repairs, which have been put on hold because of a lack of funding. Currently, the city estimates that it spends $3-5 million annually on road maintenance, leaving more than a $10 million dollar shortfall per year.

In the SACOG region, cities and counties are responsible for keeping the street and road system in a state of good repair through regular maintenance activities. Between 2000 and 2008, local governments in the SACOG region spent approximately $2.1 billion on maintenance and reconstruction of the region's thousands of miles of city and county roads. The level of investment in maintenance and reconstruction in the region fluctuates from year to year, but has grown at an average rate of 10 percent per year since 2000. Routine maintenance accounts for about 60 percent of these expenditures, with the remaining 40 percent going toward major reconstruction projects. In 2008, the latest year for which data are available, local government expenditures were more than $190 million for routine maintenance and $135 million for reconstruction ($325 million combined).[4]

Deferred maintenance problems vary widely across the region and funding formulas place some jurisdictions at a disadvantage. The real cost of deferred maintenance is elusive, as local agencies report it in different ways and damage initially occurs out of sight beneath the surface pavement. It affects jurisdictions unevenly, depending on such factors as age and design of roads and truck traffic volumes. Older, built-out cities such as Sacramento, Citrus Heights, and Marysville, with older roads built to past standards and years of deferred road maintenance, face continuing major rehabilitation costs. Rural counties end up as losers in funding formulas for deferred maintenance, but many depend on resource-based economies such as agriculture, logging, or mining that wear on old narrow roads with heavy trucks. Newer developing cities such as Elk Grove, Folsom, and Lincoln benefit from modern developer-built road mileage that makes them eligible under road funding formulas without yet adding major rehabilitation liabilities. However, such cities will need to attend to an increasing load of preventive maintenance to stay ahead of the curve.

In addition, cities often must deal with extra costs due to utilities in the roadbed, pavement damage from past utility work, and landscaping in the right-of-way. Counties must consider adding paved shoulders to rural roads.

Addressing Road Maintenance/Rehabilitation Funding in the MTP/SCS

The MTP/SCS prioritizes preservation of the existing transportation system when making investment decisions with revenues that can be used for maintenance and rehabilitation purposes. Generally, federal and state money is not available to assist with routine maintenance; however, as roads deteriorate and require more extensive reconstruction, SACOG taps federal and state funds to help local governments bring roads back to a good state of repair. Since 1998, the region has diverted approximately 15 percent of state and federal funds to road rehabilitation instead of road improvements. The MTP/SCS includes $11.5 billion ($16.4 billion YOE) for road maintenance and rehabilitation, and calls for additional revenue equivalent to what would be raised by a new 1/2-cent sales tax in Sacramento County to help pay for additional road maintenance and transit operations. MTP policies and strategies reinforce this priority for addressing chronic road maintenance issues and tradeoffs between road maintenance and road improvements or expansions.

Unfortunately, resources for road maintenance do not keep pace with escalating costs and there continues to be a shortfall for road maintenance and rehabilitation. Despite existing and planned investment, the region's roads continue to deteriorate. Preventive maintenance is important for controlling long-term costs, but the only local funds available for maintenance are local shares of the gas tax, sales tax funds, and local general funds. Maintenance and rehabilitation consume about 70 percent of the typical local road budget today, leaving 30 percent for any local improvements and new construction.

SACOG estimates that an additional $110 million annually over the course of the MTP/SCS plan period would be needed to raise the region's average Pavement Condition Index (PCI) for local roads and bicycle/pedestrian facilities from the at-risk range to the good/excellent condition range. A more detailed discussion of this underfunded need is provided in Appendix B-1.

In addition, funding constraints for road maintenance and rehabilitation can also mean missed opportunities in the region for developing more complete streets. When major repairs are undertaken on public right-of-way, the facility must at a minimum be brought up to federal ADA standards

[3] Nichols Consulting Engineers, Chtd. et al (2011) California Statewide Local Streets and Roads Needs Assessment. Accessed from http://www.savecaliforniastreets.org

[4] 2008 State Controller's Report data

through improvements that include curb ramps at intersections and access improvements on public walkways. Because ADA improvements can be costly, opportunities for other improvements to facilitate pedestrian as well as bicycle travel are sometimes missed, due to limited maintenance/rehabilitation funds. These opportunities include bike lane striping and improved signage that is best to do as part of a more comprehensive rehabilitation project rather than as a retrofit between rehabilitation cycles. Other opportunities that are often missed are road diets, roundabouts, lighting, sidewalk bulb-outs and pedestrian refuge islands at intersections, which require more funding.

Funding Challenges for Transit Operations

Transit services play a vitally important role in realizing the MTP/SCS forecasted land use and transportation pattern. The Sacramento region faces a significant challenge in securing adequate funding to continue existing services plus expand transit coverage and frequency across the region over the plan period.

Operating public transit systems requires a significant financial commitment. In 2008, the 14 transit services in the region needed about $230 million to operate fixed route and dial-a-ride services. These operating costs include drivers, mechanics, dispatching, fuel, parts, supplies, services, and administration. On average, 75 percent of operating costs are for labor.[5] Over the last five years, the region's expenditures for transit capital—including new and replacement vehicles, stations and other facilities—averaged another $60 million annually.

Sacramento Regional Transit District (RT), which carries about 80 percent of the region's transit trips, accounted for about 70 percent of regional operating costs in 2008.[6] For every trip on bus and light rail that RT provided in 2008, fares covered about $0.91 of the cost of that trip, requiring $4.06 and $2.44 in public funding to supplement bus and light rail operations, respectively.[7] Some of the smaller transit operators can operate buses for less due to non-union labor contracts, but their costs are increasing as well.

