



**2016**  
**Metropolitan Transportation Plan/  
Sustainable Communities Strategy**  
**BUILDING A SUSTAINABLE SYSTEM**

A green rectangular panel with a faint silhouette of a forest in the background. The text is centered and includes the year 2016, the title of the plan, and a yellow box containing the subtitle 'BUILDING A SUSTAINABLE SYSTEM'.







2016

# Metropolitan Transportation Plan/ Sustainable Communities Strategy

BUILDING A SUSTAINABLE SYSTEM









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## METROPOLITAN TRANSPORTATION PLAN/SUSTAINABLE COMMUNITIES STRATEGY

# Performance Measures for the MTP/SCS

The following tables are new to the MTP/SCS. They are designed to provide a quick reference to the range of measures used to assess the performance of the MTP/SCS, and where in the plan the measure and related analysis may be found.

## Land Use Measures

Indicator	Specific Measures	Page(s)
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	Employment growth by Community Type	29
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	Vernal pool acres developed	40
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	Proximity to transit by Community Type	73-75
Urban Design	Change in street pattern in different Community Types	73-75
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## Transportation Measures

Indicator	Specific Measures	Page(s)
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Comparison of transit and auto accessibility	Percent of jobs, retail jobs, medical jobs, higher education enrollments, park acres Accessible within 30 minutes by transit vs. car from LIHM and Non- LIHM Areas	206
Toxic air contaminants	Percent of population in LIHM and Non- LIHM areas within 500 feet of high-volume roadway by county, region	207-208





2016

# Metropolitan Transportation Plan/ Sustainable Communities Strategy

Building a Sustainable System



## Building a Sustainable System

**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 2016 Metropolitan Transportation Plan/Sustainable Communities Strategy (2016 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 improving the conditions of existing roads and adding more sidewalks, bike lanes, and restoring, maintaining and expanding transit, making it possible for more people to have many choices for how they get around and live independently as they age. The 2016 MTP/SCS also plans for the future by

including roads and transit projects where new houses and jobs are added to serve today's children as they grow up and for new residents anticipated to move here over the next few decades.

FOR MORE BACKGROUND INFORMATION ON THE PLAN, SEE CHAPTER 1. FOR MORE INFORMATION ON THE PLANNING PROCESS, SEE CHAPTER 2.

### 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

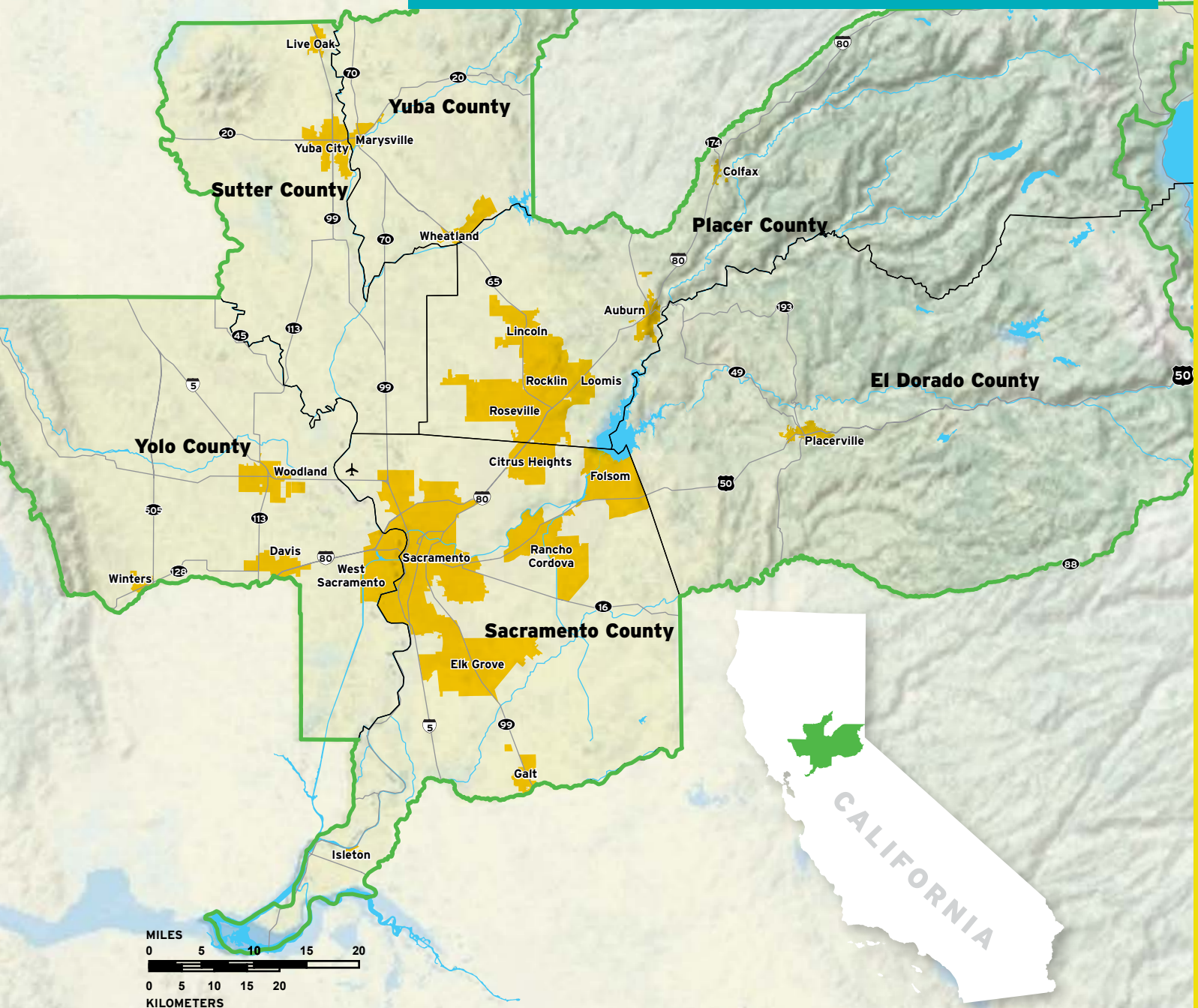
Provide real, viable travel choices for all people throughout our diverse region.

## Sacramento Metropolitan Planning Area

- SACOG Planning Area
- City Boundaries
- County Boundaries
- Rivers/Lakes

SACOG is designated by the state and federal governments as the Metropolitan Planning Organization (MPO) and is responsible for developing a regional transportation plan every four years in coordination with El Dorado, Placer, Sacramento, Sutter, Yolo and Yuba counties and the 22 cities within those counties (excluding the Tahoe Basin). The 2016 MTP/SCS covers the period from 2012 to 2036. 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, residents, public and private sector stakeholders, and SACOG staff, and actively deliberated on the plan during all stages of development.

FOR MORE INFORMATION ON THE PLANNING PROCESS, SEE CHAPTER 2.





## Transportation Budget and Performance

The 2016 MTP/SCS will make investments totaling \$35 billion (in today's dollars) to improve the regional transportation system. 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 and supports the fix-it-first initiative of this plan.

Successful transportation plans 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 2016 MTP/SCS planning process, the performance focus has been on the following critical indicators:

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

Between 2012 and 2036 the region will spend \$35 billion in federal, state and local funds on transportation.

<b>Road and Highway Maintenance and Rehabilitation</b>	<b>\$12.6 billion</b>
<b>Road and Highway Capacity</b>	<b>\$5.8 billion</b>
<b>Transit Operations</b>	<b>\$7.1 billion</b>
<b>Transit Capital</b>	<b>\$3.5 billion</b>
<b>Bicycle and Pedestrian Improvements</b>	<b>\$2.8 billion</b>
<b>Planning, Programs, and Enhancements</b>	<b>\$1.7 billion</b>
<b>System Management and Operations</b>	<b>\$1.5 billion</b>
<b>Total</b>	<b>\$35 billion</b>

FOR MORE INFORMATION ON PLAN BUDGET AND INVESTMENTS, SEE CHAPTER 4. FOR MORE INFORMATION ON TRENDS AND PERFORMANCE, SEE CHAPTER 5.









## Fix-It-First: Improving the State of Good Repair

Focus on maintaining and improving infrastructure in existing communities and where there is current need.

**The 2016 MTP/SCS spends \$12.6 billion to preserve, maintain, and rehabilitate the region's roads, highways, bridges, trails, sidewalks, and other bicycle and pedestrian facilities. Transit also benefits from road maintenance projects in that many road rehabilitation projects include complete street designs that make the road safer for, and more inclusive of, transit.**

Cities and counties face a critical challenge in providing adequate maintenance and rehabilitation for their roads with a dwindling pot of state and federal funds. 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, reinvestment in urban and suburban areas, and transit. The plan area covers approximately 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.

For the 2016 MTP/SCS, the SACOG Board of Directors focused on preserving existing assets and reducing maintenance backlogs before adding new infrastructure that would require even more maintenance spending in the future. Compared to historic investments, the 2016 plan increases the budget for maintenance and rehabilitation by more than \$2 billion in today's dollars or 20 percent. Around two-thirds of the plan's maintenance and rehabilitation budget is related to city and county maintenance of local streets and facilities. The balance is administered by Caltrans for maintenance of the state highway system. The increased maintenance budget is an important part of the plan's fix-it-first focus, but there is still a significant gap between the funding available and the funding needed for road maintenance in our region.

Many road maintenance or rehabilitation projects present opportunities to improve the travel experience of bicyclists, pedestrians, and transit riders. In addition to the direct investments assumed for the bicycle and pedestrian budget, discussed below, SACOG assumes that when appropriate and feasible, maintenance projects will include bicycle and pedestrian components such as striping and signage, sidewalk gap closures, ADA retrofits, and intersection improvements. Maintenance projects can also make the road safer for all users, including passenger vehicles, transit, bicycles and pedestrians.

FOR MORE INFORMATION ON PLAN BUDGET AND INVESTMENTS, SEE CHAPTER 4. FOR MORE INFORMATION ON TRENDS AND PERFORMANCE, SEE CHAPTER 5.



## Investment in system maintenance and rehabilitation

The 2016 MTP/SCS allocates about a third of the budget for maintaining and operating the existing road and highway system.

## Fewer miles of driving per person

Bucking historic trends of increasing miles of driving, the MTP/SCS shows a decline in household-generated VMT per capita of **6 percent**. A number of factors contribute to this VMT reduction, including: greater accessibility to jobs, schools, shopping, and services; a better mix of land uses and improved jobs/housing balance; improved transit service and walkability; and demographic factors.

### Types of road maintenance and rehabilitation projects include:



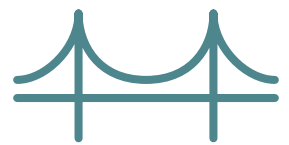
routine and preventive maintenance projects intended to extend the life of roads, and highways, including sealing cracks, repairing pavement, cleaning and repairing drains, fixing signals, and sweeping streets;



more extensive repair, rehabilitation, and reconstruction of roads, including, repaving, reconstructing 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, and railing replacements on bridges.

## Strategic and Cost-Effective Road and Bridge Investments

**The 2016 MTP/SCS spends \$5.8 billion on road, highway and bridge operational and capacity projects.**

### Local Road Investments

The 2016 MTP/SCS invests \$4.2 billion in local roads to accommodate projected growth. Aligned with the plan's fix-it-first focus, the local road investments have an emphasis on operational improvements to improve system productivity over capacity projects. More than 90 percent of new lane miles in this MTP/SCS are on surface streets, not freeways. 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:

- New and expanded urban arterial roadways are designed 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 2036 horizon year. These expansions include complete streets features to support transit and bicycle/pedestrian travel.
- Connectors, including the Placer Parkway in southern Placer County and the Capital 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 Capital Southeast Connector in the MTP/SCS is an expansion of existing segments of Kammerer Road, Bruceville Road, Grant Line Road, and White Rock Road.

### State Highway Investments

The 2016 MTP/SCS invests \$1.6 billion in projects that will primarily be carried out by Caltrans. The investment focus is on strategic new carpool lanes, auxiliary lanes,

and interchanges along 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 for effective movement of goods throughout the region and for traffic management, as each truck represents the traffic-generating equivalent of two to four automobiles in stop-and-go traffic.

### 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 on the Capital City Freeway (SR 51) from J Street to Arden Way.
- Auxiliary and transition lanes at and between major interchanges to improve traffic flow.
- New interchanges with major arterials along freeways in high growth areas including along Highway 50 in Folsom and El Dorado, the junction of Highway 65 and I-80, and the interchange at Highway 99 and Riego Road in Sutter County.

### Bridge and River Crossing Investments

The 2016 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.

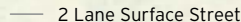
### Example bridge projects include:

- 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 2036.
- Feather River Crossing- Improvements to the 5th Street Bridge, with redesigned approaches and distribution on both ends, to link Yuba City and Marysville more effectively.
- 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.

FOR MORE INFORMATION ON PLAN BUDGET AND INVESTMENTS, SEE CHAPTER 4. FOR MORE INFORMATION ON TRENDS AND PERFORMANCE, SEE CHAPTER 5.



# 2036 Local Road and Highway Network

-  2 Lane Surface Street
-  4 Lane Surface Street
-  6 Lane Surface Street
-  Connectors
-  Freeway/Expressway
-  Rural Highway
-  Freeway with Carpool Lanes
-  Auxiliary Lane
-  County Boundaries



# Public Transit Investments

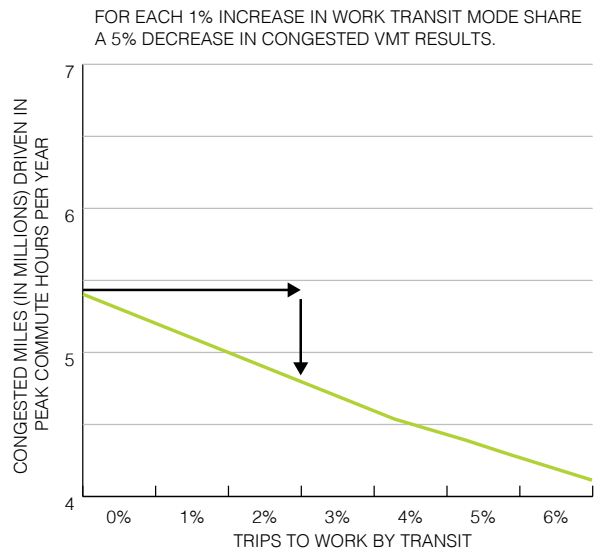
**The 2016 MTP/SCS provides \$10.6 billion in transit capital and operating investments. Most of this investment (67 percent) is consumed by the cost of operating and maintaining the transit system. Intercity rail operations take up about 7 percent of the transit budget, or roughly \$800 million, and are covered by state funding outside the control of regional operators. The remaining \$3.5 billion 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.**

Providing high-frequency service of 15 minutes or better in areas with more compact and mixed uses allows the 2016 MTP/SCS to provide cost-effective and productive transit service. Because of higher productivity, there is a significantly higher percentage of operating costs covered by fares - rising from around 24 percent of operating costs in 2012 to 38 percent of operating costs by 2036. The additional \$2.2 billion generated by the higher fare box recovery is reinvested in the transit system to have a larger impact: with the increased transit productivity, by 2036 the MTP/SCS provides roughly double the amount of transit service provided in 2012 and increases total daily transit trips by more than 200 percent.

The 2016 MTP/SCS provides increased transit coverage across the region, but focuses on corridors with land uses that support productive transit services. 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 2016 MTP/SCS achieves a reduction in congested vehicle miles traveled (CVMT) by 2036. The reduction is driven by two factors in the MTP/SCS. First, road capacity investments include a significant number of projects that resolve or decrease major existing bottlenecks. Second, the MTP/SCS includes new transit options on several major congested travel corridors. Overall transit mode share increases, but commute transit share increases dramatically—from about 2.5 percent in 2012 to nearly 7 percent in 2036. There is a strong relationship between commute travel mode share and the level of CVMT experienced during the peak period. For each incremental percentage point in commute travel transit share, congested VMT decreases by 5 percent.

### Transit Mode Share and Congested Travel in the SACOG Region





**Types of MTP/SCS transit projects include:**

- Increased transit options in 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 more than half of all transit services (bus and rail) to operate 15-minute or better service by 2036, versus less than a quarter today.
- Expansion of ADA paratransit services to keep up with the fast-growing senior population. The MTP/SCS 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.
- Increased transit security (e.g., patrols, lighting) and trash collection to enhance the transit experience.

FOR MORE INFORMATION ON PLAN BUDGET AND INVESTMENTS, SEE CHAPTER 4. FOR MORE INFORMATION ON TRENDS AND PERFORMANCE, SEE CHAPTER 5.

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

**Transit passenger boardings by 2036 are projected to be 511,200, nearly tripling from today.**

**Compared to today, transit service hours more than double by 2036.**

MORE INFORMATION ON TRENDS AND PERFORMANCE, SEE CHAPTER 5.

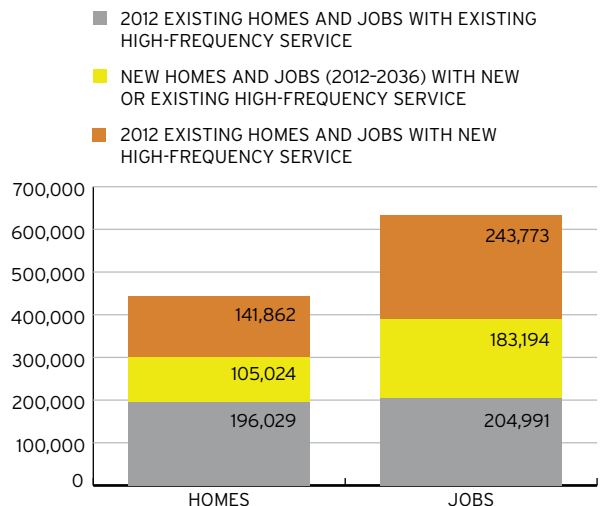
**Transit Priority Areas**

Transit is most efficient where there are higher densities of people, so locating more new homes and jobs near transit maximizes transit investments. Transit Priority Areas (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.

By 2036, one-third of homes and over half of all jobs will be located within a 1/2-mile of high quality transit service (transit service with frequency of 15 minutes or better), increasing the potential number and desirability of daily trips made by transit. Additionally, adding transit service in areas with good supporting land uses magnifies the effects of the additional services.