With the decline in transit funding in recent years, a number of the region's transit operators have had to cut fixed-route transit services. For example, Roseville Transit and all of Sacramento County's operators cut fixed-route service in 2009 or 2010. Even when transit funding was more available, fixed-route bus service was not offered uniformly in terms of hours and frequency of service throughout the region. Given smaller populations and fewer resources, the region's suburban and rural operators tend to offer more limited service than in the more urbanized areas, especially on evenings, weekends and to the most rural locations.

Over the course of the MTP planning period, significantly higher levels of funding for transit operations are needed for the region to meet its goals for a robust transit system. Maintaining current levels of transit service, restoring previous routes, frequencies or hours, and expanding operations in the future are primarily constrained by limited dedicated revenues for transit operations. Transit providers in the region have few opportunities to capture new revenues for operations and maintenance costs, and often use flexible funds that could otherwise be utilized for capital expansion to help support operational costs.

Fare increases can help cover this gap, but increases need to be sensitive to the ability of transit-dependent persons to pay. Balancing the need to raise revenue and meet state requirements for fares to cover a certain proportion of operating costs (the farebox recovery rate), with the ability of transit-dependent riders to pay for service supports good policy decisions for expanding services in the region. In the SACOG region, the regional average for farebox recovery was 24 percent in 2009. Smaller rural and suburban operators typically fall below this level, while a number of the larger operators in the region now cover 26-28 percent or more of operating costs with fare revenue.

Transit fares vary widely in the SACOG region, with discounts usually offered for seniors, youth and persons with disabilities, which reduces total fare revenue. Transit operators in Sacramento County have the highest fares in the region, from $2.25 to $2.50 per single adult ride, which can pose a barrier to transit use by the county's many low-income residents.

There is a chicken-and-egg quality to transit service. More ridership usually results in increased fares to cover operating costs, so higher ridership becomes a critical part of the service expansion equation. Higher fare revenue depends on increasing both fare-paying transit-dependent riders and choice riders. However, service must be significantly better to attract more choice riders, and better service initially requires more public funding.

Limited state and federal funding places a higher emphasis on local sources. Over time, the methods of paying for transit operations have changed and funding sources have shrunk. Increasingly, Congress and the State Legislature have restricted the use of federal and state funds for transit operations (with the exception of vehicle preventative maintenance), on the principle that transit is a local responsibility. Prior to Proposition 13 in 1978, local general funds used to cover more than one-third of transit operating costs in the large urban areas, but that source has also largely dried up due to competing priorities for reduced general fund revenues.

As federal and state funding support for transit operations declined, transit operators have been increasingly dependent on more volatile sources of funds that have been most affected by the sagging economy. A significant

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[5] 2008 State Controller's Report data for 14 regional transit operators

[6] Ibid.

[7] 2008 NTD data summary for Sacramento Regional Transit District

percentage of total operating revenues for the region's operators now come from two volatile sales taxes sources:

- Transportation Development Act (TDA)/Local Transportation Funds (LTF) from a ¼-cent sales tax for transportation authorized by the state TDA;
- Sacramento County's Measure A, a ½-cent county transportation sales tax.

With sales tax receipts declining due to the economic downturn, both of these sources have yielded significantly less revenue for transit agencies in the last few years. Receipts only began a turnaround in September 2010 and as of September 2011 were still 10 to 15 percent lower than 2008 levels across the region. In addition to broader economic challenges, some of the jurisdictions where public works departments use remaining TDA/LTF funds for road maintenance frequently experience resistance to drawing a larger share of TDA/LTF funds for transit operations.

Funding Challenges for Transit Capital

Although not as underfunded as operating needs, transit capital needs in the MTP/SCS exceed available revenues in the plan:

- The region's current fleet of nearly 400 transit buses, with a 14-year assumed service life, will need to be replaced twice over the next 25 years at an estimated cost of $450,000 per bus, totaling more than $460 million. This number does not include expansion buses and spare buses that will need to be purchased in addition to replacing existing vehicles.
- Replacement of existing vehicles will be partially offset by RT's current reserve and spare vehicles. Historically RT has run with about 15 percent spare buses in its fleet. However, because of recent service cuts, RT's spare rate has increased and will hover around 30-40 percent until transit service is restored. This increased spare rate will allow RT to operate existing and near-term service with fewer new and replacement bus purchases; however, as transit service is fully restored later in the plan period, the spare rate will return to historical rates, at which time the need for replacement and expansion buses will resume.
- The region's existing fleet of roughly 200 paratransit small buses, with a 5-year lifecycle, will need to be replaced 5 times over the next 25 years, at $75,000 per small bus, totaling $100 million.
- RT's entire light rail fleet, now at 97 vehicles, will need to be replaced once during the next 25 years. This represents a significant financial burden, as each light rail vehicle costs approximately $4 million ($388 million total).
- In addition, new state clean air rules will require many suburban operators to convert fleets from diesel fuels to clean fuels in upcoming years, making buses costlier, posing new fueling arrangements, and perhaps requiring earlier retirement of older diesel coaches.

Beyond replacing the vehicles necessary to operate the existing transit system, the expanded level of transit service included in the MTP/SCS requires a doubling of the fixed route bus fleet, more than 50 new bus rapid transit coaches, 10 additional express buses, 250 demand-response/shuttle small buses, and more than 60 new streetcar and light rail vehicles by 2035 to serve the new land use pattern with higher quality transit service. Appendix B-1 provides more detail on transit capital and operating revenues and assumptions.

Addressing Transit Funding in the MTP/SCS

An outcome of the poor fiscal climate is a plan with limited growth in transit services for the first ten years due to revenue constraints, but with more robust growth in later years. By 2020, transit operations expenditures will be only slightly higher than in the 2008 base year. The most significant transit investments will occur in the 2020–2035 time period, when revenues are projected to increase and more transit-supportive compact and mixed land uses are present to support higher ridership. By 2035, the MTP/SCS calls for approximately $435 million in operations to provide nearly 8,062 daily vehicle service hours—or nearly double the 2008 level of service—for all modes of transit: fixed-route bus, light rail, streetcar, shuttle, bus rapid transit/express bus, and dial-a-ride.

Increased operational efficiencies are a key aspect of the MTP/SCS in addressing the transit operations funding challenge. In the MTP/SCS, existing transit services are assumed to continue while new transit investments focus on the corridors with more compact and mixed land uses that are most capable of supporting robust transit service. Providing high-frequency service of 15 minutes or better in areas with adequate land use densities allows the MTP/SCS to increase transit productivity by 27 percent over the previous MTP. Model results project that this higher-quality, 15-minute service in centers and corridors attracts higher ridership across the region. The increased productivity of transit services results in fares covering a significantly higher proportion of operating costs, rising from 24 percent of operating costs in 2009 to 38 percent of operating costs ($2.3 billion) by 2035. The significant increase in productivity is intrinsically linked to the changing land use pattern: where centers and corridors support increased housing and employment growth, they bring potential transit riders closer to transit service to the benefit of the traveler and the transit system.

Already, the region's transit operators are approaching service restoration and expansion plans with an eye to prioritizing productive routes. Many of the transit operators in the region have seen significant improvements in their fare box recovery rates and average riders per vehicle over the

last few years and are analyzing approaches to continuing this progress. One of the significant efforts underway is RT's Comprehensive Operational Analysis to plan service restorations over the coming years in order to reflect a greater emphasis on corridors with transit-supportive land uses.

Even with increased productivity, an increase in transit revenues over time is essential for the MTP/SCS to realize the plan's performance outcomes. In terms of transit operations funding, the MTP/SCS assumes a continuing heavy reliance on sales taxes (40 percent of revenues), but anticipates funding levels will experience modest inflation-adjusted growth over the planning period due to overall population growth and a future Measure B half-cent transportation sales tax equivalent in Sacramento County beginning in 2014, with half of the revenue going to supporting transit operational and capital needs.

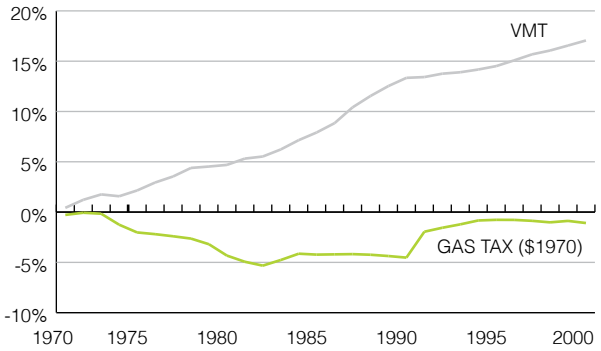
In order to partially offset the projected decline in the growth of dedicated transit revenues since the 2008 MTP was completed, the MTP/SCS also assumes a shift of more than $2 billion of flexible revenue from road to transit purposes over the course of the planning period. This increase is primarily a result of local agency development fee programs redirecting a share of these fees from road to transit purposes. Most of this transfer supports transit vehicle purchases and infrastructure in the post-2020 period of the plan.

Need for Greater System Efficiency and Productivity

The existing transportation system in the SACOG region is the result of decades of major investments. Therefore, it is critical to make the best possible use of this valuable infrastructure. With transportation revenues increasingly limited, the MTP/SCS prioritizes investments that maintain, preserve, and make more efficient use of existing road and transit assets to help defer or even eliminate the need for some road capacity expansions.

Figure 10.1 shows the change in vehicle miles traveled (VMT) versus gas tax revenues from 1970-2000. With gas tax funding significantly reduced, sales taxes and development-based fees are becoming the main sources of road expansion funds—but these sources have been declining in recent years and are not projected to return to the growth of previous years.

Figure 10.1
Change in VMT vs. Gas Tax Revenue



Source: SACOG, September 2011.

Road programs are so significantly underfunded today that funding for road expansion must compete with funding for road maintenance, rehabilitation, and operations. The cycle typically unfolds as follows: Some road maintenance must be deferred; the road deteriorates to the point it must be reconstructed, which costs more but becomes eligible to use capital funds; so capital funds are siphoned off for road repair.

Caltrans is also starved for transportation revenue. The agency actively pursues developer funding for state highway improvements, since it can use only 40 percent of its 25 percent share of STIP funding for state highways in urban areas. The challenge this presents will likely continue into the years ahead now that the state uses 100 percent of its shares of gas taxes and federal funds for highway maintenance and rehabilitation.

Because simply building more and more new transportation infrastructure is neither feasible nor practical due to funding limits for the foreseeable future, the MTP/SCS

combines strategies to increase the productivity of the transportation system and shift demand with strategic operational and capacity improvements. As described in more detail in Chapter 4, the MTP/SCS prioritizes road maintenance and rehabilitation and transit services while reducing future road capacity expenditures by more than 30 percent from the 2008 MTP.