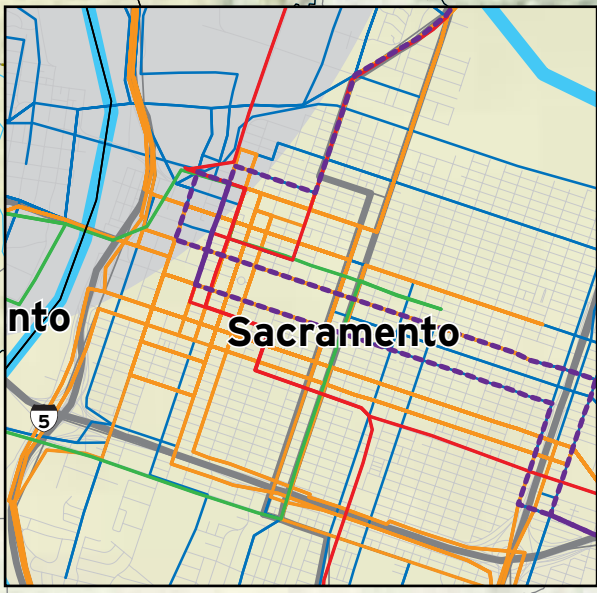
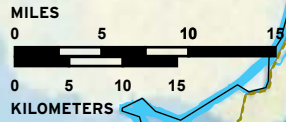
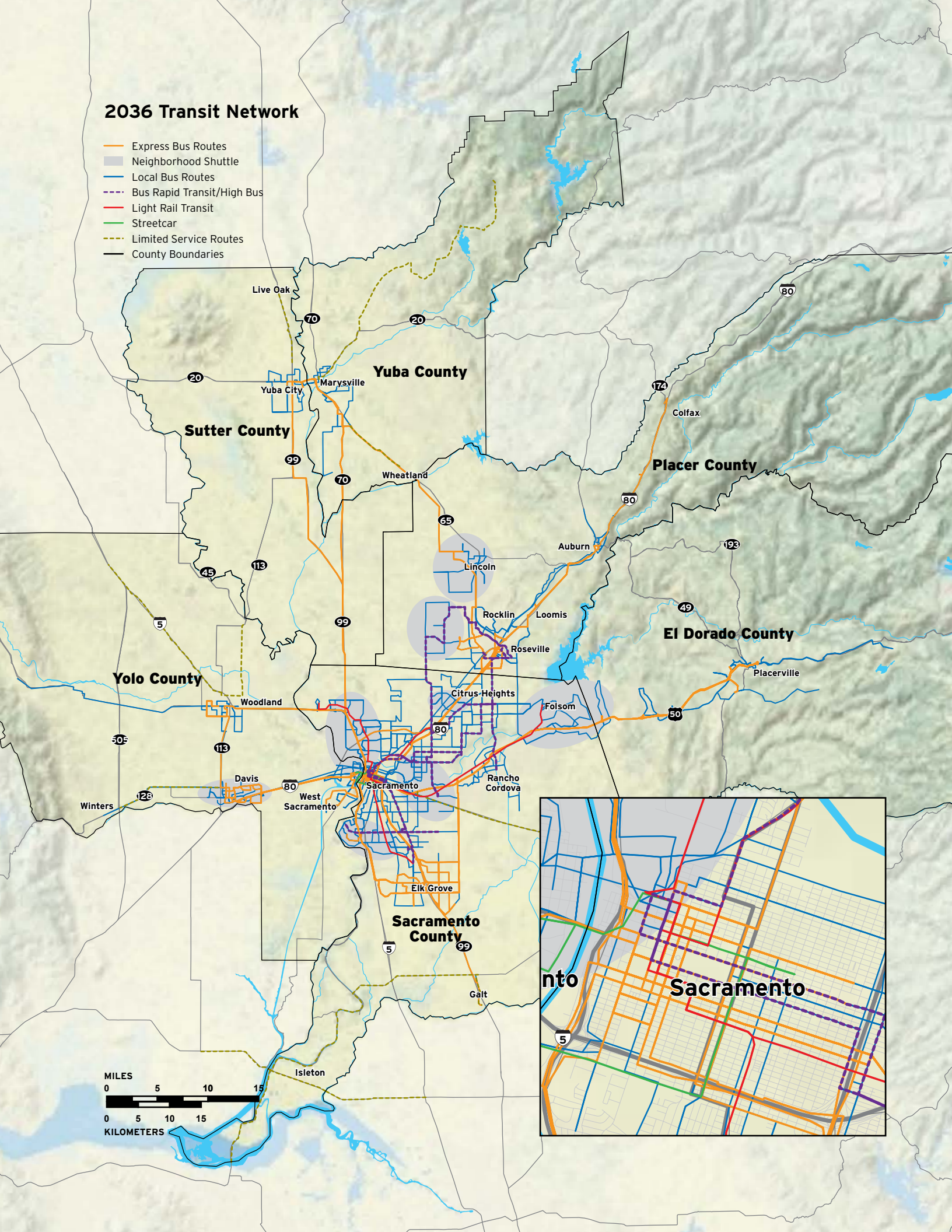
FOR MORE INFORMATION ON TRENDS AND PERFORMANCE, SEE CHAPTER 5.

**Housing and Employment within Transit Priority Areas, 2012-2036**



# 2036 Transit Network

- Express Bus Routes
- Neighborhood Shuttle
- Local Bus Routes
- Bus Rapid Transit/High Bus
- Light Rail Transit
- Streetcar
- Limited Service Routes
- County Boundaries





## Bicycle and Pedestrian Investments

The 2016 MTP/SCS spends \$2.8 billion in direct investments for bicycle and pedestrian projects. This is in addition to “complete street” investments included in road maintenance and capacity projects. Travel by non-motorized modes is important because the prevalence of travel by the major non-motorized travel modes (i.e., bicycling and walking) is a strong indicator of good access to daily needs and services. 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 shortcuts can enhance the appeal of both non-motorized and transit modes.

### Types of bicycle and pedestrian projects in the 2016 MTP/SCS:

- Sidewalk 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 (e.g., light rail, BRT) and at key activity centers (e.g., downtowns, shopping malls, large office complexes).

FOR MORE INFORMATION ON PLAN BUDGET AND INVESTMENTS, SEE CHAPTER 4. FOR MORE INFORMATION ON TRENDS AND PERFORMANCE, SEE CHAPTER 5.



**The MTP/SCS provides \$2.8 billion for bicycle and pedestrian improvements. Another nearly \$600 million, or about 5% of the road maintenance and rehabilitation budget, is estimated to be spent on bicycles and pedestrians as part of rehabilitation projects.**

## System Management and Operations

The 2016 MTP/SCS invests \$1.5 billion in system management and operational improvements. These investments are intended to improve the efficiency and safety of the transportation system. Operational improvements can offer an effective alternative to adding new capacity to the roadway system by improving the flow of traffic on existing lanes.

### Examples of system management and operations investments in the 2016 MTP/SCS:

- Road operational improvements for rural and small communities. Improving roadway safety along farm-to-market routes and corridors along the urban/rural edge. Operational improvements include closing shoulder gaps, improving rural road intersections, and safer crossings within communities divided by highways or railroads.
- 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 Bus Rapid Transit corridors and improve access to transit-oriented developments. The focus areas for these investments are in existing transportation corridors and established communities.

- 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 collisions. Safety investments are also made at rail grade-crossings and urban interchanges.
- Safer crossings at major freight and passenger rail lines for automobiles, bicyclists, and pedestrians.
- 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.

FOR MORE INFORMATION ON PLAN BUDGET AND INVESTMENTS, SEE CHAPTER 4.

## Programs, Planning, and Operations

The 2016 MTP/SCS provides \$1.7 billion for supplementary programming and planning efforts. These efforts include funding to encourage smart growth development, Transportation Control Measures (TCMs), Intelligent Transportation Systems (ITS) such as crosswalk signals and transit signal priority for buses, 511 traveler information, investments in community enhancements such as traffic calming and streetscape features, and Travel Demand Management (TDM) programs, such as May is Bike Month.





## A Growing Region, Growing Options

**Over a decade ago the Sacramento region adopted the Blueprint, a 50-year vision of sustainable growth. The Blueprint was embraced by the region because it defined a future of diverse housing and transportation choices, revitalized communities, more efficient development patterns, cleaner air, preserved natural resources, and enhanced quality of life. Implementation has been both regional and local. Regionally, SACOG uses its MTP/SCS to identify, in collaboration with cities, counties, transit agencies, the nearer term (20, not 50 years) growth and transportation investment priorities. Locally, cities and counties have been updating general plans and development codes to allow and encourage Blueprint-friendly development and transit districts.**

A foundation of the 2016 MTP/SCS transportation and land use forecast assumptions is the regional growth forecast. All of the performance measures of the plan are a result of the integration of land use and transportation. A body of growing research and knowledge confirms that the relationship between transportation and land use directly relates to travel outcomes. How many jobs and activities are near place of residence, the mix of those uses, the density, and proximity to transit are all land use factors that play a key role in traveler choice and the travel and air quality performance of the MTP/SCS. In fact, in the SACOG region, the coordinated

implementation of transportation and development is essential to meeting the region's state greenhouse gas reduction targets.

The 2016 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 through 2036. 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. This analysis includes a realistic estimate of future supply, based on the availability and economic feasibility of infrastructure, floodplain issues, natural resources issues, feasibility and timing of securing permits, and timing of local approvals, and a realistic estimate of future demand, based on historical trends, policy and/or regulatory trends, market assessments, and availability of economic incentives.

Including growth within the 2016 MTP/SCS footprint is not a guarantee that it will happen. Likewise, growth in areas outside the footprint may occur by 2036. 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.

FOR MORE INFORMATION ON GROWTH AND THE LAND USE FORECAST, SEE CHAPTER 3.

### A Growing & Aging Region



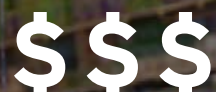
**811,000  
More People**



**285,000  
New Homes**

**\$35b**

**Transportation  
Investment  
Budget**

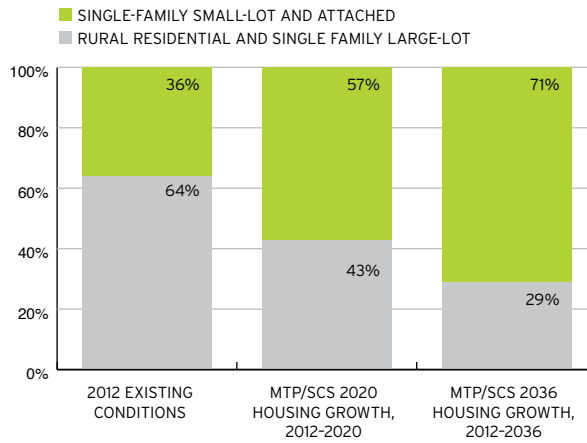


**439,000  
New Jobs**

**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. 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. As a result of this projected demand and the Blueprint-supportive planning that local agencies have adopted, the 2016 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**

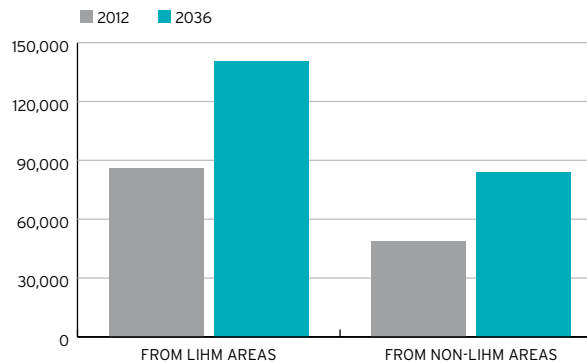


- Rural Residential: single-family detached homes built at densities less than 1 dwelling unit per acre.
- Large-Lot Single-Family: single-family detached homes built at densities between 1 and 8 dwelling units per acre.
- Small-Lot Single-Family: single-family detached homes built at densities between 8 and 25 dwelling units per acre.
- Attached Residential: Single-family or multi-family homes ranging from duplexes, triplexes, apartments, condominiums, townhomes, rowhouses, halfplexes, etc. built at densities from 8 to over 50 dwelling units per acre.

**Accessibility:**

The 2016 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 Low Income and High Minority (LIHM) areas because they tend to use transit, walking, and bicycling at significantly higher rates than Non-LIHM households—more than twice the rate for transit use and a 55 percent greater rate for walking and bicycling region-wide. FOR MORE INFORMATION ON EQUITY AND CHOICE, SEE CHAPTER 8.

**Transit Access to Jobs**







### Reduce Impacts on Farmland

By focusing growth in and near areas of the region with existing development, fewer acres of farmland are converted to urban uses than in the past.

CHAPTER 7 INCLUDES A FULL DISCUSSION ON ENVIRONMENTAL SUSTAINABILITY.

### 1988-2012

# 285

For every 1,000 new residents, 285 acres of farmland urbanized

### 2012-2036

# 49

For every 1,000 new residents, 49 acres of farmland urbanized



## Community Types Framework

SACOG created a framework for 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. 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 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 2012 and in 2036.



### Developing Communities

Developing Communities are typically situated on vacant land at the edge of existing urban or suburban development; they are the next increment of urban expansion. Transportation options in Developing Communities often depend on the timing of development. Bus service 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

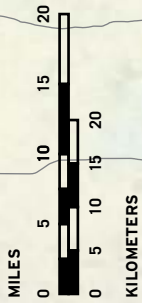
Rural Residential Communities are typically located outside of urbanized areas and are predominately residential, with some small-scale hobby or commercial farming. Travel occurs almost exclusively by automobile and transit service is minimal or nonexistent.



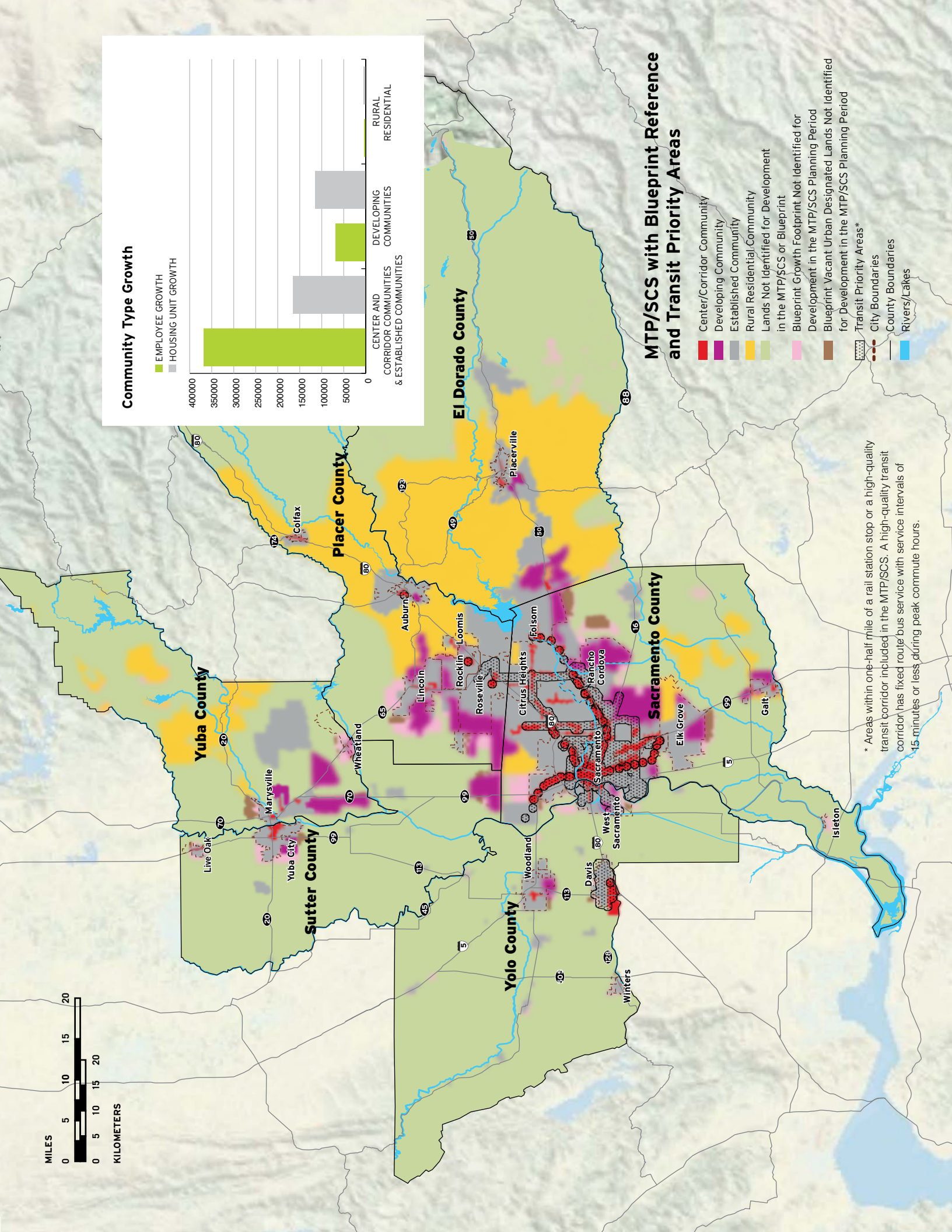
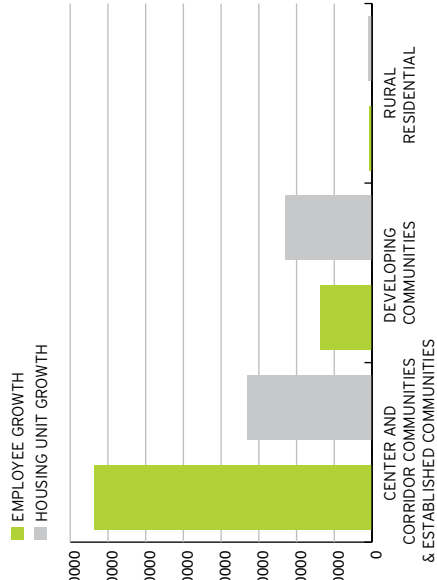
### Lands Not Identified for Development in the MTP/SCS Planning Period

These areas of the region are not expected to develop to urban levels during the MTP/SCS planning period.





### Community Type Growth



### MTP/SCS with Blueprint Reference and Transit Priority Areas

- 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

\* 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.

## Implementing the MTP/SCS

**The 2016 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.**

Implementation of the MTP/SCS is carried out gradually through shorter-term decisions that assign local state or federal funds to specific transportation projects through periodic funding cycles. The MTP/SCS is an important step in prioritizing the transportation system needs of the region over the next 25 years and it also sets the stage for the short-term strategy for implementation. Some of the policy commitments of the plan include: continued work to prioritize system maintenance and rehabilitation; continued development of project level decision-support tools for transportation investment; raising awareness of, and addressing the unique issues of the range of communities in the SACOG region - suburban, rural, urban and small towns; address climate adaptation of the transportation system; identify strategies for complete streets improvements, and road rehabilitation.

SEE CHAPTER 6 FOR THE SPECIFIC POLICIES AND SUPPORTING STRATEGIES.

**To follow the implementation progress of the 2016 MTP/SCS, sign up to receive SACOG newsletters at [sacog.org](http://sacog.org).**

## CHAPTER 1

# Building a Sustainable System

## Introduction

The Metropolitan Transportation Plan/Sustainability Communities Strategy for 2036 (2016 MTP/SCS) is an important milestone along the path of inclusive, equitable, integrated transportation and land use, performance-based planning that the Sacramento Area Council of Governments (SACOG) and the residents of the region began more than a decade ago. As the Sacramento region's integrated transportation and land use plan, the 2016 MTP/SCS has many beneficial features:

- builds on the guiding principles and high performance of the 2012 MTP/SCS;
- increases investment in maintaining and rehabilitating the existing road and transit system;
- 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 and 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;
- continued implementation of the ongoing Rural-Urban Connections Strategy; and
- reductions in per person passenger vehicle greenhouse gas emissions that meet the reduction targets established

for the SACOG region by the California Air Resources Board.

The 2016 MTP/SCS is an implementation-focused plan. It focuses on overcoming challenges to plan implementation and making progress on the policy commitments of the 2012 plan with the goal of accelerating the region's progress toward the transportation, air quality, and quality of life outcomes set forth in 2012. The challenges for plan implementation and meeting the policy commitments outlined in the plan are broadly defined under the following themes:

- **Transportation Funding:** Identify all reasonably foreseeable revenue from all sources local, state and federal.
- **Investment Strategy:** Increase the plan's investment in system maintenance and rehabilitation - "fix-it-first" investments.
- **Investment Timing:** Consider changes to the timing of transportation investments in order to shift funding earlier in the planning period into system maintenance and rehabilitation investments, while maintaining the air quality and travel performance of the transportation system.
- **Land Use Forecast:** Re-examine the economic viability of projected growth in all parts of the region to ensure assumptions about growth are reasonably foreseeable.
- **Plan Effects:** Follow through on the implementation commitments of the 2012 plan to research and develop performance measures to better measure the effects of the MTP/SCS on different people and issues areas.