The MTP/SCS takes a strategic approach to capacity projects: some are prioritized because they help improve system efficiency; some are downsized and right-sized as described in Chapter 5B; some are pushed to project development because it is uncertain they can be funded and built during the plan period; while some were eliminated for higher priorities. Strategic road capacity projects in the MTP/SCS are now of three primary types:

- projects that address major existing bottleneck locations through operational improvements and targeted auxiliary lanes to reduce severe congestion points;
- reduced and/or reconfigured projects with multi-modal focus that replace larger capacity projects; and
- new roadway facilities that are more closely tied to the land use and growth pattern assumed in the MTP/SCS.

This emphasis on lower-cost operational improvements and right-sizing of roadway expansion projects is an important component of an MTP/SCS that achieves strong performance benefits with lower funding levels. One outcome of the plan investments is an increase in the percentage of VMT that uses the roadway network at optimal levels. Transit investments in later plan years increase the productivity of the transit system, doubling service hours, tripling ridership, quadrupling boardings, and increasing the farebox recovery rate from 24 percent of operating costs to 38 percent ($2.3 billion).

As discussed in previous chapters, the MTP/SCS land use pattern forecasts an increase in areas with more jobs, housing choices and mix of land uses, while transportation investments broaden mobility options through supporting improved transit, bicycling and walking opportunities. More compact and mixed land uses make traveling by transit and non-motorized modes easier. The ongoing development of the high-occupancy vehicle (HOV) lane network on area freeways is an enhancement for not only carpools, but also vanpools and express buses. Increased development density provides carpoolers and vanpoolers a larger pool of potential partners to match with in closer proximity of home and work. Transit is better positioned to serve commute trips because it is more cost-effective when it operates in environments with more people—whether residents or employees—while shorter distances to reach daily needs encourage more walking or biking.

Chapters 5B and 5C explains in more detail how the MTP/SCS balance of investments results in good performance, mode share shifts, and increased roadway and transit system productivity. Other strategically targeted investments in the MTP/SCS, such as transportation demand management, technology deployment, goods movement and safety improvements can also help improve system efficiency at lower cost than capacity expansion. These strategies are described below, except goods movement planning efforts, which are discussed in Chapter 9 on Economic Vitality.

Transportation Demand Management (TDM)

Transportation Demand Management (TDM) programs work to match people with alternatives to driving alone. TDM is the collective term for programs geared to reducing the amount of solo driving and its growth in order to enhance the operation of the transportation network, and avoid, downsize or delay costly transportation infrastructure investments. TDM is an ongoing SACOG program. TDM strategies promote carpooling and vanpooling, transit use, bicycling, walking, flexible work schedules, and telecommuting, as well as other programs that reduce VMT. Transportation demand management programs can take traffic off the road at peak hours for very little direct cost. Factors that spur some travelers to shift their travel mode from driving alone include the following:

- sitting in congestion, which adds delay, annoyance, and opportunity cost on top of the individual's cost of driving;
- increasing fuel costs;
- high parking costs and/or low availability of parking at work;
- reduced costs or subsidies, competitive travel time and/or greater predictability of carpooling, transit, walking, or bicycling compared with driving;
- increased awareness of the health benefits of bicycling and walking for reducing risks from obesity/overweight, diabetes, heart disease, and other conditions;
- interest in contributing to reductions in greenhouse gas emissions and improving air quality;
- increased availability of vanpools and ride-shares that can serve employees with non-traditional work hours; and
- the ability to telecommute or work from home on some or all workdays.

TDM projects aim to increase the appeal of more efficient routes and alternate modes of transportation. Many TDM projects involve implementing and operating systems that provide travelers with real-time information for planning trips by telephone or the internet. Other programs are designed to give people incentives to use public transit, sometimes focusing on specific groups of people and other times promoting public transit for everyone when air quality is poor. Programs that organize or subsidize alternative travel options, such as ridesharing, vanpooling, or telecommuting also fall in this category.

SACOG's 511 regional travel information program is a prime example of a TDM strategy. SACOG's 511 and rideshare programs cost less than $2 million per year region-wide to support carpooling, transit ridership, and bicycling in all corridors and areas. Travelers may call the 511 telephone number or visit the website to obtain real-time traffic updates and direct feeds from traffic cameras and changeable message signs, as well as local and regional transit and intercity rail information. The website and phone system allow people to offer or locate shared-ride carpools or vanpools. SACOG's 511 website also has tools for cyclists, including those for planning a bike trip or making your business more bicycle-friendly.

Most TDM strategies are partially funded through employers, and therefore, focus on work trips. TDM can be an effective instrument for broadening commute options and reducing the biggest congestion problem—peak period vehicle trips. The alternative travel modes promoted by TDM generally target employees with traditional work schedules; however, the benefits of TDM are not limited to employees working regular schedules.

Local Transportation Management Organizations and Associations (TMOs and TMAs) and other outreach partners coordinate TDM programs with local employers and employees, providing valuable public outreach and commute assistance. Largely, the region is divided geographically among 13 TDM outreach partners including:

- 50 Corridor TMA
- City of Elk Grove
- City of Roseville
- El Dorado County Transportation Commission
- McClellan Park TMA
- North Natomas TMA
- Placer County Transportation Planning Agency
- Point West Area TMA
- Power Inn Alliance
- Sacramento TMA
- South Natomas TMA
- Yolo TMA
- Yuba-Sutter TMA

A single set of TDM strategies is not universally applicable region-wide. Without the appropriate transportation infrastructure—public transit, HOV, bicycling, and walking facilities—and public outreach, TDM strategies are not as effective. The MTP/SCS therefore includes support for land uses, transportation options, and TDM education and assistance programs that support shifts in mode use.

A 2005 Cleaner Air Partnership survey showed that workers in downtown Sacramento are the least likely to drive alone. A major reason is because parking downtown is difficult to find and the cost is high. Worksite parking, free and readily available everywhere except downtown Sacramento, is a major factor in commute choices; however, the idea of pricing of workplace parking is not widely popular. The result of limited mobility options is that workers in outlying employment centers (most of which offer free parking) are most likely to drive alone.

TDM programs are low-cost in comparison to capital improvements. If these programs can cause even a small percentage of trips to be shifted out of cars and into alternative modes, it can lead to a noticeable difference

in the operation of the transportation system. Additionally, TDM capitalizes on investments already made in public transportation facilities and services (transit, bike facilities, sidewalks, and HOV lanes) by educating users about their travel options, and coordinating trips between users with similar trip patterns.

The goal of the TDM program is to help contribute to the 10 percent reduction in trips anticipated in the MTP/SCS. While much of this trip reduction will be due to the changes in land use identified in the MTP/SCS, TDM will also play an important role in support and encouragement for alternative mode choices in the region. Table 10.1 compares sample TDM programs in 2008 with planned TDM program expansions by 2035.

Table 10.1
Transportation Demand Management (TDM) in the MTP/SCS

Policy or Program	2008	MTP/SCS (by 2035)
Transportation Management Agencies	About one dozen functioning TMAs in employment centers—focus on education, outreach & coordination	Regional coverage expands, with some TMAs offering direct incentive-program administration, plus management of support programs
Work-Based Incentives	Spotty transit, HOV & non-motorized work incentives; emphasis on public agencies	Additional funding support for work-based programs in order to reach a higher share of regional employers
Vanpool Support	Limited support on an employer-by-employer basis	Sizeable vanpool programs at about 10 major employment centers
Car-Sharing Programs	One market-based car share in downtown Sacramento	Additional market-based car shares in multiple job centers

Transportation System Management (TSM)

As a complement to the TDM strategies described in the previous section, operational investments in the existing system are a priority of the MTP/SCS in order to achieve efficiencies and minimize more costly capacity expansion investments. Key operational improvements in the MTP/SCS include Transportation System Management (TSM) investment areas summarized in Table 10.2.

Table 10.2
Transportation System Management Summary

Policy or Program	2011	MTP/SCS 2035
Ramp Metering	Meters in peak periods and directions at +/-50 locations	Expand to 200+ locations
Variable Message Signs	Signs at < 10 locations	Signs at 30+ locations
Incident Management	Loops, closed circuit TV (CCTV), service patrol, on freeways	Detection on more roadways; more service patrols
Integrated Corridor Management	n/a	Greater integration, coordination on freeway + LRT corridors
Arterial Management	Initial closed loop/adaptive control deployment	Some major arterials; river crossings and approaches
Traveler Information & Fare Media	Regional 511+website	Expanded 511 and website that offers real-time traffic and next bus information; regional transit fare card
Safer County Roads, Highways & Freeways	Incomplete network of shoulders; demonstration projects with limited deployment of the 2035 features	Expanded network of shoulders; improved freeway recovery zones; passing lanes; guardrails; advanced pavement materials and reflectors for safety; increased lighting and signage at intersections or interchanges
Safer Local Streets & Roads	limited complete streets applications; corridors with ADA features	Complete streets features; ADA system retrofits; roundabouts; improved lighting and signage at intersections

In addition to strategies described above, investments can be made in the near term to help reduce the need for more costly investments in the long term. The following sections offer expanded discussions of both intelligent transportation systems and Safety investments in the MTP/SCS:

Intelligent Transportation Systems (ITS)

ITS offers a cost-effective system management strategy to improve traffic flow, transit operations, incident management, emergency response, and traveler information for all travel modes. Corridors targeted for reinvestment in the region can use ITS to handle increases in traffic, and support and encourage transit, pedestrian and bicycle mobility as envisioned in the Blueprint and MTP/SCS, sometimes at less than a quarter of the cost of adding new lanes. ITS features, particularly the timing of signals, can optimize capacity on existing roadways to reduce travel time delay and add 10 to 20 percent to road capacity at a modest cost.

A projected 20 percent of the MTP's $2.4 billion for programs and planning will help support implementation of ITS improvements across the region. Supported features include:

- upgrading and coordination of traffic signals to promote a smoother flow of traffic;
- roadway cameras;
- automated highway message signs;
- crosswalk signals with pedestrian countdown timers;
- real-time train or bus arrival time message signs (such as seen at RT light rail stations);
- prepaid transit fare machines; and
- traffic signal preemption for emergency and limited-stop transit vehicles to improve emergency response times and the on-time performance of public transit.

Federal planning regulations require states and metropolitan regions to define in greater detail and seek to fund a logical system of integrated ITS projects. SACOG plays a coordinating role in this function so that ITS investments of various agencies can work together. SACOG is currently deploying a communications system called STARNET that enables various emergency response and traffic

operations centers to work together more easily.

The STARNET vision includes the development of Smart Corridors, such as Sunrise and Hazel Avenues in Sacramento County, where ITS investments are planned by local agencies and transit districts. These smart corridors include transit-specific enhancements such as transit signal preemption, queue jumping, and other bus rapid transit features, to offer transit a time advantage without the high cost to add a dedicated transit lane.