**The 2016 MTP/SCS is an implementation-focused plan.**

## Foundational Planning Initiatives

The following is a brief summary of the major planning initiatives that have provided the foundation for this plan.

### Sacramento Region Blueprint

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 and engagement process resulted in the SACOG board's unanimous adoption of the Sacramento Region Blueprint in December 2004. In many ways, the Blueprint fundamentally changed the region's future.

The Sacramento Region 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 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. Using these strategies, SACOG quickly earned 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 Sacramento Region Blueprint process focused on what types 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 population age 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 Sacramento Region 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 clearly demonstrated that mixed land use patterns, when paired with supportive transportation investments, would significantly reduce the length of vehicle 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 of Directors emerged to fundamentally change the way the Sacramento region would grow in the future.

In 2004, the SACOG board adopted the Sacramento Region Blueprint map with areas best suited for future housing and employment growth through 2050, as well as future lands needed for growth after 2050, and the following seven Blueprint growth 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 of land uses.

The Sacramento Region Blueprint is a voluntary growth strategy that the 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, including 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 began to embrace many of the Blueprint principles very rapidly, 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 rural areas. For more information about the Blueprint, see Appendix E-1 - Blueprint Special Report.

### **2008 Metropolitan Transportation Plan**

The Blueprint provided the land use foundation for the subsequent MTP, the MTP for 2035 (2008 MTP). The 2008 MTP was 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 person heavy congestion was still projected to increase through 2035, but at a much slower rate of 19 percent compared to 60 percent. The percentage of trips using alternative modes to the automobile increased substantially, while 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

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 2008 MTP. Leadership by the Sacramento Metropolitan Air Quality Management District led the U.S. Environmental Protection Agency to allow SACOG to use future MTPs 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 2008 MTP that committed SACOG to future actions to reduce air emissions from the transportation system, including development of a Rural-Urban Connections Strategy.

### Rural-Urban Connections Strategy

In 2008, SACOG launched the Rural-Urban Connections Strategy (RUCS). The RUCS program is designed to help implement the Sacramento Region 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. The program is ongoing and the 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

Six months after the 2008 MTP was adopted, a major state law was passed: Senate Bill 375 (Chapter 728, Statutes of 2008). This law was significantly influenced by the Sacramento Region Blueprint and other smart growth scenario planning initiatives in San Diego, the Bay Area, and Los Angeles. The law requires Metropolitan Planning Organizations (MPOs) to integrate regional land use, housing, transportation, and climate change planning in MTPs. It requires the California Air Resources Board (ARB) to set performance targets for passenger vehicle emissions in each of 18 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 the California Environmental Quality Act (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 integrated 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 the MTP/SCS has been significantly influenced by SB 375. The largest impacts include:

- elevation of greenhouse gas emissions as a performance metric that influences the plan;
- explicit integration of the land use patterns in the plan with associated impacts on Regional Housing Needs Allocations and transportation investments;
- preparation of an Environmental Impact Report under CEQA that thoroughly analyzes land use impacts from the MTP/SCS as well as transportation impacts;
- explicit and thorough documentation of the land use component of the plan so that local govern-

ments 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;

- identification and mapping of Transit Priority Areas in 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 a regional transportation plan/SCS under the new SB 375.

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. As provided for in SB 375, the MTP/SCS 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. 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. 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 imposed new criteria, the fundamental transportation, land use and air quality integration that SACOG has engaged in for the past several planning efforts comprise the core of its planning.

### **2012 Metropolitan Transportation Plan/ Sustainable Communities Strategy**

The 2012 plan was 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. The 2012 plan was the first prepared during a major, sustained national recession that in many ways challenged California and the Sacramento region more than the rest of the country. State budget cuts and the collapse of the residential construction sector severely damaged two of the strongest sectors of the region's economy. The 2012 plan reflected those economic realities in a number of ways, including lower forecasted growth rates and transportation revenues than the prior plan, more attention to land use patterns that optimize transportation performance, and dedicating scarce revenues to those transportation investments that produce the highest performance benefits. In these ways, the 2012 plan sought to turn the short-term recession challenge into a foundation for long-term success for the region.



## Related State and Federal Planning Initiatives

### California Strategic Growth Council

Another state law, SB 732 (Chapter 729, Statutes of 2008), passed in 2008, establishes an interagency Strategic Growth Council charged with aligning state policies and actions to promote sustainability and administering funding in the form of planning grants for regional and local governments from revenue from the Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act, also known as Proposition 84. SACOG has been awarded grant funding to provide technical assistance to local governments to complement their implementation of the 2012 MTP/SCS and the Sacramento Region Blueprint.

Work funded by the Strategic Growth Council includes implementing the Rural-Urban Connections Strategy through: a food access assessment, monitoring activities to protect agricultural lands and improve farm-to-market travel, studies to better understand agricultural labor housing needs, and analysis of the public infrastructure needs, including associated costs and revenues, of rural communities.

Strategic Growth Council funding also supported development of a regional climate action plan by SACOG and its planning partners. Focused on the land use and transportation sectors, this climate action planning including a base greenhouse gas inventory, identification of climate risks, identification and quantification of greenhouse gas mitigation measures, potential impacts and adaptation strategies, and setting of regional greenhouse gas reduction targets.

SACOG worked with local jurisdictions to expand regional tools and local guidance for addressing parking standards and complete streets in different contexts in the region, including through road maintenance and rehabilitation projects and approaching streets as vital public spaces. SACOG also coordination with the region's air districts on regional guidance for residential infill development to maximize health benefits and minimize health risks.

Most recently, SACOG has partnered with member jurisdictions to remove critical barriers to local implementation of the MTP/SCS through the following efforts:

- removing regulatory and institutional barriers to revitalization and intensification in Centers and Corridors and Established Communities,
- advancing healthy communities through active design and active transportation implementation, and
- community revitalization and capacity-building in low-income and high minority neighborhoods.

### Federal Partnership for Sustainable Communities

The Partnership for Sustainable Communities existed between the federal Department of Transportation, Department of Housing and Urban Development, and Environmental Protection Agency. The partnership focused on promoting the type of inclusive, integrated regional planning that SACOG has committed to over the last decade through grant-making. In 2010, SACOG was awarded a grant to support outreach and analysis for the 2012 MTP/SCS, primarily to assist with activating the CEQA regulatory reform benefits in SB 375 for Transit Priority Projects. SACOG continues to leverage the results of that work both in updating this MTP/SCS and in the SCS implementation activities described above that are funded in part through the Strategic Growth Council.

### Senate Bill 391 and the California Interregional Blueprint

Similar to requirements for regional transportation plans under SB 375, SB 391 (Chapter 585, Statutes of 2009) requires the State's long-range transportation plan, the California Transportation Plan, to meet Califor-

nia's climate change goals under AB 32 and Executive Order S-03-05. In response to these statutes, Caltrans prepared 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 California Interregional Blueprint integrates 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. The upcoming California Transportation Plan 2040 (CTP 2040) will demonstrate how major metropolitan areas, rural areas, and state agencies can coordinate planning efforts to achieve statewide goals.

**This plan update is the second generation MTP/SCS: it builds upon the strong transportation, air quality and quality of life performance of the 2012 MTP/SCS by strengthening investment strategies and policy commitments that are critical to the implementation of this 20-year plan.**

## Conclusion

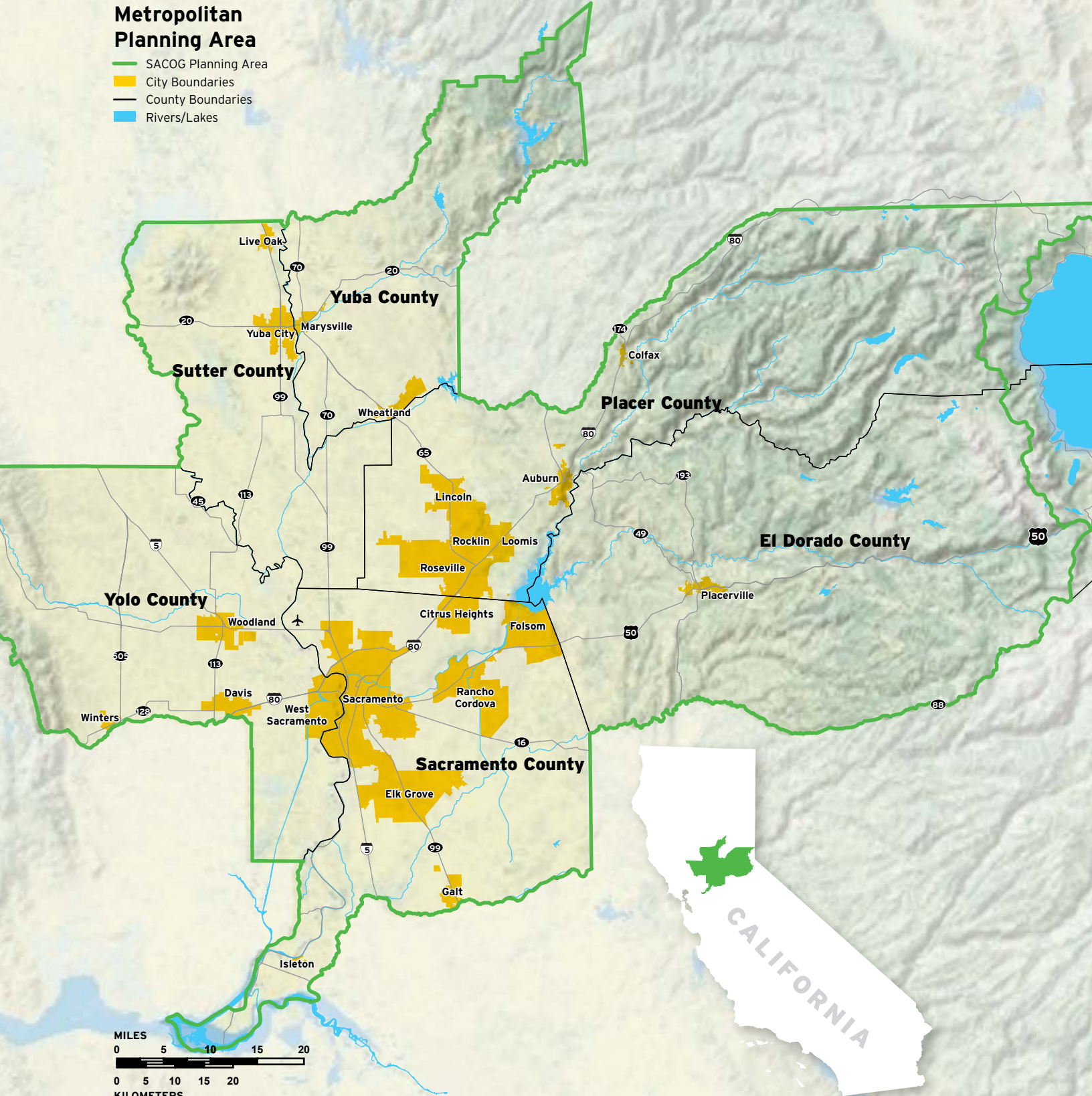
This MTP/SCS is another important milestone in SACOG's commitment to bringing the highest quality data, analysis and modeling tools to an inclusive, integrated, performance-based transportation and land use plan. This plan update is the second generation MTP/SCS: it builds upon the strong transportation, air quality and quality of life performance of the 2012 MTP/SCS by strengthening investment strategies and policy commitments that are critical to the implementation of this 20-year plan.

The title of MTP/SCS is purposeful. SACOG views the SCS not as a separate and distinct element of the plan, but rather as 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 low income and high minority communities, 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 further advance implementation of the Sacramento Region Blueprint that the SACOG Board of Directors established over a decade ago.

Figure 2.1

# Sacramento Metropolitan Planning Area

- SACOG Planning Area
- City Boundaries
- County Boundaries
- Rivers/Lakes





## 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 is 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. A nonattainment area is an area considered to have air quality worse than the National Ambient Air Quality Standards as defined in the Clean Air Act Amendments of 1970. 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. More information on these nonattainment areas is in Chapter 7: Environmental Sustainability.

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 region-wide, long-range transportation planning in 1962 so that planning for highways, roads, and public transit would be comprehensive and cooperative between local agencies and governments. The law further requires the long-range regional transportation plan to cover at least a 20-year planning horizon, and be updated at least every four years.

If a city, county, or public agency in the Sacramento region wants to use federal transportation funding for projects or programs, those projects must be included in the MTP/SCS project list. The MTP/SCS includes

transportation improvements and investments that will serve the Sacramento region's projected land use pattern and population growth for a 20 year period. All transportation projects that are regionally significant for potential air quality impacts must also be included in the MTP/SCS. SACOG works collaboratively with local government planning and public works departments, transit service providers, air quality management districts, state and federal transportation departments, stakeholder interests, and residents across the region to develop the land use forecasts and transportation system for the MTP/SCS.

This plan, the 2016 MTP/SCS covers the period from 2012 to 2036 and is an update to the 2012 Metropolitan Transportation Plan/Sustainable Communities Strategy that was adopted in April 2012. This MTP/SCS provides the regional plan for transportation investments, integrated with projected land use, and funding constraints the region can reasonably expect to see through 2036. The plan takes an integrated approach to transportation and land use, and their impacts on air quality and climate change, with a focus on implementation and maintenance of the existing transportation system to achieve a number of transportation and air quality benefits across the region.

In order to comply with Senate Bill 375 (SB 375) and federal regulations, the 2016 MTP/SCS must be adopted by February 2016 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. 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-7 – Regulatory Framework for the MTP/SCS.

## How Was this Plan Created?

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, residents, public and private sector stakeholders, 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 – Congestion Management Process.

The development of this MTP/SCS began in 2013 and can be generally divided into four planning phases, each inclusive of public and private stakeholder participation, jurisdiction and partner agency coordination and consultation, and regular direction from the SACOG board. The four areas are:

- Issue Exploration and 2016 MTP/SCS Policy Framework
- Scenario Development Framework and Analysis
- Framework for Draft Preferred Scenario
- Preferred Scenario Development and Analysis

Further discussion of the local agency, stakeholder and public involvement is in the “Who Was Involved in the Plan Development?” section of this chapter.

### **2016 MTP/SCS Policy Framework**

In August through November of 2013, the SACOG Board engaged in an issue identification and exploration period that examined the implementation challenges of the 2012 MTP/SCS. This included a review of statewide and local transportation funding challenges and needs, road maintenance challenges, a review of the regional growth projections, a briefing on regional travel behavior and the current housing market. This research and educational period led to Board action on a policy framework for the 2016 MTP/SCS in December of 2013. This policy framework focused the 2016 MTP/SCS to be a true update of the 2012 MTP/SCS, rather than an overhaul. The framework was focused on addressing the implementation challenges of the current plan and directed this 2016 MTP/SCS to address five key implementation themes. These are described on the next page.

Implementation Question/Challenge	Examples of research and analysis to address question/challenge
<p><b>Transportation Funding: Can the region capture the revenues projected to come from all sources local, state and federal?</b></p>	<ul style="list-style-type: none"> <li>• Update revenue projections for local, state and federal sources, considering long-term/historic and short-term/recent losses or revenue.</li> <li>• Identify strategies for new revenue generation and cost-effective investments.</li> </ul>
<p><b>Investment Strategy: Is there enough emphasis on system maintenance (“fix-it-first”) investments?</b></p>	<ul style="list-style-type: none"> <li>• Identify and compare local and state system maintenance needs for different modes of travel.</li> <li>• Identify tradeoffs between system maintenance and system expansion priorities.</li> <li>• Identify unique challenges and opportunities in urban, suburban and rural communities, with particular attention to suburban economic challenges.</li> <li>• Identify new strategies for SACOG planning and funding efforts that consider fix-it-first.</li> </ul>
<p><b>Investment Timing: Should there be changes in the timing of transportation investments?</b></p>	<ul style="list-style-type: none"> <li>• Examine the cost effectiveness of moving certain projects forward or backward in the planning period.</li> <li>• Analyze the effect of project phasing on performance of the regional transportation system, air quality, and land use pattern.</li> <li>• Identify short-term strategies to improve regional travel patterns.</li> </ul>
<p><b>Land Use Forecast (allocation): What is the economic viability of the projected greenfield and infill growth?</b></p>	<ul style="list-style-type: none"> <li>• Inventory adopted and proposed land use plans in the region.</li> <li>• Analyze the effect of more greenfield versus more infill growth, and vice versa, on transportation system performance.</li> <li>• Analyze recent market performance for greenfield and infill, residential and non-residential development.</li> <li>• Determine if and how the estimated growth in Center/Corridor, Established, Developing, and Rural Residential Community Types should be changed or refined.</li> </ul>
<p><b>Plan Effects: Follow through on the implementation commitments of the 2012 MTP/SCS to better measure the effects of the plan on different people and issue areas.</b></p>	<ul style="list-style-type: none"> <li>• Track travel behavior, land development pattern, demographic, air quality and transportation project delivery trends to better understand how the MTP/SCS is being implemented over time.</li> <li>• Develop additional performance metrics to assess the impact of the MTP/SCS on different groups of people and issues (e.g. environmental justice communities; health; access to jobs, services, and affordable housing).</li> <li>• Develop decision-making support tools to support regional and local decision-making.</li> <li>• Research the effect of our growing region on the agricultural economy and open space.</li> </ul>



Because the policy framework has an implementation focus, keeping the horizon year's employment, population, and housing projections unchanged from the 2012 MTP/SCS and extending the horizon year only to 2036 is part of that strategy. Along with the policy framework, in December of 2013 the SACOG board adopted this approach after vetting it and the idea of the implementation-focused plan with member agency planning staff and stakeholders. More information on the regional growth projections can be found in Chapter 3, Chapter 5, and Appendix D-1 – Regional Projections. The Policy Framework can be found in Appendix G-1 – Frameworks for the 2016 MTP/SCS Update Process.

Though the policy framework is focused on implementation themes, the 2016 MTP/SCS is still rooted in the board-adopted MTP/SCS principles of access and mobility, equity and choice, economic vitality, environmental quality and sustainability, financial stewardship, and smart land use.

### Scenario Development Framework and Analysis

In March 2014, the SACOG Board adopted a framework for developing three regional land use and transportation scenarios for use in public workshops and plan development. This framework set up the approach for creating and analyzing scenarios and included: 1) updating and refining the three land use and transportation scenarios from the 2012 MTP/SCS, 2) analyzing different timing to construction of transportation and land use components, and 3) analyzing different levels and types of transportation revenues.

1. The three land use and transportation scenarios analyzed in the 2012 MTP/SCS varied principally by how much housing and transportation choice they created. They each took into account all fiscal constraint, major market and policy/regulatory influences and represented a reasonable range of possible futures. Mirroring the 2012 MTP/SCS scenarios, the scenarios started with a refresh of the 2012 MTP/SCS as Scenario 2 and then bracketed it with a lower density, high auto investment Scenario 1 and a higher density, high multimodal investment Scenario 3. More information on the land use and transportation scenarios can be found in Appendix G-1 – Frameworks for the 2016 MTP/SCS Update Process and G-2 – Public Workshop Scenarios and Workshop Results.

2. A key component of the policy framework focusing the plan update on implementation was to explore the full potential for a “fix-it-first” investment strategy and to analyze whether there are reasons to alter the construction timing of transportation projects in the plan. Under the scenario framework, SACOG analyzed a number of transportation projects in the 2012 MTP/SCS and met with local agency staff to discuss the results and any potential changes to the timing of certain transportation projects. More information on the analysis of transportation project timing can be found in Chapter 10.
3. Every plan cycle SACOG must refresh its revenue assumptions, consistent with federal requirements. To address this part of the scenario framework, SACOG first focused on analysis of the 2012 MTP/SCS (i.e. will the region have the same, more or less revenues to build the projects included in the 2012 MTP/SCS?). Then, an analysis of the merits and viability of potential new revenue sources was completed. New revenue sources researched included state cap and trade revenue, new local transportation sales taxes, and statewide vehicle registration fees. More information on the revenue analysis can be found in Chapter 4 and Appendix B-1 – Financial Plan.

The scenarios and information developed in this process were used to illustrate trade-offs and effects of different development patterns and transportation investments compared to the 2012 MTP/SCS. They informed discussions of the Board, stakeholders, member and partner agencies, and public workshop participants on policy issues of the plan update. The scenarios were also used as alternatives for the environmental impact report and as the basis for making necessary refinements to Scenario 2 (the 2012 MTP/SCS) to create a preferred scenario for the 2016 MTP/SCS. More detailed information on the scenario framework and the public workshops can be found in Appendix G-1- Frameworks for the 2016 MTP/SCS Update Process and G-2 – Public Workshop Scenarios and Workshop Results.

### Framework for a Draft Preferred Scenario

In December 2014, the SACOG Board adopted a framework for developing a draft preferred scenario. The framework was built upon the results of the research, analysis and outreach conducted throughout the planning process and was designed to identify necessary changes to the current plan that would allow the updated plan to align with the Board's implementation themes and meet state and federal regulatory requirements. The framework provided policy and process guidance to staff, local agencies and stakeholders for creating a Draft Preferred Scenario that included:

- As much or slightly more growth in infill areas, and, correspondingly slightly less growth in green-field areas as the 2012 MTP/SCS;
- As much or slightly more growth in small-lot single-family and attached housing as in Scenario 2, but not as much as in Scenario 3;
- As much or slightly more improvement in sub-regional jobs-housing balance as in the 2012 MTP/SCS;
- Continued monitoring of the market and regulatory/policy factors that could influence the pace, location, and shape of growth in the region;
- A revenue forecast that fulfills federal requirements and is based on the best information that can be researched and analyzed;
- Researching new and innovative funding sources that are reasonable to assume for the plan;
- A transportation budget that increases the fix-it-first funding commitment;
- Optimizing the performance of the project list through strategic changes in project phasing;
- Continued development of transportation project-level performance evaluation methods and provide the Board a proposed strategy for incorporating such method(s) into SACOG planning and programming activities.

The full Framework for a Draft Preferred Scenario that was adopted by the board can be found in Appendix G-1 – Frameworks for the 2016 MTP/SCS Update Process.

### Preferred Scenario

In April 2015, the SACOG Board of Directors endorsed a Preferred Scenario, comprised of a land use forecast, revenue forecast, transportation projects and programs, and performance outcomes, and consistent with the guidance from the framework discussed above.

Additionally, the Preferred Scenario meets the key policy and regulatory requirements of the plan, including:

- Land Use Forecast: The land use forecast must be based on the most recent information about regulatory, policy and market conditions and a reasonable economic growth forecast of employment, population and housing. It must identify general location of uses, residential densities and building intensities, and areas within the region sufficient to house all of the projected population of the region.
- Revenue Forecast: The MTP/SCS must constrain its budget by assuming only revenues that can reasonably be expected over the planning period. This is a financial constraint test.
- Balance revenues and expenditures over the planning period: Projects must be scheduled to match the pace at which revenues are available to pay for them, proportionally over 20 years, which limits the number of projects that can be planned for any given year and forces decisions about relative priority. This is a financial constraint test.
- Performance Outcomes: For several plan cycles SACOG has evaluated land use and transportation scenarios with a number of performance outcomes. Many of these are helpful to determining if a scenario is achieving policy goals of the plan. Others measure the coBenefits of the MTP/SCS. Two performance outcomes are important for the added reason that they are required under federal and state law:
  - Support attainment of air quality standards: The MTP/SCS must be analyzed as an overall package via technical modeling 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 is the air quality conformity test.
  - Achieve regional greenhouse gas emissions reduction targets set by the California Air Resources Board (CARB): The MTP/SCS must demonstrate a reduction in GHG emissions via technical modeling of the forecasted land use pattern and supporting transportation network designed to serve the regional transportation needs. This is the SB 375 test.

## Who Was Involved in the Plan Development?

As noted earlier, in addition to the SACOG Board and board committees, the plan was informed by advisory committees, local agencies, residents, and public and private sector stakeholders during all stages of development.

### Member Agencies

Early in the 2016 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 and transportation assumptions. At these kick-off meetings, SACOG also vetted the idea of an implementation-focused approach and re-using the 2012 MTP/SCS growth projections that are discussed in the “2016 Policy Framework” section earlier in this chapter. Throughout the 2016 MTP/SCS update process, the SACOG Planners Committee<sup>1</sup> and Regional Planning Partnership<sup>2</sup> were the primary venue for regular coordination between local agency planning staff and SACOG. Throughout the plan update, both committees met monthly or as needed and received regular updates regarding the 2016 MTP/SCS development. A number of jurisdiction-specific meetings

1 A 28-member committee consisting of the planning director, or designee, from each of SACOG’s member jurisdictions. The committee was originally formed to advise SACOG on the development of the Sacramento Region Blueprint and is now advising on all land use related items. This committee meets monthly (or as needed). The Planners Committee is open to the public, and noticed on the SACOG website.

2 A committee with close to 100 representatives from local, regional, state, federal agencies, and tribal governments, as well as representatives of business, environmental, and minority organizations and associations. The Partnership assists SACOG with its transportation and air quality planning responsibilities. It also serves as the primary forum for interagency and public consultation requirements of federal transportation and air quality regulations. This committee meets monthly (or as needed). The Regional Planning Partnership meetings are open to the public, and noticed on the SACOG website.

and correspondence were conducted on an as-needed basis. Additionally, more formal comment periods corresponding to the planning process described earlier in this chapter were held specifically for member jurisdiction comment and feedback. These included:

- A vetting of the 2012 existing land use conditions in Summer 2013;
- A vetting of the land use build out inventory in Winter 2013;
- A call for transportation projects for consideration in the plan (including project scope, cost, and timing) in Fall 2013;
- A vetting of the transportation and land use scenarios in Summer 2014;
- and a vetting of a Discussion Draft Preferred Transportation and Land Use Scenario in Winter 2015.

### Technical Analysis & Congestion Management Process

As part of the 2016 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 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 and scenario evaluation process 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 pattern was based on population growth estimates through 2036.

At the 2014 public workshops, SACOG provided



results of three transportation project investment and forecasted land use scenarios and a comprehensive list of CMP performance measurements. These measures, consistently reported across the scenarios, included percentage of travel by mode, vehicle miles traveled per person, percent of vehicle miles traveled 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 2016 MTP/SCS development led to a project list that was more financially constrained than in the 2012 MTP/SCS, with consistent performance measures to track through ongoing CMP efforts. In 2013, SACOG staff initiated a call for local projects. Local agency plans were reviewed by SACOG staff in early 2014 for the purpose of studying and developing plan alternatives, and again in late 2014, 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 included 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 2012 MTP/SCS. The result was a draft staff recommendation that reflects strong performance, financial realities, and an emphasis on transportation system maintenance.

SACOG provided the technical analysis for the plan, prepared materials for the 2016 MTP/SCS workshops, met with interest groups and the public, and in the end developed the draft 2016 MTP/SCS for the SACOG board. The staff also prepared:

- Financial forecasts of amounts and types of funds expected to be available between 2012 and 2036.

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, SACSIM, 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.

### Public Involvement

In 2013, before beginning the 2016 MTP/SCS development process, and in compliance with federal and state requirements the SACOG Board of Directors adopted a Public Participation Plan (PPP) as a guide to effective public involvement. The PPP provides direction for the required public involvement activities to be conducted by SACOG. The full PPP is in Appendix G-5 - Public Participation Plan. Building on the PPP the SACOG developed a detailed Outreach and Communications plan, which included goals and strategies that extended beyond state and federal requirements. Specifically, more detailed strategies were developed to engage a broad spectrum of residents, with attention to hard-to-reach communities, and residents in rural areas. The Outreach and Communications plan was designed as a working document that could be enhanced throughout the planning process. The Outreach and Communications Plan can be found in Appendix G-6 – Outreach and Communications Plan.

### Sounding Board

In addition to the required outreach conducted as directed by the Public Participation Plan, the SACOG Board directed staff to implement a strategy to engage a range of public and private stakeholder interests throughout the 2016 MTP/SCS planning Process. In response, staff began the development and engagement of the Sounding Board. The purpose of the



Sounding Board was to provide feedback to the board and staff on research topics, policy considerations, plan implementation themes, and other 2016 MTP/SCS topics and issues as they arise. The Sounding Board met quarterly starting in October 2013. Meeting summaries, and participant comments were presented at all SACOG Board Policy Committees for consideration.

The regular cross-sector engagement and feedback of the Sounding Board were beneficial to representing the issues and interests of a broad range of stakeholders - especially the traditionally underrepresented communities throughout the planning process. The Sounding Board played a critical role in informing the presentation format, location selection approach, and outreach partners for the MTP/SCS public workshops. The Sounding Board also played a key advisory role in the methodology for the Environmental Justice analysis.

In building the Sounding Board stakeholder list, special care was taken to ensure that the interests from suburban, urban, rural, and disadvantaged communities were represented. The stakeholder list is comprised of executive and senior level staff from the following sectors:

- Environmental Advocates
- Public Health & Human Services
- Water/Sanitation Services
- Energy
- Agriculture
- Philanthropy/Foundations
- Pre-Kindergarten - 12 Education
- Faith & Community-Based Organizations
- Senior/Aging
- Goods Movement & Freight
- Higher Education
- Market Rate Housing Developers
- Affordable Housing Advocates/Developers
- Regional, Local and Ethnic Chambers

- Service Providers for Seniors/Aging
- Service Providers for the Disabled
- Health Care Providers
- Rural Communities
- Transit Advocates
- Active Transportation Advocates
- Food Banks/Food Access
- Parks and Recreation Services
- CBOs Working with Low-income and/or Minority Residents
- Law Enforcement
- Fire Departments
- Commercial Real Estate Brokers

Meeting summaries and participant evaluations were provided in staff reports to all SACOG Board Policy Committees. The meeting summaries for all of the Sounding Board meetings can be found in Appendix G-4 – Sounding Board Meeting Summaries.

#### **Native American Tribal Government Outreach**

As referenced above, the PPP guides public participation and set the framework for Native American Tribal Government outreach 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 2014 public workshops, SACOG reached out to the federally designated Native American tribal governments within the region. SACOG's intention was to meet the federal requirements for tribal government outreach and to provide early and frequent opportunity to discuss and provide input on the 2016 MTP/SCS.

SACOG reached out to representatives of the Yocha Dehe Wintun Nation, United Auburn Indian Community, Shingle Springs Band of Miwok Indians, and Wilton Rancheria regularly beginning in early 2014. Only the tribal governments from the United Auburn Indian Community and Wilton Rancheria elected to engage

with SACOG staff regarding the development of the 2016 MTP/SCS. Uniquely, the United Auburn Indian Community works with Placer County Transportation Planning Agency within Placer County, and the Shingle Springs Band of Miwok Indians works with El Dorado County Transportation Commission within El Dorado County on local transportation plans and investments that are incorporated into the regional plan.

### **MTP/SCS Public Workshops**

State requirements and federal guidance require at least eight public workshops be held throughout the region as part of the MTP/SCS planning process. In order to expand participation in the public workshops for the 2016 MTP/SCS, SACOG staff collaborated with jurisdiction staff and community groups to hold workshops in locations frequented by local residents, and to the extent possible, accessible by transit. For the workshops in El Dorado and Placer counties, staff worked with the El Dorado County Transportation Commission and Placer County Transportation Planning Agency to identify ideal locations and customize the workshop content.

At the nine county-level workshops in October and November of 2014, attendees participated in self-directed workshops that allowed for one-on-one and small group conversations with members of the SACOG Board of Directors, SACOG staff, and other workshop participants. The public workshops were designed with a “drop in” format allowing for participants to arrive and depart at their convenience. The workshops had seven main interaction points:

1. Planning for the Future: What is an MTP/SCS and What Does it Do?
2. Follow the Money: Where Do We Get Our Money for the Transportation System?
3. Balancing Priorities: Investing in Transportation Choices.
4. More Choices: Our Diverse Communities.
5. More Choices: The Transportation System We Build and How We Grow Affects Our Region.
6. Interactive Transportation Project Mapping Center
7. Workshop Survey

The primary purpose of the workshops was to get public participation in the workshop survey, which focused largely soliciting from respondents their biggest trans-

portation challenges today and the plan performance outcomes most important to them. Points 1 through 6, listed above, were described and illustrated on large posters that participants could review at their own pace and priority and with or without SACOG assistance. The materials were largely informed by the scenarios and analysis referenced in the “Scenario Development Framework and Analysis” section earlier in this chapter. The purpose of the materials was to help inform participants about the plan so they could make more informed decisions about their personal priorities when taking the survey. In general participants identified increased funding for the existing road and highway system, reducing congestion, reducing greenhouse gas emissions, and having more transit, walking, and biking options, as priorities.

Renderings of the MTP/SCS in-person and online workshop materials, as well as the full workshop results, are available in Appendix G-2 – Public Workshop Scenarios and Workshop Results.

### **MTP/SCS Online Public Workshops**

In addition to the public workshops required by federal and state statute, an online workshop and survey were made available. The use of a web-based option allowed for a broader geographic reach of participants. The online workshop replicated the in-person workshop content and survey questions in an easy-to-navigate format. There were 187 online surveys completed with 347 unique visits to the online workshop website.



### **Public Opinion Polling**

A scientific public opinion telephone poll was conducted to provide the SACOG Board with scientifically valid public perspectives on the region's transportation system and the policy themes for the plan update. This public opinion poll was part of the expanded outreach and communications, beyond what is required in the Public Participation Plan.

Conducted in October, the telephone poll was comprised of 1,600 regional respondents. Almost 200 interviews were completed each in El Dorado, Placer, Sutter, Yolo and Yuba counties. Approximately 600 interviews were completed within Sacramento County, and distribution was roughly proportionate to populations in the City of Sacramento, the unincorporated areas of Sacramento County, and the other incorporated areas within the county. The telephone poll was considered scientifically valid and was reviewed and considered by the SACOG Board of Directors in conjunction with the online and in-person workshop survey results. The full report on the phone poll results can be found in Appendix G-3 – Public Opinion Poll Report.

All of the public workshop and phone results informed the SACOG Board's direction in developing the framework for Draft Preferred Scenario for the 2016 MTP/SCS.

**In addition to the SACOG Board and board committees, the plan was informed by advisory committees, local agencies, residents, and public and private sector stakeholders during all stages of development.**

### **Elected Official Information Meetings**

In accordance with Senate Bill 375, SACOG hosted Elected Official Meeting in each county of the SACOG region. The purpose of these meetings was to provide city and county elected officials who may not sit on the SACOG Board ample opportunity to provide input on the MTP/SCS, and gain better understanding of how the MTP/SCS builds off of existing local plans (e.g., capital improvements programs and general plans). While the statute identifies local elected officials as the target audience, SACOG staff conducted specific outreach for the meetings to include city managers, county administrators, and jurisdiction staff working on the 2016 MTP/SCS. In addition to the required meetings per county, staff offered additional meetings at the request of board members.

### **Additional Outreach**

In addition to regular meetings of the Sounding Board, SACOG staff participated in over 90 stakeholder meetings to share information and encourage participation from a broad range of residents, advocates, jurisdiction staff and other stakeholders in the region. Development of the 2016 MTP/SCS includes public hearings during circulation of the draft 2016 MTP/SCS that satisfy the public outreach requirements of SB 375 and SACOG's PPP.



## 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 2016 MTP/SCS is also consistent with other plans and regulations. Detailed descriptions of the following plans and regulations are found in Appendix G-7 – Regulatory Framework for the MTP/SCS:

- 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 California Transportation Plan (CTP) provides a long-range policy framework to meet the state's mobility needs and reduce greenhouse gas emissions. The CTP defines goals, performance based policies, and strategies to achieve the state's collective vision for California's future statewide, integrated, multimodal transportation system.
- 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 date 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) and CHSTP recommendations consistent with the environmental justice analysis described in Chapter 8 – Equity and Choice.
- The plan includes access to interregional transportation, such as Amtrak stations, freight rail yards, airports, and the Port of West Sacramento, but does not include planning for those systems, which are owned and operated by other entities.
- 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 and Choice.

## CHAPTER 3

# Summary of Growth and Land Use Forecast

## Introduction

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 /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 (2012 to 2036). 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/SCS update cycle. In the 2012 MTP/SCS cycle, the Center for Continuing Study of the California Economy (CCSCE) developed 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.

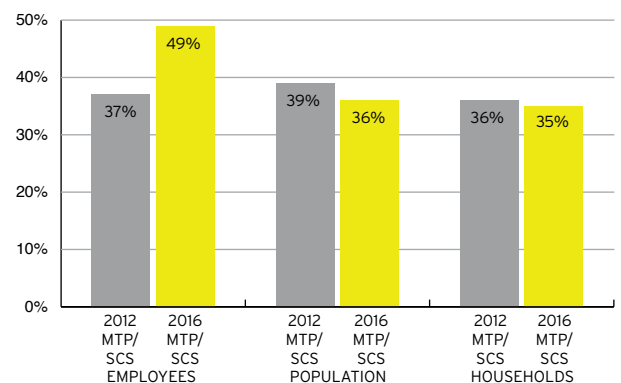
For this plan, SACOG conducted a minor refinement of the growth projections used in the 2012 MTP/SCS based on an assessment of the long-term economic trends for the region.

The growth projections were vetted with economic, demographic and housing market forecasters in the private and public sectors, all of whom concluded that SACOG's projections were within a range of reasonableness and that many of the assumptions were consistent with their own. While the Great Recession had some short-term effects on regional employment, housing and population growth, long-term regional economic growth is expected to continue to be faster than that of the state as a whole. More detail on the SACOG growth projections can be found in Appendix D - Regional Projections.

The 2036 growth forecast indicates that population in the plan area is expected to grow by 811,000 people, an increase of about 36 percent, between 2012 and 2036. As shown in Figure 3.1 below, this forecast is lower than the 871,000 people forecasted in the 2012 MTP/SCS, which had a 2035 planning horizon but used 2008 as the base year. Figure 3.1 also shows a housing forecast for the region of 285,000 new homes from 2012 to 2036, compared to the 303,000 new housing units forecast in the last plan from 2008 to 2035. Although the total population and housing forecast by 2036 is the same total as forecast in the previous 2012 MTP/SCS by 2035, the growth in people and homes is

slightly lower in this plan due to the passage of time and the new 2012 base year for this plan. Alternatively, while the total employment forecast for 2036 is also the same total employment forecast by 2035 in the previous 2012 MTP/SCS, the employment growth in this MTP/SCS is much higher. This is a result of the Great Recession. From 2008 to 2012, the region, like most of the nation, experienced significant job loss. The projected regional job growth from 2012 to 2036 accounts for both the recovery of jobs lost during the recession and addition of new jobs. As shown in Figure 3.1 below, the growth projections include approximately 439,000 new employees from 2012 to 2036, as compared to the 361,000 new employees forecasted in the last plan from 2008 to 2035. Today in 2015, the region is showing significant signs of economic recovery and job growth is leading housing growth. In fact, much of the employment lost from 2008 to 2012 has been recouped in the region.<sup>1</sup> Chapter 9: Economic Vitality has more detailed information on the employment forecast.

**FIGURE 3.1**  
**SACOG Region Growth Rates**



<sup>1</sup> CA Employment Development Department reports approximately 968,000 non-farm jobs in the region in 2008 and almost 924,000 in 2014.