Currently, all of the identified ITS categories in Table 10.2, except integrated corridor management, are deployed to at least a limited degree in the SACOG region today. In support of ITS, Caltrans District 3 has established a transportation management center (TMC), as have several larger cities and counties. Additionally, Caltrans and local agencies have deployed field monitoring (loops, closed circuit TV) and controls (meters & signals under TMC control). STARNET, which is a communications and data integration effort among the TMCs, has been established. Funding through the MTP/SCS will support significant expansion of the field monitoring and control equipment, as well as expansion of STARNET. Through its Corridor System Management Programs, Caltrans and its local agency partners have begun planning for corridor management on major freeway corridors.

Smart fare media, a form of ITS, improves fare collection and ease of payment for people who use public transit. Connect Card is a regional transit fare media system underway that will allow transit users to transfer seamlessly across multiple transit operators and routes. Connect Card is a partnership between SACOG and most transit operators in the region, expected to be fully operational by 2013.

Road, Bike and Pedestrian Safety

The *Safe, Accountable, Flexible, Efficient Transportation Equity Act for the 21st Century* (SAFETEA-LU) requires that Metropolitan Planning Organizations (MPOs) have a safety element in their long-range transportation plans to increase the safety and security of the transportation system for motorized and non-motorized users. There are many aspects of the MTP/SCS that identify and allocate resources to improve the safety of the region's transportation system as a means both to reduce risk for the region's residents and to improve system efficiency.

Up to 50 percent of traffic congestion on freeways is not caused by a lack of capacity, but is due to incidents including collisions, weather, spilled loads, and stalled vehicles. Incidents on highways and freeways are both a safety issue and a significant cause of congestion. Although crashes are typically less severe on congested roadways, even a small incident can quickly lead to a large amount of traffic delay.

Highway and road safety is an issue in both urban and rural areas of the region. Key safety challenges along urban highways include narrow shoulders; roadside obstacles; short, tight ramps; and poor lighting and signage along older sections of urban freeways and highways. In rural areas, shoulders and guardrails are lacking along many high-collision locations. Safety concerns for local roads largely center on intersection crashes and run-off-the-road collisions.

The solutions to increasing the safety of rural roads must be sensitive to community preferences and values of rural areas that are often much different from those in urbanized areas. Many residents in the rural portions of the region actually prefer roadways that reflect a more rural setting, that is, without curbs, gutters, and sidewalks. Finding a balance between preserving rural character and providing adequate non-motorized infrastructure is essential in keeping our region's rural roadways safe.

issues in the region involve multiple modes of travel. However, data reporting is limited and planning efforts have only recently been increasing. Public agencies avoid identifying safety hazards to reduce lawsuit risk, which hampers safety programs. The 2006 approval of California's Strategic Highway Safety Implementation Plan (SHSIP) was an important step in guiding Caltrans' implementation of strategies statewide. Local studies and the SHSIP reveal that safety gaps are still significant for bicyclists and pedestrians. Efficient roadway designs for vehicles often work to the disadvantage of those on foot or bike, especially at freeway interchanges and arterials with timed signals and shortened walk times. Improving interchange and intersection safety for all roadway users continues to be a significant area of safety need, along with greater protections at rail intersections and at-grade crossings.

Improving roadway safety and preventing collisions can lead to increasing transportation system efficiency and reduced collision-related costs. The real contributing factors in crashes are often unclear, and it is hard to devise safety projects that will improve driver behavior. However, unforgiving local roadway conditions can turn a simple crash into a fatality or severe injury, with safety-related costs high for fatalities, injuries, congestion, lost work time, and higher insurance premiums.

Transportation Safety in the MTP/SCS

There are significant investments in the MTP/SCS for safety and management strategies that create better driving conditions, provide improved facilities for bicyclists and pedestrians, and reduce or prevent collisions and safety-related impacts. While there is no general expenditure category for safety projects, the MTP/SCS includes over $1 billion in investments directed toward projects that directly identify improved safety as a primary goal.

Common safety and management projects enhance freeways and local roads with technology that monitors and adjusts the flow of traffic. A goal of these programs is to help clear roadways of hazards. Through improving the response time in dealing with roadway incidents—and ideally avoiding them altogether—there can be immediate progress in increasing safety and reducing roadway congestion to improve system efficiency. Incident management strategies can work on faster identification, quicker response and cleanup, and redirection of motorists to avoid the incident scene. Examples include freeway service patrols that quickly restore freeway lanes to traffic, implementation of ITS investments described earlier to monitor and track incidents, and enhanced 511 phone and Internet traveler information so drivers and transit riders can make travel choices based on real-time information.

MTP/SCS expenditures for safety projects, maintenance and rehabilitation, road capital and operations projects, and bicycle and pedestrian facilities all support safety improvements in the region's transportation system. Some examples of specific safety-related projects included in the MTP/SCS are listed below.

- Collision prevention and reduction projects: Projects to add medians, guardrails, passing lanes, flashing beacons, lighting, and to eliminate other significant hazards in the plan total $750 million, including:
  - Passing lanes from Marysville to the Butte County Line
  - Upgrading the metal beam guardrail at various locations across the region
  - Programs such as Safe Routes to Schools, which focus on identifying transportation projects that would improve safety for school children traveling to and from school sites.
- Improvements within existing right-of-way: Projects including realignment, turn lanes, improving safety at intersections, rail crossing improvements, and replacing structurally deficient bridges total $187 million, including:
  - Addition of turn lanes at Covell Blvd./Hwy. 113 that includes access-egress to Hwy. 113 ($15 million)
  - Joint Placer County and City of Lincoln safety project for a bridge replacement and two-lane roadway with shoulders from the Lincoln Bypass to Nicholas Road ($6 million)
- Expanded and new facilities: Projects that widen roadways and shoulders, including the addition of bike lanes and ADA improvements, and the installation of traffic signals that are part of larger projects, total $1.75 billion, including:
  - Installation of traffic signals and sidewalks at Sunrise Blvd. and Sungarden Drive ($1.1 million)
  - Main Street realignment in Placerville, including the addition of new sidewalks ($8.1 million)

Caltrans maintains a list of unprotected highway and rail intersections. SAFETEA-LU funded a new Safety Program beginning in 2007 for such neglected needs as safer rail grade crossings and urban interchanges.