While the MTP/SCS is centered on a planning period of 2012 to 2036, 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.<sup>2</sup>

Although the long-term economic trends for the region haven't changed significantly since the last MTP/SCS, the short-term economic trends have had a bigger impact on the interim year growth projections for 2020. SACOG revisited the 2020 growth projections with particular attention to the pace of recovery from the recession. The revised 2020 projections include significantly less housing and slightly higher employment than the 2012 MTP/SCS projections assumed by 2020. The revised projections are based on observed data that while the region is recovering as a whole, the housing recovery is happening at a much slower rate than the employment recovery. As with the 2036 growth projections, the 2020 projections were vetted with six industry experts, all of whom concluded that SACOG's projections were within a range of reasonableness. Appendix D-1 - Regional Projections has more information on the 2020 growth projections and the results of the vetting process. Table 3.1, below, shows the regional growth forecast for the MTP/SCS for 2020 and 2036.

TABLE 3.1

**MTP/SCS Regional Growth Forecast**

Year	Employees	Population	Housing Units
2012	887,965	2,268,138	903,451
2020	1,033,297	2,472,567	951,495
2036	1,327,323	3,078,772	1,188,347

## 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.<sup>3</sup> 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,

<sup>2</sup> The SIP also requires that SACOG prepare growth estimates, projected land use patterns, travel behavior and air emissions for what are termed horizon years. Chapter 7: Environmental Sustainability and Appendix G-7 - Regulatory Framework for the MTP/SCS, provide more information on the State Implementation Plan.

<sup>3</sup> 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.



and enable the CEQA streamlining benefits for projects that are consistent with the SCS.

Additionally, the 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 2036 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 including board direction and a series of public workshops, and a more technical process that included a 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-2 – Public Workshop Scenarios and Workshop Results provide detailed information on the alternative scenarios analyzed, the input gathered during a series of public workshops held in October 2014, and the subsequent framework for creating the MTP/SCS Preferred Transportation and Land Use Scenario that was adopted by the SACOG board in December 2014. Some of the most important parts of the framework related to land use 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. The framework established that these targets should at a minimum meet the targets of the 2012 MTP/SCS and where possible incrementally try and shift more of the new growth into the infill areas (Center and Corridor Communities and Established Communities). More information on the regulatory and market factor

research and the preferred scenario framework can be found in Appendix E-3 – Land Use Forecast Background Documentation.

The first step in the transition from the growth projections 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<sup>4</sup> 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 winter 2013, at the launch of the MTP/SCS update, SACOG staff met with each jurisdiction individually to discuss the update process and to collect new and/or updated planning

4 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.

assumptions. Staff also discussed the upcoming planning process and worked to keep local government staff informed of key dates, milestones, and comment periods in the planning process. Throughout the process of developing the land use forecast (from Summer 2013 to April 2015), SACOG had four 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 – Frameworks for the 2016 MTP/SCS Update Process, and Appendix E-3 – Land Use Forecast Background Documentation 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 2036. 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 – Land Use Forecast Background Documentation.

### 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 planned 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 (2012 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 2036. 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 2036, 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 2036. And sometimes, local jurisdictions will amend and re-entitle existing plans to respond to changing market demand.

After creating and vetting the 2036 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 2036. 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 the 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 February 2020) 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 likely begin preparing the updated growth forecast for the next plan in 2018.

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 811,000 people, 285,000 new housing units and 485,000 new employees in the region through the year 2036, the MTP/SCS projects the development of an additional 47,563 acres of land. Importantly, the plan accommodates a 36 percent increase in population in the region on only a seven percent increase in the development footprint of the region from 2012 to 2036, or less than two 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 2012 base year (or existing conditions) and the 2020 and 2036 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, suburban or urban commercial corridors, rail station areas, central business districts, or town centers. They typically have more compact development patterns, a greater mix of uses, and a wider variety of transportation infrastructure compared to the communities surrounding them.



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. Many are characterized as “first tier,” “inner ring,” or mature suburban 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 2012 and in 2036.

#### **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 are nevertheless consistent with the Blueprint.

Though the MTP/SCS does not assume any development in these areas by 2036, 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.



### 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 2036. 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	2012 Existing Housing Units	Total 2036 Forecasted Housing Units
Center and Corridor Communities	107,718	193,885
Established Communities	686,075	764,825
Developing Communities	31,422	146,258
Rural Residential Communities	78,237	83,380
<b>Region Total</b>	<b>903,451</b>	<b>1,188,347</b>

TABLE 3.3

### Summary of Employment Forecasted in MTP/SCS<sup>1</sup>

Community Type	Center and Corridor	Established	Developing	Rural Residential	Region Total
2012 Retail Employees	92,444	144,159	6,622	13,503	256,728
<b>2036 Retail Employees</b>	<b>120,273</b>	<b>172,443</b>	<b>28,062</b>	<b>14,312</b>	<b>335,090</b>
2012 Office Employees	150,150	202,231	3,692	5,853	361,926
<b>2036 Office Employees</b>	<b>267,955</b>	<b>354,393</b>	<b>38,467</b>	<b>7,278</b>	<b>668,094</b>
2012 Industrial Employees	24,347	93,339	5,603	6,778	130,067
<b>2036 Industrial Employees</b>	<b>24,977</b>	<b>112,633</b>	<b>7,858</b>	<b>7,728</b>	<b>153,196</b>
2012 Public Employees	35,833	51,742	2,718	2,978	93,272
<b>2036 Public Employees</b>	<b>41,667</b>	<b>66,440</b>	<b>13,132</b>	<b>3,053</b>	<b>124,292</b>

1 Does not include employees of home-based businesses.

### **Center and Corridor Communities**

In 2012, 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/SCS land use elements, the land use allocation for this 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 2036, 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 12 percent in 2012 to 16 percent in 2036, primarily on vacant or underutilized land in close proximity to services and employment opportunities. By 2036, the MTP/SCS land use forecast projects that 30 percent of new housing and 35 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 1981 and 1999), 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 1,573 average annual dwelling units between 2012 and 2020 is only about half of the 3,066 average annual dwelling units between 2021 and 2036. Housing growth projections through 2020 represent 17 percent of total projected housing growth through 2036 region-wide, with 26 percent of projected housing growth through 2036 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 lack of redevelopment funds. In some cases, existing infrastructure capacity is not sufficient, and financing improvements can be challenging due to the multiple owners typically found in fine-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, including a number of new infill and redevelopment projects in downtown Sacramento, 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.

Table 3.4 summarizes the existing conditions, and 2020 and 2036 MTP/SCS projections, for Center and Corridor Communities.



TABLE 3.4

**Summary of Housing Units and Employees in Center and Corridor Communities**

Existing Conditions 2012	2012-2020	2012-2036
Total Employees	Employee Growth	Employee Growth
<b>307,652</b>	<b>57,622</b>	<b>152,097</b>
Total Housing Units	Housing Unit Growth	Housing Unit Growth
<b>107,718</b>	<b>12,580</b>	<b>86,167</b>

**Established Communities**

In 2012, 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 76 percent in 2012 to 64 percent by 2036. This growth represents about 3,280 new units per year. The early part of the plan, through 2020, has a higher growth rate than Center and Corridor Communities, 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 in the near term.

The MTP/SCS projects a 41 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 2036.

In general, the MTP/SCS projects smaller changes to residential communities in Established Communities

than in other Community Types. Many of these communities are mature or newer suburbs. 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 in mature suburbs 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.

Table 3.5 summarizes the existing conditions and 2020 and 2036 MTP/SCS projections for Established Communities.

TABLE 3.5

### Summary of Housing Units and Employees in Established Communities

Existing Conditions 2012	2012-2020	2008-2036
Total Employees	Employee Growth	Employee Growth
<b>527,095</b>	<b>72,113</b>	<b>215,116</b>
Total Housing Units	Housing Unit Growth	Housing Unit Growth
<b>686,075</b>	<b>16,379</b>	<b>78,750</b>

#### 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 2012, 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 2036, Developing Communities will be fully or partially constructed.

The MTP/SCS projects that 40 percent of the forecasted housing demand and 16 percent of the employment demand will be in Developing Communities. This will bring the share of housing in Developing Communities up from three percent in 2012 to 12 percent of the total regional housing pool in 2036. Employment in Developing Communities experiences a smaller gain in the regional share of employees as it goes from two percent in 2012 to seven percent of the total employees in the region by 2036. 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 southwest 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 seven percent residential vacancy rate and existing resale stock provide 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.

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.

Table 3.6 summarizes the existing conditions and 2020 and 2036 MTP/SCS projections for Developing Communities.

TABLE 3.6

### Summary of Housing Units and Employees in Developing Communities

Existing Conditions 2012	2012-2020	2012-2036
Total Employees	Employee Growth	Employee Growth
<b>20,037</b>	<b>14,733</b>	<b>68,885</b>
Total Housing Units	Housing Unit Growth	Housing Unit Growth
<b>31,422</b>	<b>17,536</b>	<b>114,836</b>

**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 two percent of the projected housing demand, and one 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 2036 would actually decrease from almost nine percent to seven 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 landowner.

Table 3.7 summarizes the existing conditions and 2020 and 2036 MTP/SCS projections for Rural Residential Communities.

TABLE 3.7

**Summary of Housing Units and Employees in Rural Residential Communities**

Existing Conditions 2012	2012-2020	2012-2036
Total Employees	Employee Growth	Employee Growth
<b>33,181</b>	<b>864</b>	<b>3,260</b>
Total Housing Units	Housing Unit Growth	Housing Unit Growth
<b>78,237</b>	<b>1,533</b>	<b>5,143</b>



## 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 MTP/SCS land use forecast: the distribution of new development acres through 2036 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/SCS 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.

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 Appendix E-1 – Blueprint Special Report.

### 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.<sup>5</sup>

### 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.

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 one 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.<sup>6</sup> 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 in 2011 and then updated it in 2014. Please see Appendix E-3 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 2009-2013 reports that, in the region, approximately 94 percent

5 (Brett, 2011)

6 Sacramento Area Council of Governments, “Changing Demographics and Demand for Housing Types,” January 2011. p. 2-3.

of owner-occupied units are detached units, while 62 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 3.3, provides a mix of housing options that focuses on improving the current relative shortages of attached and small-lot products.

Regionally, 45 percent of the new housing in the MTP/SCS is attached, 25 percent is small-lot single-family, 28 percent large-lot single-family, and two 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 2036 time period than in the 2012 to 2020 time period.

By 2036, 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 3.8 and 3.9.

**FIGURE 3.3**  
**Summary of Housing Product Mix**

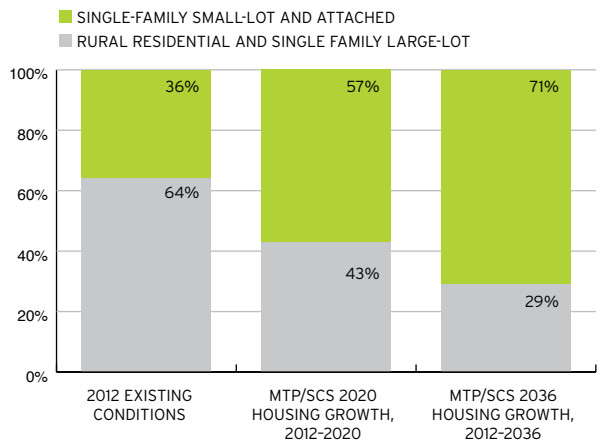


TABLE 3.8

**Summary of Housing Product Distribution  
by Community Type for 2012-2020 and 2012-2036 Growth**

Community Type	Center and Corridor	Established	Developing	Rural Residential
2012-2020 Rural Residential	0%	0%	1%	16%
<b>2012-2036 Rural Residential</b>	<b>0%</b>	<b>1%</b>	<b>1%</b>	<b>38%</b>
2012-2020 Large-Lot Single-Family	3%	46%	63%	67%
<b>2012-2036 Large-Lot Single-Family</b>	<b>2%</b>	<b>32%</b>	<b>42%</b>	<b>49%</b>
2012-2020 Small-Lot Single-Family	25%	30%	19%	5%
<b>2012-2036 Small-Lot Single-Family</b>	<b>15%</b>	<b>34%</b>	<b>29%</b>	<b>8%</b>
2012-2020 Attached	72%	23%	17%	11%
<b>2012-2036 Attached</b>	<b>83%</b>	<b>32%</b>	<b>28%</b>	<b>5%</b>

TABLE 3.9

**Summary of Housing Product Distribution by Community Type for 2012-2020  
and 2021-2036 Growth**

Community Type	Center and Corridor	Established	Developing	Rural Residential
2012-2020 Rural Residential	0%	0%	1%	16%
<b>2021-2036 Rural Residential</b>	<b>0%</b>	<b>2%</b>	<b>1%</b>	<b>47%</b>
2012-2020 Large-Lot Single-Family	3%	46%	63%	67%
<b>2021-2036 Large-Lot Single-Family</b>	<b>2%</b>	<b>29%</b>	<b>39%</b>	<b>41%</b>
2012-2020 Small-Lot Single-Family	25%	30%	19%	5%
<b>2021-2036 Small-Lot Single-Family</b>	<b>13%</b>	<b>35%</b>	<b>30%</b>	<b>9%</b>
2012-2020 Attached	72%	23%	17%	11%
<b>2021-2036 Attached</b>	<b>85%</b>	<b>35%</b>	<b>30%</b>	<b>2%</b>

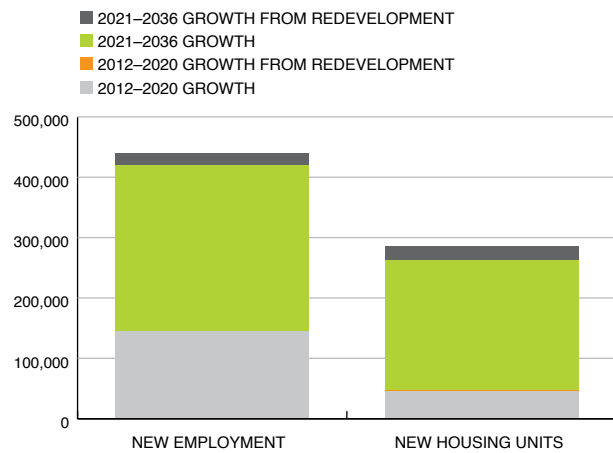
**Use Existing Assets**

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, 88 percent of the region’s housing is located in Center and Corridor Communities and Established Communities. These two Community Type areas are also where 94 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 35 percent of new jobs will occur in Centers and Corridors; 28 percent of new homes and 49 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 2036, six percent of new housing and five 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 2036, the majority of it is expected to occur in the latter half of the planning period. As shown in Figure 3.4, approximately seven percent of the new housing units and one percent of the new jobs that occur through re-investment are projected by 2020, with the remaining projected between 2021 and 2036. 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 ten percent of new jobs by 2050 to occur through reinvestment.

FIGURE 3.4

**Housing and Employment Growth through Re-Investment**



**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. Approximately 43 percent of the newly developed land is located in Established Communities and Center and Corridor Communities. Another 47 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 3.10, the MTP/SCS land use pattern accommodates a 36 percent population increase with only an additional seven percent of land developed (47,563 acres).



TABLE 3.10

**Summary of Expected Developed Acres by Community Type<sup>1</sup>**

Community Type	Center and Corridor	Established	Developing	Rural Residential	Region Total <sup>2</sup>
2012 Existing Developed Acres	26,684	264,242	23,793	403,637	718,356
Percent Distribution	4%	37%	3%	56%	100%
<b>2012-2036</b>					
Additional Developed Acres	3,825	16,619	22,153	4,966	47,563
Percent Distribution	8%	35%	47%	10%	100%
<b>2036</b>					
All Developed Acres	30,509	280,861	45,946	408,602	765,919
Percent Distribution	4%	37%	6%	53%	100%
<b>Developed and Undeveloped</b>					
All Acres	36,821	1,287,421	105,611	2,433,470	3,863,323
Percent Distribution	1%	33%	3%	63%	100%

1 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).

2 Totals may not match due to rounding.

### 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 – Natural Resource Data 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 2012, the region grew by more than 750,000 people. In that same time, according to Farmland Mapping and Monitoring Program data summaries from the California Department of Conservation, approximately 214,000 acres of grazing and farmland were lost to urban and rural development. 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 37,215 acres of grazing and farmland by 2036, an average of only 0.05 acres of farmland lost for every additional person, nearly a full order of magnitude lower impact than historical growth patterns. Approximately 3,578 acres of vernal pool complexes are affected by 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.

### Mixed Use Developments

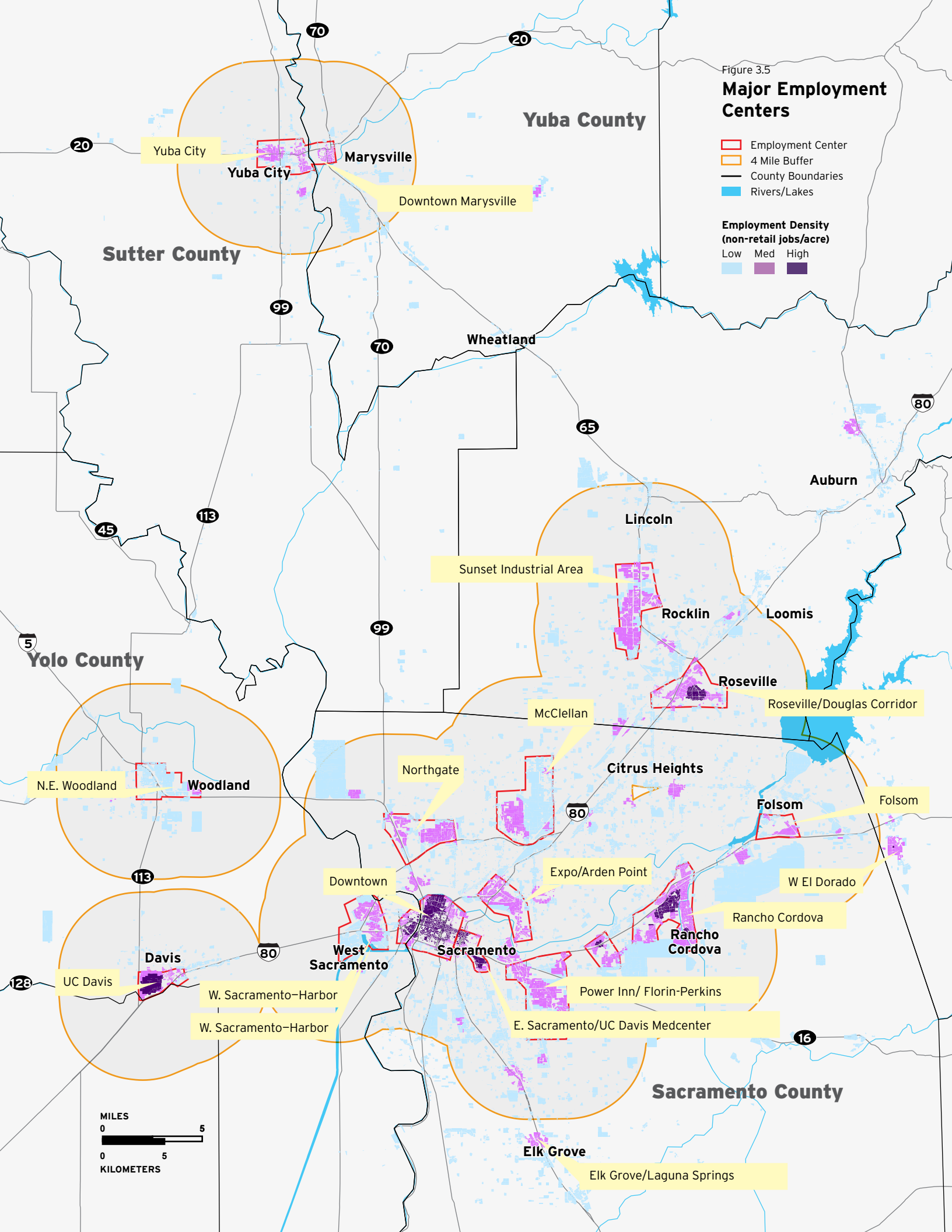
The principle of mixed use developments has different applications at different scales. At smaller scales this could apply to individual vertically mixed use buildings or a neighborhood with a combination of uses in close proximity. Building homes, shops, offices, entertainment, schools, and other uses within walking distance helps create active, vital neighborhoods. A community designed with a good, or balanced, mix of uses helps to encourage walking, biking, shorter driving trips, and transit use where transit is available. At the full regional scale, this principle 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.

Figure 3.5

### Major Employment Centers

- Employment Center
- 4 Mile Buffer
- County Boundaries
- Rivers/Lakes

**Employment Density (non-retail jobs/acre)**  
Low Med High



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 2012 and 2036. 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 3.5 shows these areas.

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.

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, the 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. SACOG continues to work on a “jobs-housing fit” methodology that can better assess the “fit” at a smaller geographic scale between the wages paid to local workers and the cost of housing. Such a method will provide more detailed information for regional and local planning efforts on local employment and housing demand.

#### **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 2036.

### 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 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 2012, 16 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 2036, the MTP/SCS puts 37 percent of new dwelling units and 42 percent of new employees within TPAs. 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 3.11 and 3.12 show the total housing and employment in the TPAs as well as the housing product mix.

TABLE 3.11

**Summary of Expected Housing and Employment within 2036 Transit Priority Areas<sup>1</sup>**

Transit Priority Area (TPA) <sup>1</sup>	Placer TPA	Sacramento TPA	Yolo TPA	All TPAs
2012 Existing Dwelling Units	17,005	281,324	39,562	337,892
2012 Existing Employees	42,732	357,755	48,277	448,764
2012-2036 New Dwelling Units	2,252	83,872	18,900	105,024
2012-2036 New Employees	15,147	135,086	32,961	183,194
2036 Total Dwelling Units	19,257	365,196	58,462	442,915
<b>2036 Total Employees</b>	<b>57,879</b>	<b>492,841</b>	<b>81,238</b>	<b>631,958</b>

<sup>1</sup> 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 (Pub. Resources Code, § 21155).

TABLE 3.12

**Summary of Expected Housing Product Distribution by County (Percent), 2012-2036**

Transit Priority Areas (TPAs) <sup>1</sup>	Rural Residential <sup>2</sup>	Large-Lot Single-Family <sup>3</sup>	Small-Lot Single-Family <sup>4</sup>	Attached <sup>5</sup>
Placer TPAs	0%	4%	19%	76%
Sacramento TPAs	0%	6%	19%	76%
Yolo TPAs	2%	4%	19%	76%
<b>All TPAs</b>	<b>0%</b>	<b>5%</b>	<b>19%</b>	<b>76%</b>

- 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 (Pub. Resources Code, § 21155).
- 2 Rural Residential: single-family detached homes built at densities less than 1 dwelling unit per acre.
- 3 Large-Lot Single-Family: single-family detached homes built at densities between 1 and 8 dwelling units per acre.
- 4 Small-Lot Single-Family: single-family detached homes built at densities between 8 and 25 dwelling units per acre.
- 5 Attached Residential: Single-family or multi-family homes ranging from duplexes, triplexes, apartments, condominiums, townhomes, rowhouses, halfplexes, etc. built at densities from 8 to over 50 dwelling units per acre.

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 2036, 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 case studies of transit-oriented development (TOD) to examine the barriers and opportunities for TOD in the region. This grant work supported analysis to help activate development in five TPA case study areas. The work was 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 included 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 was a partner in this work

and provided 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. In addition, SACOG developed tools to help lead agencies apply the environmental streamlining provisions of SB 375 to qualifying transit-oriented development projects.

## Applications of the SCS

In 2008, 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 over 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 3.13

**SB 375 CEQA Benefits**

Project Designation	Qualifications	Streamlining Benefits
Mixed Use Residential Project	<ul style="list-style-type: none"> <li>• At least 75% of total building square footage for residential use</li> <li>• Consistent with the use designation, density, building intensity, and applicable policies for the project area of an SCS or APS accepted by ARB</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>• A Transit Priority Project as defined below</li> </ul>	<ul style="list-style-type: none"> <li>• 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.</li> </ul>
Transit Priority Project	<ul style="list-style-type: none"> <li>• At least 50% of total building square footage for residential use OR</li> <li>• If 26-50% of total building square footage is non-residential, a minimum FAR of 0.75</li> <li>• Minimum net density of 20 du/acre</li> <li>• 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)</li> <li>• Consistent with the use designation, density, building intensity, and applicable policies of an SCS or APS</li> </ul>	<p>Benefits described above PLUS:</p> <ul style="list-style-type: none"> <li>• Option to review under a “Sustainable Communities Environmental Assessment”                             <ul style="list-style-type: none"> <li>→ An Initial Study is prepared identifying significant or potentially significant impacts.</li> <li>→ Where the lead agency determines that cumulative impacts have been addressed and mitigated in SCS/APS, they will not be “considerable.”</li> <li>→ Off-site alternatives do not need to be addressed.</li> <li>→ Deferential review standard - the burden of proof for legal challenge is on the petitioner/ plaintiff.</li> <li>→ Traffic control/mitigation may be covered by SCS/APS.</li> </ul> </li> </ul>
Sustainable Communities Project	<ul style="list-style-type: none"> <li>• Everything for Transit Priority Project PLUS:</li> <li>• Served by existing utilities</li> <li>• Does not contain wetlands or riparian areas</li> <li>• Does not have significant value as a wildlife habitat and does not harm any protected species</li> <li>• Not on the Cortese List</li> <li>• Not on developed open space</li> <li>• No impacts to historic resources</li> <li>• No risks from hazardous substances</li> <li>• No wildfire, seismic, flood, public health risk</li> <li>• 15% more energy-efficient than CA requirements and 25% more water-efficient than average for community</li> <li>• No more than 8 acres</li> <li>• No more than 200 units</li> <li>• No building greater than 75,000 square feet</li> <li>• No net loss of affordable housing</li> <li>• Compatible with surrounding industrial uses</li> <li>• Within 1/2-mile of rail/ferry or 1/4-mile of high quality bus line</li> <li>• 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</li> </ul>	<p>Exempt from CEQA</p>

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 provides assistance to a local jurisdiction in making this determination if the local jurisdiction requests such assistance.

### **SB 226**

In October 2011, the Governor signed Senate Bill (SB) 226, a bill for streamlining the environmental review process for eligible infill projects (Stats 2011, Ch. 469). In summary, eligible projects include those located in an urban area, consistent with the general land use, density, intensity, and policies of the SCS, and that satisfy the performance standards outlined in the bill. Perform-

mance standards vary by project type and range from project size standards to proximity to transit to project design standards, for example. The full summary of eligibility requirements, including the performance standards can be found in SB 226.

### **SB 743**

Senate Bill (SB) 743 was enacted on in September 2013 (Stats 2013, Ch. 386). The law made several changes to CEQA for projects located in areas served by transit. These changes include creating a new CEQA exemption for certain projects consistent with a specific plan and eliminates the need to analyze aesthetic and parking impacts for certain projects. The bill also directs the Governor's Office of Planning and Research (OPR) to develop a new approach for analyzing the transportation impacts under CEQA. This approach is centered on developing alternatives to level of service. In August 2014, OPR released a preliminary discussion draft of CEQA Guideline changes for public review. As of August 2015, OPR is developing a revised draft for further review and comment. A full summary of CEQA changes made and eligibility requirements can be found in SB 743.

### **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. In 2013, the DSC adopted The Delta Plan, a comprehensive, long-term management plan for the Delta. The plan creates new rules and recommendations to address the coequal goals of providing a more reliable water supply for California and protecting, restoring, and enhancing the Delta ecosystem.

Under the Delta Reform Act, the DSC is charged with reviewing and advising local and regional agencies regarding the consistency of local and regional plan-

ning 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. SACOG has considered the coequal goals of the Act in developing the MTP/SCS and will follow the Delta Reform Act's consultation requirements.

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

## Development of the MTP/SCS Budget and Investments

Each MTP/SCS update cycle, SACOG works with member and partner agencies to develop a list of transportation projects that account for forecasted changes in land use patterns intended to accommodate population, housing, and employment growth over the next two decades. The MTP/SCS will make investments totaling \$35 billion (in 2015 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 2036.

SACOG's Board of Directors provides policy direction that helps define the priorities for projects included in the plan. Chapter 2 provides additional detail on the SACOG board-endorsed implementation themes that drove the development of the MTP/SCS. In terms of transportation investments, the board directed staff to focus on the timing of investments to better align with changes in land use patterns and travel demand, and to take a closer look at prioritizing road maintenance and rehabilitation needs. Chapter 5 provides more details on the technical work that SACOG conducted with transportation planning partners to help realize the board's objectives for a high performing and cost effective plan that focuses on maintaining and preserving existing assets.

The specific projects making up the investments are the product of months of technical and financial analysis, and coordination with cities, counties, transit agencies, Caltrans, the El Dorado County Transportation Commission, and Placer County Transportation Planning Agency. SACOG consults with local governments and stakeholders as it considers the levels and types of investments made in the MTP/SCS. The SACOG Regional Planning Partnership advisory committee was the primary venue for ongoing coordination between local agency transportation planning staff and SACOG; however, SACOG also held a number of jurisdiction-specific meetings and comment periods. Beginning in the winter of 2013 SACOG staff issued a call for project updates and met with each jurisdiction individually to discuss the plan update process and to collect new and/or updated transportation project information. Local agencies were also informed of key dates, milestones, and comment periods through regular updates at the Regional Planning Partnership and Transit Coordinat-

ing Committee. Throughout the process of developing the package of transportation investments and budget (from Summer 2013 to April 2015), SACOG held several review periods to build and refine the final set of projects included in the plan.

All of the expenditures planned for in the MTP/SCS must be financially constrained to the revenues that the region can reasonably expect to be available during the planning period. To this end, SACOG developed a set of financial projections, relying on the latest data, forecasts, and policy direction from local, state, and federal sources to help guide future transportation investments. The financial projections supporting the investments in the MTP/SCS consider trends in the economy, policy and regulatory frameworks, fuel prices and consumption patterns, and other drivers of transportation investment. Table 4.1 summarizes the total federal, state, and local revenues forecasted to be reasonably available to support transportation investments in the SACOG region over the next 20 years. More information about the revenue forecast for the plan is available at the end of this chapter and in Appendix B-1 – Financial Plan.

All of the dollar figures contained in the MTP/SCS are expressed in current dollars as well as year-of-expenditure dollars. The federal Moving Ahead for Progress in the 21st Century Act (MAP-21) 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 20 years.

TABLE 4.1

### Summary of MTP/SCS Revenues

Revenue Source	Current year (2015) Dollars	Year of Expenditure Dollars
<b>Federal</b>	<b>\$3.6 Billion</b>	<b>\$4.8 Billion</b>
State	\$9.7 Billion	\$12.7 Billion
<b>Local</b>	<b>\$21.7 Billion</b>	<b>\$29.1 Billion</b>
Total	\$35.0 Billion	\$46.6 Billion

TABLE 4.2

**Summary of MTP/SCS Investments**

TOTAL BUDGET- 2015 THROUGH 2036 (IN BILLIONS)			
Program Category	2016 MTP/SCS	2012 MTP/SCS	Total Change
<b>1 Maintenance &amp; Rehabilitation (Current Year \$*)</b>	<b>\$12.6</b>	<b>\$10.5</b>	<b>+20%</b>
Year of Expenditure \$	\$16.3		
Maintain Caltrans highways & freeways, maintain local streets& roads, safety investments as part of rehabilitation projects			
<b>2 Road Capital &amp; Operations Projects (Current Year \$*)</b>	<b>\$5.8</b>	<b>\$6.4</b>	<b>-9%</b>
Year of Expenditure \$	\$7.7		
New & widened roads, river crossings, interchanges, etc.			
<b>3 System Management and Operations</b>	<b>\$1.5</b>	<b>\$0.8</b>	<b>+87%</b>
Year of Expenditure \$	\$2.1		
Safety projects, Technology and operational improvements			
<b>4 Transit Operations (Current Year \$*)</b>	<b>\$7.1</b>	<b>\$7.1</b>	<b>No change</b>
Year of Expenditure \$	\$9.1		
Bus and rail operations and maintenance, Paratransit services			
<b>5 Transit Capital (Current Year \$*)</b>	<b>\$3.5</b>	<b>\$3.3</b>	<b>+6%</b>
Year of Expenditure \$	\$4.7		
Strategic Bus & Rail Infrastructure Expansion, Vehicle purchases			
<b>6 Bike/Pedestrian (Current Year \$*)</b>	<b>\$2.8</b>	<b>\$2.5</b>	<b>+12%</b>
Year of Expenditure \$	\$3.6		
Bicycle Facilities, Pedestrian Improvements, ADA retrofits			
<b>7 Programs, Planning, Enhancements (Current Year \$*)</b>	<b>\$1.7</b>	<b>\$1.8</b>	<b>-6%</b>
Year of Expenditure \$	\$2.3		
Project Analysis and Development, Community Design Program, Air Quality Programs, TDM & Traveler Information, Landscaping & Transportation Enhancements			
<b>Grand Totals (Current Year \$*)</b>	<b>\$35.2</b>	<b>\$32.4</b>	<b>+8%</b>
<b>Year of Expenditure \$</b>	<b>\$45.8</b>	<b>\$67.7</b>	

\* 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.

## 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.

- \$12.6 billion (\$16.3 billion YOE) goes to road and highway maintenance and rehabilitation, including routine maintenance, major reconstructions, and various safety improvements.
- \$10.6 (\$13.8 billion YOE) billion goes to transit investments, including a 122 percent increase in bus service hours. An estimated \$3.5 billion (\$4.7 billion YOE) in capital investments support the \$7.1 billion (\$9.1 billion YOE) needed to operate these transit services.
- \$5.8 billion (\$7.7 billion YOE) goes to road and highway capital improvements, including road widening in growth areas, carpool and auxiliary lanes on highways, and new connections for local access.
- \$1.5 billion (\$2.1 billion YOE) goes to system management and operations, including intersection improvements, safety projects, signal timing.
- \$2.8 billion (\$3.6 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.
- \$1.7 billion (\$2.3 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 4.3

**Table of Illustrative Projects**

Table 4.3 provides a set of key projects from the MTP/SCS. Appendix A-1 – Project List includes the full listing of projects.

New Rail	Draft Preferred Scenario
<b>Rail</b>	Capitol Corridor connecting Placer County, Sacramento, and Yolo Counties to the Bay Area by 2036
	Green Line Light Rail to the Sacramento International Airport by 2036
	Downtown Sacramento to West Sacramento streetcar by 2020
	High Speed Rail - Altamont connection from points south, terminating at Sacramento Valley station by 2036
New Bus	Draft Preferred Scenario
<b>Local &amp; Express Buses, Neighborhood Shuttles</b>	Increase bus service with 15 minute or better service from roughly one quarter of all services in 2012 to about half of all services by 2036
<b>Bus Rapid Transit (BRT)</b>	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
<b>Bike Lanes, Complete Streets &amp; Recreational Trails</b>	Emphasis on complete street connections within and between cities, areas of high pedestrian-scale development, and to transit and school facilities (phased completion)
New Roads	Draft Preferred Scenario
<b>US 50 El Dorado</b>	New Silva Valley Parkway Interchange by 2020
	4-lane Green Valley Road, Folsom to El Dorado Hills by 2036
<b>US 50 Sacramento</b>	New carpool lanes, Watt Ave to downtown Sacramento by 2036
	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
<b>I-80 &amp; I-5 Yolo/North Sacramento</b>	<p>New auxiliary lanes from Del Paso Rd. to Hwy. 99 by 2036</p> <hr/> <p>I-5/State Route 99 interchange improvements by 2020</p> <hr/> <p>New carpool lanes on I-80 and U.S. 50 connecting Davis to Downtown Sacramento, with new bike bridge across the Yolo Causeway by 2036</p> <hr/> <p>New carpool lanes on I-5 and I-80 to downtown Sacramento by 2036</p>
<b>I-80 Sacramento</b>	<p>Carpool lane extension, Watt/Longview west to I-5 by 2020</p> <hr/> <p>Business 80/Capital City freeway capacity and operational improvements by 2036</p> <hr/> <p>Roseville Road widened to 4 lanes, from Watt Ave to Walerga Road by 2036</p>
<b>I-80 Placer</b>	<p>I-80/SR 65 interchange improvements by 2036</p> <hr/> <p>Truck climbing lane from Colfax to Magra Road by 2020</p>
<b>SR 65</b>	<p>Operational improvements in Marysville through area where SR 20, 65 and 70 come together by 2020</p> <hr/> <p>Capacity and operational improvements from Galleria Blvd. to Lincoln Blvd.</p>
<b>Placer Parkway</b>	<p>New 4-lane divided facility from SR 65 to Watt Ave; Interchange at SR 65 Whitney Ranch; at-grade crossings at Fiddymont, Foothills, and Watt by 2036</p>
<b>SR 99/70, Sacramento, Sutter &amp; Yuba</b>	<p>Operational improvements between I-5 and Placer Parkway (phased completion)</p>
<b>I-5 South, Sacramento</b>	<p>New carpool lanes, downtown Sacramento to Morrison Creek by 2036</p>
<b>SR 99, Sacramento</b>	<p>New southbound auxiliary lane, Elk Grove Blvd. to Laguna Blvd by 2036</p>
<b>Capital Southeast Connector</b>	<p>New four lane connector along White Rock and Grant Line Road from US 50 in El Dorado County to Douglas Road in Sacramento County, continuing with four lanes on Grant line from Bradshaw Road to Kammerer Road. (phased completion)</p> <hr/> <p>Future work will include four lanes on Grant Line between Bradshaw Road and Douglas Road</p>
<b>New River Crossings</b>	<p>5th St. Feather River bridge rebuilt/widened to 4 lanes by 2020</p> <hr/> <p>I Street Bridge Replacement between Sacramento and West Sacramento by 2020</p> <hr/> <p>10th St. Feather River bridge widened to 6 lanes by 2036</p> <hr/> <p>New Broadway Bridge connecting Sacramento and West Sacramento by 2036</p> <hr/> <p>New all-modal river crossing between Downtown and Natomas by 2036</p>

## Road & Highway Maintenance, Rehabilitation, and Complete Streets

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

The plan area covers approximately 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 \$12.6 billion (\$16.3 billion YOE) to preserve, maintain, and rehabilitate the region's roads, highways, bridges, trails, sidewalks and other bicycle and pedestrian facilities. For the 2016 MTP/SCS, SACOG took a renewed focus on preserving existing assets and reducing maintenance backlogs before adding new infrastructure that would require even more maintenance spending in the future.

Compared to the 2012 MTP/SCS, the 2016 plan increases the budget for maintenance and rehabilitation by more than \$2 billion in current year dollars or 20 percent. This increase comes from a greater focus on system preservation using existing revenues by shifting funding away from expanded roadways and new revenues including sales taxes, state cap and trade funding, and a better accounting of federal funding for bridge preservation. Around two-thirds of the maintenance and rehabilitation budget is related to city and county maintenance of local streets and facilities. The balance is administered by Caltrans for maintenance of the state highway system.

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.