Observed Data and Historic Trends in Transportation Safety

Measuring the impact of transportation safety planning and investments is difficult in regional transportation plans. Mature, well-vetted analysis tools such as travel demand models or emissions models do not exist for evaluating the effects of long-range transportation plan policies and investments on safety. In response to this challenge, the Transportation Research Board, through the National Cooperative Highway Research Program, has funded the development of a first-of-its kind tool for projecting collision rates at the regional level. This tool, PlanSafe, was utilized to evaluate the MTP/SCS. The results show a 3 percent reduction in the collision rate, related primarily to the reduction in VMT per capita documented in Chapter 5.

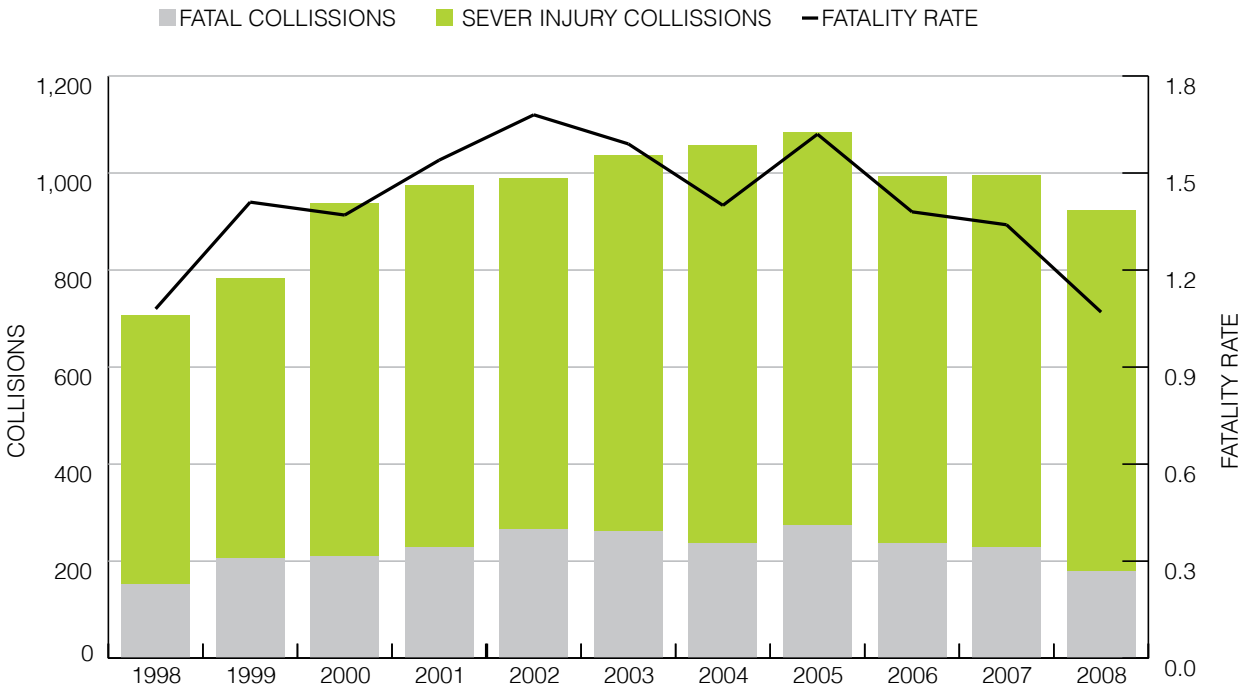
One measure of transportation system safety is the number and rate of collisions that occur on roadways. In California as a whole:

- Nearly 40 percent of fatalities occur in rural areas. A number of factors contribute to a higher fatality rate including higher speed crashes, more alcohol-related crashes, and longer emergency medical services response times.
- Pedestrian fatalities as a portion of total fatalities are much higher than the nation's 12 percent, exceeding 18 percent of total fatalities in the state. The NHTSA publication, Designing for Pedestrian Safety, notes that crashes involving pedestrians have the highest crash risk of fatalities.
- In raw numbers, bicyclist fatalities accounted for 3.2 percent of the state's total traffic fatalities.

Roadway fatalities in the SACOG region have actually been decreasing. Figure 10.2 provides the total number of fatal and injury collisions in the six SACOG counties, and a calculated fatality rate, for the years 1998 to 2008.

- The total number of fatal and severe injury collisions peaked in 2005 at 1,084. Since 2005, the absolute number of fatal and severe injury collisions has declined, to 924 in 2008.
- The fatality rate (the number of fatalities per 100 million vehicle miles traveled) has declined from 2005, from 1.62 to 1.07 in 2008. This decline mirrors similar trends for California as a whole.
- In 2009, there were 173 total fatalities, compared to 180 in 2008 and 223 in 2007. This downward trend is reflected nationally and can be attributed to a number of factors including safer vehicles, higher rates of seatbelt use, and stricter enforcement of drunk and distracted driving laws, among others.
- Trucks were involved in 7 percent of fatal collisions (13 total collisions) in the region. Heavy-truck crashes, especially those involving other vehicles, are more likely to result in death or serious injuries.
- Eight cyclists were killed in traffic collisions and 798 were injured, accounting for 4.2 percent of total fatalities and 5 percent of total injuries in the region.