Many road maintenance or rehabilitation projects present opportunities to improve the travel experience of bicyclists and pedestrians. In addition to the direct investments assumed for the bicycle and pedestrian budget, discussed below, SACOG assumes that when appropriate and feasible, maintenance projects will include bicycle and pedestrian components such as striping and signage, sidewalk gap closures, ADA retrofits, and intersection improvements.

SACOG assumes complete streets improvements are considered as part of rehabilitation projects to help improve mobility for all travel modes. In the past, the planning, design, construction and operation of a street improvements, rehabilitation or new construction, 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. SACOG's Complete Streets Toolkit (<http://www.sacog.org/complete-streets/toolkit/START.html>) includes an up to date collection of resources related to planning, building, and maintaining complete streets as part of the transportation system.

SACOG estimates that at least one-third of the roadway projects in the MTP/SCS include complete streets elements. However, due 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. The MTP/SCS makes provisions for the inclusion of complete streets 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.

### Road, Highway, and Bridge Capital Investments

#### Emphasis on strategic investments to improve bottlenecks

The MTP/SCS spends \$5.8 billion (\$7.7 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. Compared to the 2012 MTP/SCS, road capacity investments are reduced by 9 percent. Despite the decline in overall roadway investment level, the MTP/SCS maintains 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 capacity expansion on 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 4.1 depicts the 2036 road and highway network contained in the MTP/SCS.

A continued shift in MTP/SCS roadway investment priorities from prior plans is reflected in an investment package that focuses on more cost-effective 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. The 2016 MTP/SCS includes a reduction in expanded lane miles from the 2012 MTP/SCS of around

Of the \$5.8 billion (\$7.7 billion YOE) total in this category, the MTP/SCS invests nearly two-thirds of the budget in local roads to accommodate projected growth. More than 90 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:

- 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 2036 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.

#### State Highway Investments

The MTP/SCS invests the remaining third of the road capacity budget in projects that will primarily be carried out by Caltrans. The investment focus is on strategic new carpool lanes, auxiliary lanes, and interchanges along 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 for effective movement of goods throughout the region and for traffic management, as each truck represents the traffic-generating equivalent of two to four automobiles in stop-and-go traffic.

Added freeway lane miles account for less than 5 percent of the total in new roadway capacity. Of this

Figure 4.1

## 2036 Local Road and Highway Network

- 2 Lane Surface Street
- 4 Lane Surface Street
- 6 Lane Surface Street
- Connectors
- Freeway/Expressway
- Rural Highway
- Freeway with Carpool Lanes
- Auxiliary Lane
- County Boundaries





increase in freeway lane miles, nearly all of them 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 on the Capital City Freeway (SR 51) from J Street to Arden Way.
- Auxiliary and transition lanes at and between major interchanges to improve traffic flow
- New interchanges with major arterials along freeways in high growth areas including along Highway 50 in Folsom and El Dorado, the junction of Highway 65 and I-80, and the interchange at Highway 99 and Riego Road in Sutter County.

### Bridge and River Crossing Investments

As a subset of the local road and state highway investments, the 2016 MTP/SCS includes over \$600 million (\$800 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 2036.
- Feather River Crossing- Improvements to the 5th Street Bridge, with redesigned approaches and

distribution on both ends, to link Yuba City and Marysville more effectively.

- 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.

### System Management and Operations

The MTP/SCS invests \$1.5 billion (\$2.1 billion YOE) in system management and operational improvements. These investments are intended to improve the efficiency and safety of the transportation system. Oftentimes, operational improvements can offer an effective alternative to adding new capacity to the roadway system by improving the flow of traffic on existing lanes.

Examples of system management and operations investments in the MTP/SCS:

- 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.
- 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.
- 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.
- Safer crossings at major freight and passenger rail lines for automobiles, bicyclists, and pedestrians.
- Operational improvements for congested or unsafe interchanges, including freeway-to-free-



way 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.

## Public Transit Investments

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

The MTP/SCS provides \$10.6 billion (\$13.8 billion YOE) in transit capital and operating investments. Most of this investment, 67 percent 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 (\$1.1 billion YOE) and are covered by state funding outside the control of regional operators. The remaining \$3.5 billion (\$4.7 billion YOE) 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.

Providing high-frequency service of 15 minutes or better in areas with more compact and mixed uses allows the MTP/SCS to provide cost-effective and productive transit service. Because of higher productivity, there is a significantly higher percentage of operating costs covered by fares - rising from around 24 percent of operating costs in 2012 to 38 percent of operating costs, \$2.2 billion (\$3.0 billion YOE), by 2036. 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, by 2036 the MTP/SCS provides roughly double the amount of

transit service provided in 2012 and increases total daily transit trips by more than 200 percent. Chapters 5 and 10 provide additional discussion of transit productivity.

The MTP/SCS provides increased transit coverage across the region, but focuses on corridors with land uses that support productive transit services. 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 2036 transit network is depicted in Figure 4.2.

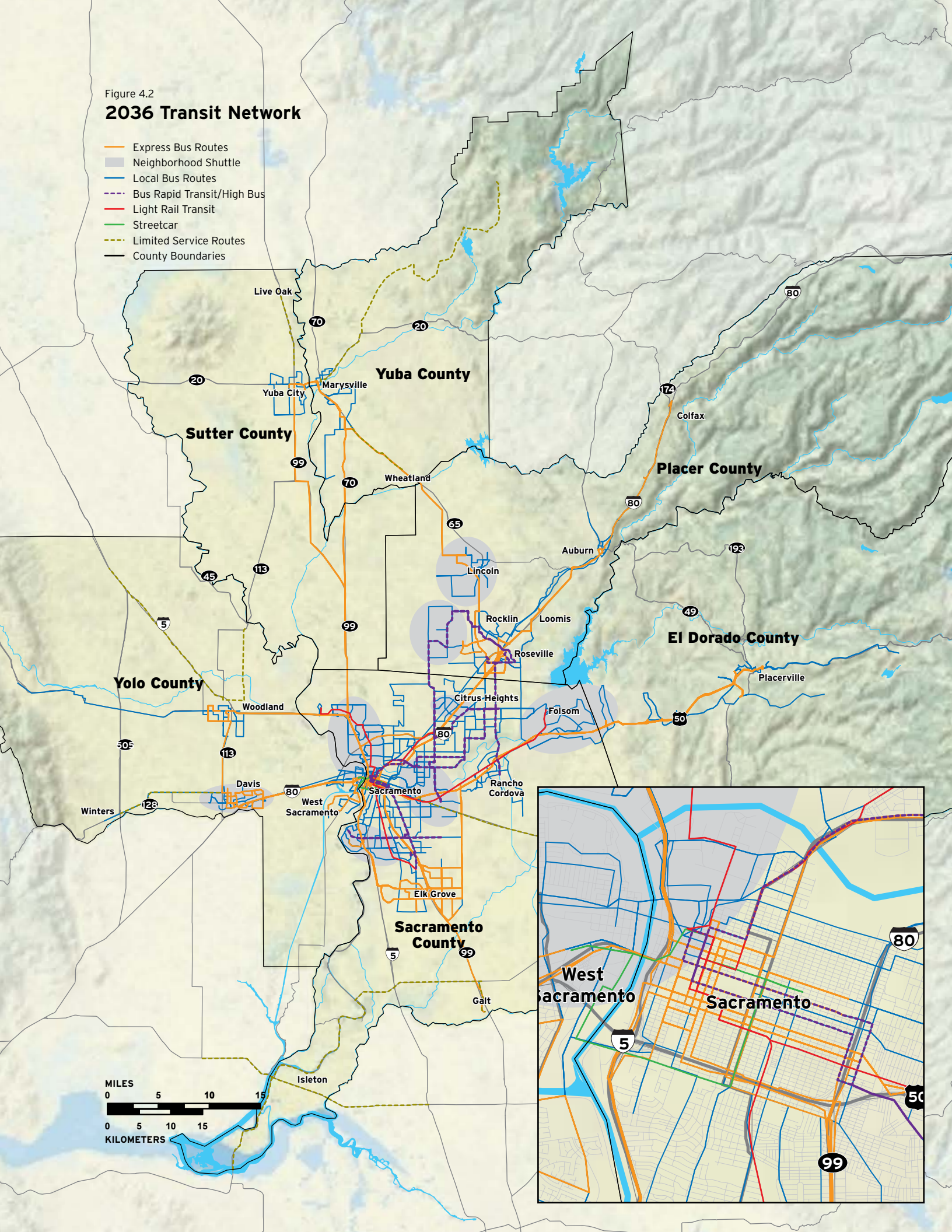
Types of MTP/SCS transit projects include:

- 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 more than half of all transit services (bus and rail) to operate 15-minute or better service by 2036, versus less than a quarter 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 a new streetcar line 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.

Figure 4.2

# 2036 Transit Network

- Express Bus Routes
- Neighborhood Shuttle
- Local Bus Routes
- Bus Rapid Transit/High Bus
- Light Rail Transit
- Streetcar
- Limited Service Routes
- County Boundaries



- 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.

## 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 (\$3.6 billion YOE) in direct investments for bicycle and pedestrian facilities.

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 provides the framework to support 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 Master Plan was adopted by the SACOG Board in 2003 and last amended in early 2015. 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 \$1.7 billion (\$2.3 billion YOE) in funding for supplementary programs and planning efforts.**

Example programs and planning and operations projects include:

- Community Design: Seed funding to encourage smart-growth development projects complementary to the MTP/SCS that may otherwise not happen.
- Air Quality Improvement Programs: Current funding focuses on Transportation Control Measures (TCMs) that sunset in 2018. Existing TCMs include 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. Active efforts are underway to identify air quality improvement programs beyond 2018 that offer strong performance benefits.
- Intelligent Transportation Systems (ITS): With a focus on cost-effective operational improvements, future ITS investments are important strategies



to realize MTP/SCS performance targets. Anticipated investments include additional 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): Current funding through an air quality Transportation Control Measure (TCM) provides support to programs implemented by Transportation Management Associations (TMAs), promotional campaigns including May is Bike Month and rideshare matching services. Strategic planning efforts are underway to identify TDM funding opportunities beyond 2018 that offer strong performance benefits.
- 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, includ-

ing 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 billion (\$45.8 billion YOE) in revenues over the planning period. On average, this comes out to \$1.6 billion (\$2.1 billion YOE) per year over 22 years.

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 two decades. 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 plan also includes assumptions for new revenues coming from eventual sales taxes or equivalent funding mechanisms in Sacramento and Placer counties. The new state of California Cap and Trade Program provides additional funding for certain greenhouse gas reducing transportation projects and transit operations.

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 \$4.1 billion (\$4.8 billion YOE), or 12 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, the Highway Bridge Program, and a few other smaller federal discretionary programs.

### State Revenues

State funds in the MTP/SCS total \$11.4 billion (\$12.8 billion YOE), or 32 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. The new statewide Cap and Trade program also includes some funding for providing ongoing support for transit operations.

### Local Revenues

Local funds in the MTP/SCS total \$19.5 billion (\$29.1 billion YOE), or 56 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 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 MTP/SCS is carried out gradually through shorter-term decisions that assign state and federal funds to specific projects through periodic funding or programming cycles. By adopting the MTP/SCS, the region will achieve consensus on transportation system needs over the next two decades, and it will also set the stage for the short-term strategy to implement the plan.

The plan must spread projects throughout the planning period 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. Therefore, the completion year of a project in the MTP/SCS may reflect either its priority or its realistic schedule (regardless of priority). The MTP/SCS spreads out completion years of projects, with higher priority projects taking place earlier. However, one should not interpret a project's priority solely by its completion year. A project's completion year may simply reflect its schedule constraints. For example, a larger, more complex project may begin early but show a completion year beyond where its relative priority would warrant.

The draft project list meets the following objectives:

- Balance revenues and expenditures over the 22-year planning period – Projects are scheduled to match the pace at which revenues are available proportionally over 22 years, which limits the number of projects that can be planned for any given year and forces decisions about relative priority.
- Support attainment of air quality standards – SACOG analyzes the MTP 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.

It is typical that, as project sponsors implement projects contained in the MTP/SCS, they may need to change their project in the plan. For this reason, SACOG may amend the MTP/SCS from time to time. When it does, it must verify both financial constraint and air quality conformity. SACOG may amend the plan in order to reflect the latest cost, scope, or schedule of projects.

Several sources of "regional" funding are included in the MTP/SCS and are used to implement the MTP/SCS. Federal and state laws designate certain funds as regional, and the regional agency decides how those funds are used. 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, as an MPO, 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. SACOG programs these funds for the four counties. Per memoranda of understanding with El Dorado County Transportation Planning Commission (EDCTC) and Placer County Transportation Planning Agency (PCTPA), these agencies program CMAQ and RSTP separately for El Dorado and Placer Counties.

Under state law, SACOG, as an RTPA, receives a share of funds through the State Transportation Improvement Program (STIP) every two years, currently amounting to about \$20 million per year. STIP funds are comprised of both state and federal fund sources. EDCTC and PCTPA – also RTPAs – receive STIP funds directly.

Under state law, SACOG, as an MPO, receives a share of Regional Active Transportation Program (Regional ATP) funds through the STIP every two years. Regional ATP funds are comprised of both state and federal fund sources. Regional ATP is the one source of funding programmed by SACOG for the entire six-county region.

SACOG indicates in the MTP/SCS the types of projects on which it intends to spend regional funds during the 22 years of the plan. While the plan identifies a long list of specific projects, it does not specify which funds will be used to build which projects. Selection of 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 EDCTC and PCTPA, respectively.

Project sponsors, including cities, counties, transit operators, and Caltrans, carry out the MTP/SCS by using available resources to implement the projects designated in the plan. In programming, SACOG assigns its regional funds in specified amounts to specific projects, shown in a document that SACOG calls the Metropolitan Transportation Improvement Program (MTIP). After being approved by Caltrans, the Federal Highway Administration, and the Federal Transit Administration, the MTIP officially becomes 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 it lays out the commitments of funding that the agencies will need to complete those projects in a manner that is consistent with the MTP/SCS.

Under current law, the MTIP covers four federal fiscal years (FFYs) and has a shelf life of four years. The current MTIP covers the federal fiscal years 2015-2018 and expires in December 2018. Although it expires after four years, SACOG adopts a new one every two years, so the next MTIP is due in mid-2016. SACOG also amends its MTIP periodically, usually to reflect changes in cost, funding, or schedule to projects, but also occasionally to redefine the scope of a project.

The MTP/SCS and MTIP are linked in two ways. First, any project to be programmed in the MTIP must be consistent with the MTP/SCS. Second, although SACOG does not have to program projects exactly according to the timing and cost laid out in the MTP/SCS, once it does program projects from the plan into the MTIP, the MTIP supersedes the MTP/SCS; in essence, the MTIP becomes the first four years of the plan. A new MTIP or a major amendment to the MTIP will often have to be accompanied by an amendment to the MTP/SCS to keep them consistent.

The MTP/SCS 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/SCS 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/SCS, the total cost of projects and activities cannot exceed an estimate of funds reasonably expected to be available going out to 2036, determined according to various assumptions described in the plan about funding in the future. For the MTIP, the test is much tighter: Funds programmed in the four years of the MTIP must be available, identified, or committed, 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/SCS 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 the project sponsor. For some projects, local agencies seek federal or state funds through SACOG, and, if SACOG programs funds to a project, the project must be amended into the MTIP and kept current. The project sponsor sometimes changes aspects of a project during this delivery process. For example, as engineering work progresses, the sponsor may make more precise cost estimates. These may lead to a need to amend the MTIP (and perhaps the MTP/SCS as well) if the sponsor is relying on federal or state funds to finish the project. As each phase of work on a state or federally funded project becomes ready to proceed, the implementing agency may require the cooperation of SACOG, the State, and/or, federal government. If state funds are involved, Caltrans and the California Transportation Commission must 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

# Land Use–Transportation Connection Trends and Performance

## 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 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.

A major part of the performance outcomes of this MTP/SCS relates to a heightened emphasis on maintenance of the transportation system. This emphasis resulted in a critical look at investments which expand the transportation system. To the extent that some system expansion investments can be delayed, greater investment can be made in maintenance of the system. From the perspective of plan performance, the challenge is to make this change in emphasis in investments without sacrificing the high performance achieved in prior plans.

The background for assessing performance of this MTP/SCS is somewhat different and more complicated than the 2012 MTP/SCS, as well, starting with the base year against which the forecast horizon years are evaluated. For this MTP/SCS, the base year is 2012, which is a recession year. For the last MTP/SCS, the base year was 2008, which was the last year before the recession took hold of the economy in this region. Because 2012 was a recession year, overall employment and household incomes were down, relative to 2008, and the amount of travel was also down. The horizon year forecasts prepared for this MTP/SCS assumed the region's economy returned to a more normal level of employment. So, a normal future year forecast is being compared to a recession base year. For all of the metrics used to evaluate this MTP/SCS, this factor is significant. In some cases, in addition to the 2012 base year, comparisons to the 2008 base year are also provided, to allow for a more consistent assessment of change over time.

Highlights of the performance of the MTP/SCS are:

- Decline in VMT per capita—Expected VMT from all sources in the region decline by 3.7 percent from 2012 levels. This sustains an achievement of the 2012 MTP/SCS.
- Decline in congested VMT per capita—The long range MTP/SCS is forecasted to result in a increase in the amount of congested vehicle travel per capita compared to 2012. This result is related to 2012 being a recession year, with unusually low congestion. Compared to 2008, this MTP/SCS delivers a

decline in congested VMT per capita by 3.9 percent, sustaining this achievement of the 2012 MTP/SCS.

- Increase in travel by transit, bicycle and walking—The MTP/SCS is forecasted to increase trips per capita by transit, bicycle or walk by 30.0 percent, also comparable to the increase in the 2012 MTP/SCS.
- 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 57, a 71 percent increase. 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, the major points of reference for each key indicator is:

- What have the historic trends been for each indicator?
- How do the projections for the MTP/SCS affect the historic trends moving forward to the forecast horizon years?

### 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 2036 conditions to the existing conditions for the 2012 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/SCS is adopted, with versions numbered according to the year the version was finalized. SACSIM11 was used for the 2012 MTP/SCS. SACSIM15 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<sup>1</sup> demand micro-simulation, which represents

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

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-practice<sup>2</sup> 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, congested travel on roadways, and travel on the region's transit system.

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 Pop-Gen software, developed by Arizona State University. The 2008-2012, five-year sample American Community Survey (ACS) data were used to establish controls at tract level and for the 2012 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. Because 2012 was a recession year, some of the 2012 tract-level control variables based on the five-year sample data were adjusted to reflect conditions in 2012 based on single-year ACS data at regional level. For 2036 demographics, the 2012 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 (CCSCE), and approved for use in the development of this plan by the SACOG Board in December 2013. Forecasts projected:

- Household population in the SACOG region increasing by 205,000 from 2012 to 2020, and 811,000 to 2036; and
- The percentage of persons 65-year-and-older increasing from 12.5 percent in 2012 to 16.7 percent by 2020, and 20.9 percent by 2036; and
- Total employment, after dropping 9 percent between 2008 and 2012, increasing 16 percent by 2020 and 50 percent by 2036.

<sup>2</sup> Ibid.



## Costs of Travel

Another key factor influencing travel behavior is the relative cost of different forms of travel. The time period from about 2005 to the present has seen unprecedented volatility in fuel prices. Year 2008 (the base year for the 2012 MTP/SCS) was the most volatile year on record, with gasoline price-per-gallon reaching a historic high of \$4.55 in June, then plummeting to a five-year low of \$1.88 by December. Since 2008, price volatility has not been as high, but average prices statewide have in general increased, with 2012 being the highest average fuel price in California (\$3.81 in 2010 dollars).