Figure 10.2
Collisions and Fatality Rates for SACOG Region, 1998 to 2008



Based on Statewide Integrated Traffic Records System (SWITRS) data assembled by SACOG staff. VMT data for computing fatality rate from California Public Road Data reports, also assembled by SACOG staff. All data are for the six SACOG counties, including the Tahoe Basin.

* Fatality rate is the number of fatal and injury collisions

Source: SACOG, September 2011.

Transportation Security & Emergency Preparedness

Improved maintenance of the region's transportation system also includes addressing public safety and security concerns. With SAFETEA-LU calling for an increased emphasis on the safety and security of the transportation system, three key areas of regional concern have been identified:

- the ability to plan for and react to natural disasters;
- the capability to respond effectively to man-made events; and
- the interoperability of various public safety communication systems.

The region faces a number of potential emergency situations caused by natural events such as flooding and forest fires. The presence of two major rivers with significant flood risk—the American and Sacramento—is of particular concern for surrounding communities. Forest fires are a significant risk in the Sierra Nevada Foothills of the region, as seen in the summer of 2008 when California experienced a record number of forest fires. As discussed in Chapter 7—Environmental Sustainability, climate change is expected to exacerbate these risks in the Sacramento region.

Although disaster preparedness efforts often focus on urban areas because they contain more people and infrastructure, rural areas face more frequent threats from natural disasters. Expansive wooded and vegetative areas are significantly more vulnerable to fire. The California fires in 2008 burned nearly 300,000 acres of land and numerous homes, affecting rural areas in far larger proportion than urban areas. Many rural roads are composed primarily of dirt and gravel, leaving rural roads particularly susceptible to washing out during major floods. The impacts of fires that clear out vegetation coupled with heavy rains can create flash floods and/or mudslides that are capable of wreaking havoc on rural roads and communities. Many homes and properties are along rivers and creeks, leaving them vulnerable to levee breaches during major storms.

Rural areas also lack the emergency services and relatively quick response times that urban areas have, which can turn a small incident into a larger problem. Many rural communities surround the urban employment areas in the region, which creates evacuation challenges across the area's rivers in the event of a levee break or other flooding situation. In addition to providing for evacuation paths, the region needs to be prepared for the impacts such natural disasters could have on rural areas, including the region's agricultural supply and distribution network.

Since the terrorist attacks of September 11, 2011, the Sacramento region has focused more specifically on emergency preparedness as well as the security of the regional transportation system itself. Over the past few years, transportation security programs have been sponsored by Caltrans, SACOG's Transit Coordinating Committee, and federal agencies in the Sacramento area. Additionally, there are a number of current or pending efforts to plan for and respond to large-scale manmade or natural disasters and improve public communications systems to address such threats. The STARNET system mentioned above will help transportation facility and service operators and emergency responders coordinate on emergency response and evacuation scenarios, and provide more information for travelers via the 511 phone and internet systems. It is also important to identify critical corridors to move people and goods out of areas impacted by a disaster, and to improve transportation infrastructure in the region to facilitate evacuation planning and provide multiple evacuation routes.

Transit can play an important role during an emergency. In evacuation situations, buses can offer a vital service by moving large numbers of people to safer areas. Additionally, transit vehicles provide the opportunity to transport emergency responders and necessities (e.g., food, blankets) to disaster sites and to provide mobile cooling stations for fire fighters. However, evacuation of rural areas presents certain challenges that are not so prevalent in urban areas. Rural areas are much less dense than urban areas. This means that using mass transit vehicles to transport residents to safety is harder because the population is spread out over a larger land mass.

Many transit operators are not in a position to fund or implement emergency planning exercises and programs, especially given the current fiscal environment. Limited resources make shifting discretionary monies away from operations to emergency planning nearly impossible. In order to pay for exercise planning and training, transit operators have to rely on grants and other governmental sources. Through a Caltrans grant, SACOG is working with the region's transit operators on more coordinated emergency planning. Appendix C-2 offers an expanded discussion of the key areas concerning transportation safety and security in the MTP/SCS.

SACOG is participating in the California Emergency Management Agency (Cal EMA) Working Group on Hazard Mitigation Planning to offer regional coordination for the next update of the Cal EMA State Hazard Mitigation Plan. All six of SACOG's member counties have Multi-Hazard Mitigation Plans filed with Cal EMA that provide detailed analysis of both natural and human-caused threats to population and property within the SACOG region. SACOG will continue discussions with Cal EMA and the Federal Emergency Management Agency to identify the role this region has in hazard mitigation planning.

The SACOG staff is also working to develop a secure web-based reporting tool for transit operators to input their current fleet inventories to create an accessible link for Emergency Operations Centers to view and utilize fleet data to add to the available transportation resources in their county. The project is funded by a California Department of Transportation planning grant. The project will allow transit

operators to maintain current contact lists, fleet inventories, and other relevant data to be available to emergency planners throughout the six counties in the SACOG region. The tools are a direct result of the Department of Homeland Security After Action Report recommendations developed after the 2007 Transit Emergency Response exercise.

Additionally, work continues on administering the Proposition 1B Safety and Security Transit Program on behalf of Cal EMA. Staff accepts and reviews applications for transit operators with an annual allocation of more than $2 million. Since the inception of the program, projects such as a mobile dispatching vehicle, bus security cameras, fencing, and light rail station variable message signs have been funded through this program. The program is funded through bond sales and will continue through 2017.