As part of its work to implement technical aspects of SB 375, SACOG worked with other state MPOs to develop consistent consensus future projections of fuel prices for use in each respective region’s implementation of SB 375 greenhouse gas reduction targets. SACOG used this consensus future projection in the preparation of the MTP/SCS: By 2020, fuel prices were assumed to increase to marginally from an average per-gallon price of \$3.81 in 2012 to \$3.94, and \$4.68 by 2035 (all stated in 2010 dollars).<sup>3</sup>

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 24.9 miles per gallon (mpg), increasing to 28.2 mpg by 2036 (compared to 20.0 mpg in 2012). 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 which remain essentially unchanged from the 2012 average cost of \$0.25: \$0.23 per mile by 2020 (a decrease of almost 8 percent) and \$0.25 by 2036 (no change from 2012).<sup>4</sup>

3 These price forecasts, though higher than 2012, are much smaller increases than those used for the 2012 MTP/SCS. The comparable per-gallon gasoline price forecasts used for the 2012 MTP/SCS were \$4.79 by 2020 (21 percent higher than used for this MTP/SCS) and \$5.30 by 2035 (13 percent higher than used for this MTP/SCS).

4 Comparable 2008, 2020, and 2035 auto operating costs used for

## 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*.<sup>5</sup> 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

the 2012 MTP/SCS area \$0.22, \$0.27, and \$0.29 per mile.

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.

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/Cervero 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 one percent increase in the factor. So, an elasticity of -0.2 means a change of -0.2 percent in the outcome, for a one percent increase in the factor.

Not shown on Table 5A.1, but documented in two of research studies, is an indirect relationship between

commercial vehicle VMT and land use density.<sup>6,7</sup> Both studies showed a significant, but not totally consistent, reduction in commercial vehicle VMT per capita in metropolitan areas with higher land use densities, or with higher percentages of population residing in urbanized areas.

Additionally, at least one research study has identified a significant relationship between commute VMT and access to jobs in metropolitan areas. The research focused on the number of jobs within a 4-mile radius of place of residence, which is technically an accessibility measure. However, in jobs-poor locations (i.e. where jobs/housing balance is poor), access to jobs is very poor, too, so for the purposes of the research, access to jobs was treated as a jobs/housing balance variable. The study found significantly lower commutes where jobs/housing balance was better. This basic research finding is corroborated by ACS data in the Sacramento region, where the longest commutes are made by residents of counties with the poorest jobs/housing balance (see Table 5A-2).

6 Michael Burt and Greg Hoover (2006), *Build It and Will They Drive? Modelling Light-Duty Vehicle Travel Demand*, Conference Board of Canada ([www.conferenceboard.ca](http://www.conferenceboard.ca)); available at <http://sso.conferenceboard.ca/e-Library/LayoutAbstract.asp?DID=1847>.

7 M. S. Bronzini (2008), *Relationships Between Land Use and Freight and Commercial Truck Traffic in Metropolitan Areas*, for the Committee on the Relationships Among Development Patterns, Vehicle Miles Traveled, and Energy Consumption; for Special Report 298, *Driving And The Built Environment: The Effects Of Compact Development On Motorized Travel, Energy Use, And CO2 Emissions*, Transportation Research Board ([www.trb.org](http://www.trb.org)); at <http://onlinepubs.trb.org/Onlinepubs/sr/sr298.pdf>.

TABLE 5A.1

**Land Use/Transportation Factors and Travel Outcomes**

Land Use /Transportation Factor	Travel Outcome		
	VMT	Walk	Transit
<b>Elasticity (Change in Travel, with respect to 1% increase in Factor)<sup>1</sup></b>			
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
<b>Change in Travel Outcome, with 10% Increase in Factor</b>			
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.

TABLE 5A.2

**Workers/Jobs Balance and Commute Time**

Land Use /Transportation Factor	2000	2007	2011	'00 to '07	'07 to '11
<b>Workers per Job</b>					
El Dorado	1.81	1.61	1.67	-10.9%	+3.9%
Placer	1.16	1.18	1.24	+1.3%	+5.4%
Sacramento	1.04	1.03	1.07	-1.1%	+4.1%
Sutter	1.39	1.28	1.30	-7.5%	+1.1%
Yolo	0.89	0.89	0.90	-0.0%	+0.9%
Yuba	1.25	1.40	1.52	+12.0%	+8.0%
Total	1.09	1.08	1.12	-1.1%	+3.9%
<b>Commute Time (in minutes)</b>					
				<b>Rank on W/J</b>	<b>Rank on CT</b>
El Dorado	29.7	29.1	29.0	6	6
Placer	27.0	26.7	27.2	3	4
Sacramento	25.4	25.6	25.6	2	2
Sutter	25.4	26.9	27.8	4	3
Yolo	21.2	21.0	22.2	1	1
Yuba	26.2	28.4	29.9	5	5

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. 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.

### Land Use-Transportation in the MTP/SCS

Table 5A.3 provides a summary of key land use-transportation factors in the region, comparing the 2036 changes from the MTP/SCS to 2012. The factors are tabulated by Community Type (see Chapter 3 for a more detailed description of the Community Types).

- Regional accessibility increases by 37 percent overall, with all Community Types increasing by 29 percent or more, relative to 2012. Center and Corridor Communities have the highest level of regional accessibility in both 2012 and 2036 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 2012 and 2036 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 2012 and 2036 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 2012, 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 . 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 2012 and 2036 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 2012, and declining to about one-eighth mile by 2036 based on the MTP/SCS. Overall proximity to transit also improves, declining from 0.72 miles in 2012 to 0.55 miles by 2036.
- 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 ten percent.
- Jobs/Housing Balance improves in major jobs centers, and areas surrounding those centers. Chapter 9 and Table 9.7 provide more detail on this metric and forecasted changes over time, but overall jobs/housing balance improves by about 4 percent, through a combination of development of housing in-and-around jobs-rich centers, and development of jobs in housing-rich centers.



TABLE 5A.3

**Land Use/Transportation Factors by Community Type**

Land Use /Transportation Factor <sup>1</sup>	Community Type				
	Centers / Corridors	Established	Developing	Rural Residential	Region
<b>2012</b>					
Regional Accessibility <sup>2</sup>	503,022	360,974	231,666	108,181	351,079
Street Pattern/Urban Design <sup>3</sup>	114	88	70	17	85
Mix of Use <sup>4</sup>	37	34	16	10	32
Distance to Transit <sup>5</sup>	0.15	0.41	1.03	2.98	0.61
Residential Density <sup>6</sup>	10.5	4.1	2.0	0.3	1.8
<b>2036</b>					
Regional Accessibility <sup>2</sup>	703,961	496,573	342,029	152,655	482,644
Street Pattern/Urban Design <sup>3</sup>	134	99	67	18	95
Mix of Use <sup>4</sup>	36	34	28	10	32
Distance to Transit <sup>5</sup>	0.12	0.36	0.65	3.03	0.54
Residential Density <sup>6</sup>	14.6	4.4	4.8	0.3	2.3
<b>Change from 2012</b>					
Regional Accessibility <sup>2</sup>	40%	38%	48%	41%	37%
Street Pattern/Urban Design <sup>3</sup>	18%	13%	-4%	6%	12%
Mix of Use <sup>4</sup>	-3%	0%	75%	0%	0%
Distance to Transit <sup>5</sup>	-20%	-12%	-37%	2%	-11%
Residential Density <sup>6</sup>	38%	6%	141%	5%	24%

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 1/2-mile of place of residence.

## CHAPTER 5B

# Vehicle Miles Traveled and Roadway Congestion Trends and Performance

## 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<sup>1</sup> and federal<sup>2</sup> 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 vehicle design and safety features, roadway 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.

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>

### 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 80 percent 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 15 percent of total VMT.
- External VMT includes VMT generated by passenger vehicles traveling through the region. Through-trips by commercial vehicles are tallied with commercial vehicle VMT described above. External VMT usually includes slightly less than 5 percent of total VMT.

### 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 1996 through 2012.

- From 1996 to 2000, VMT growth (2.5 percent per year) outstripped population growth (2.0 percent per year), and VMT per capita increased (0.5 percent per year)
- Since about 2000, population growth, on average, has outstripped VMT growth, and VMT per capita has declined. From 2005 to 2008, total daily VMT actually stayed virtually constant, despite modest population growth (+1.2 percent per year), reflecting the slowing of the region's economy, increasing unemployment, higher fuel prices, and other factors. From 2008 to 2012, total VMT increased slightly (+0.3 percent per year), despite population growth at double that rate (+0.6 percent per year).
- The longer term historic growth rates, counting from 1996 to 2012, is 1.6 percent per year for population in the six-county region, and 1.3 percent per year in total VMT.

TABLE 5B.1

**Vehicle Miles Traveled in the SACOG Region, 1996 to 2012**

County	1996	2000	2005	2008	2012
<b>Average Daily VMT on Roadways (in thousands)<sup>1</sup></b>					
El Dorado <sup>2</sup>	3,515	3,930	4,172	4,025	4,074
Placer <sup>2</sup>	6,144	7,361	8,581	8,502	8,605
Sacramento	26,122	29,244	32,145	32,530	32,937
Sutter	1,919	2,150	2,374	2,444	2,283
Yolo	4,584	5,132	5,683	5,489	5,785
Yuba	1,518	1,745	1,849	1,787	1,786
Region	44,875	49,562	54,804	54,777	55,470
Region Pop. (in thousands) <sup>3</sup>	1,751	1,896	2,140	2,215	2,268
VMT per Capita	25.6	26.1	25.6	24.7	24.5
	<b>'96 to '00</b>	<b>00 to '05</b>	<b>'05 to '08</b>	<b>'08 to '12</b>	<b>'96 to '12</b>
<b>Average Annual Growth Rates</b>					
VMT	+2.5%	+2.0%	-0.0%	+0.3%	+1.3%
Population	+2.0%	+2.5%	+1.2%	+0.6%	+1.6%
VMT per Capita	+0.5%	-0.4%	-1.2%	-0.2%	-0.3%

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

**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 57.0 million in 2012 to about 63.2 million by 2020 (an 11 percent increase) and 74.5 million by 2035 (a 30 percent increase). Population over the same periods increases by 9 percent and 36 percent, respectively.

The VMT growth rate through 2035 is projected to decrease from the historic growth rate of +1.3 percent per year to +0.9 percent per year for the period from

2008 to 2036. Moreover, the VMT growth rate is projected to be lower than the population growth rate of +1.2 percent per year, and total VMT per capita is forecasted to decline at -0.3 percent per year.

Total VMT per capita is forecasted to increase during the period from 2012 to 2020 (+0.2 percent per year—see Figure 5B.2 and Table 5B.2). This outcome is in part the result of unusually low VMT in 2012 due to the recession, and recovery of the economy in forecasted between 2012 and 2020, and a forecasted reduction of 8 percent in auto operating costs between 2012 and 2020. Compared to 2008 total VMT per capita, 2020 declines at 1.1 percent per year (see Table 5B.2)

**TABLE 5B.2  
Total Vehicle Miles Traveled in SACOG Region, 2012 and MTP/SCS**

County	2008	2012	2020	2036
Total Weekday VMT on Roadways <sup>1</sup>				
El Dorado <sup>2</sup>	3,871	3,735	4,121	4,666
Placer <sup>2</sup>	9,790	9,894	11,360	13,762
Sacramento	34,666	33,760	37,092	43,669
Sutter	2,146	2,027	2,254	2,777
Yolo	5,807	5,862	6,442	7,431
Yuba	1,772	1,732	1,907	2,215
SACOG Region	58,051	57,010	63,176	74,520
Total VMT per Capita	26.2	25.1	25.6	24.2
Annual Average Growth Rates	'08 to '20	'12 to '20	'20 to '36	'08 to '36
<b>VMT</b>	-0.5%	+1.3%	+1.0%	+0.9%
Population	+0.6%	+1.1%	+1.4%	+1.2%
VMT Per Capita	-1.1%	+0.2%	-0.4%	-0.3%

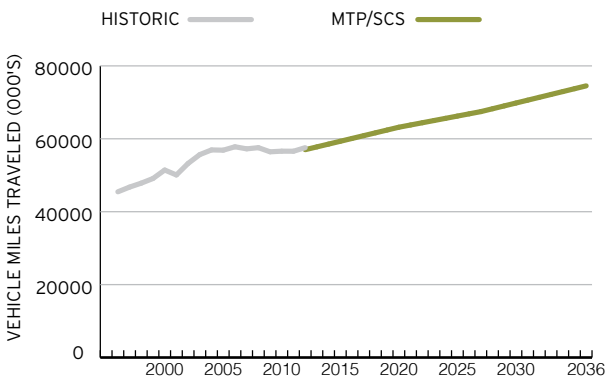
1 Roadway VMT is tallied based on the location of the roadway on which the VMT is forecasted to occur. It is comparable to the VMT reported in “California Public Road Data” reports; however, the CPRD reports average daily VMT, while this table reports typical weekday VMT. Typical weekday traffic is on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

2 Tahoe Basin roadways are excluded from this tabulation

Although VMT increases in total through 2036 for the MTP/SCS, per capita VMT rates decline significantly over the same period. Total VMT per capita declines from 25.1 miles in 2012, to 24.2 by 2036, as shown in Table 5B.2 above and in Figure 5B.2. Although both total and per capita VMT increase from 2012 to 2020, this result is in part related to the relatively low VMT per capita in 2012. Compared to 2008 estimates, 2020 VMT per capita declines -0.2 percent per year.

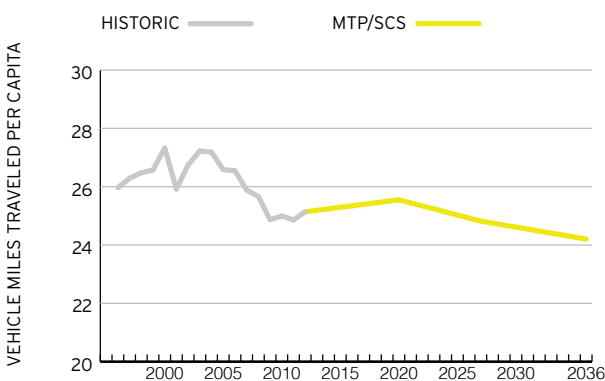


**FIGURE 5B.1**  
**Total Vehicle Miles Traveled in the SACOG Region, Historic Trends and Projected MTP/SCS**



Historic based on CPRD reports. MTP/SCS based on SACOG forecasts.

**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.

**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 2012 and 2036. Household-generated VMT per capita is projected to decrease from 17.9 miles in 2012 to 17.0 miles by 2036, a decrease of 5.4 percent

Commute VMT as a share of total household-generated VMT decreases from 46 percent in 2012 to 45 percent for the MTP/SCS (Table 5B.3), largely due to higher transit, bike and walk mode shares and better jobs/housing balance within the region. 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 travel includes vehicles of all types which are transporting services or goods on roadways within the SACOG region. This source of VMT is not just bigger, multi-axle trucks—it includes transportation of services (e.g. office equipment repair, plumbers, home delivery) which may use smaller vans or even passenger vehicles, as well as small-to-medium sized trucks. Like household-generated VMT, commercial or truck VMT is indirectly related to density—i.e. as density increases, commercial or truck VMT decreases. The MTP/SCS forecasts show a 6.4 percent decline in commercial/truck VMT per job between 2012 and 2036.

Combining all sources of VMT, including external and through travel VMT, forecasted VMT per capita declines from 25.1 miles to 24.2 miles from 2012 to 2036, a 3.7 percent change.

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: 13.1 miles in 2012, decreasing to 11.9 miles by 2036. These rates are 27 to 30 percent lower than regional average. 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: 17.3 miles in 2012, decreasing to 16.3 by 2036. 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: 21.4 miles in 2012, decreasing to 19.8 by 2036. These rates are 17 to 19 percent higher than regional average. Both of these levels are above the regional average (18.8 miles for 2012, and 17.0 for 2036). There are a number of factors related to these VMT rates. First, by 2036 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

**TABLE 5B.3**  
**Vehicle Miles Traveled by Source in SACOG Region, 2012 and 2036**

Variable	2012	2036
<b>Weekday VMT by Source</b>		
Household-Generated Commute VMT <sup>1</sup>	18,599,800	23,363,200
Household-Generated Other VMT <sup>1</sup>	22,109,800	28,895,700
Total Household-Gen. VMT <sup>1</sup>	40,709,600	52,258,900
Commute Share of HH-Gen VMT	46%	45%
External/Through VMT <sup>2</sup>	9,547,400	13,359,700
Through-Travel VMT <sup>3</sup>	6,752,900	8,901,100
<b>Total VMT</b>	<b>57,009,900</b>	<b>74,519,700</b>
<b>Per Capita or Per Job Rates</b>		
Population	2,268,100	3,078,800
Jobs	887,900	1,327,300
Household-Generated VMT per Capita	17.9	17.0
Commercial Vehicle VMT per Job	10.8	10.1
<b>Total VMT per Capita</b>	<b>25.1</b>	<b>24.2</b>
<b>Percent Changes in VMT Per Capita or Per Job, compared to 2012</b>		
HH-Generated VMT per Capita		-5.4%
Commercial Vehicle VMT per Job		-6.4%
<b>Total VMT per Capita</b>		<b>-3.7%</b>

- 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.

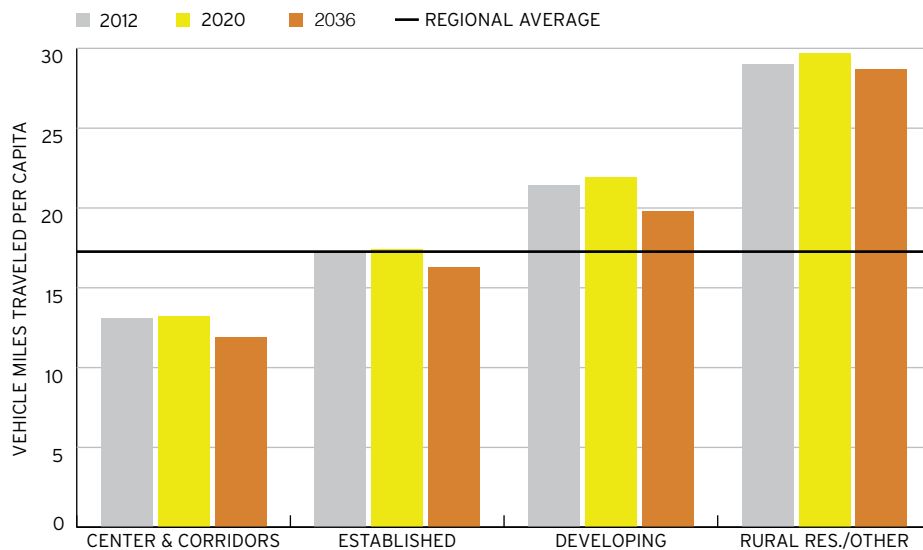
below average (see Table 5A-2), partial build-out limits the potential for land use and transportation factors to reduce VMT. Also, transit service in these areas, while present in the SCS, is limited. As Developing Communities develop more fully, and the full value of planned land uses in these areas 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 29.0 miles in 2012, declining slightly to about 28.7 miles in 2036. These rates are 62 to 69 percent higher than regional average. 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.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.

- For all TPA areas, residents' VMT per capita rates are below the averages for residents of the counties they are in 2036. Residents of TPAs in Placer County are 29 percent below the county average in 2036. Residents of Sacramento and Yolo County TPAs are 23 and 20 percent below the county averages. 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 39,900 people by 2036 (about 11 percent of the county population), while the Sacramento and Yolo County TPAs include 850,000 and 154,000 people, respectively (45 and 56 percent of the county populations, respectively).

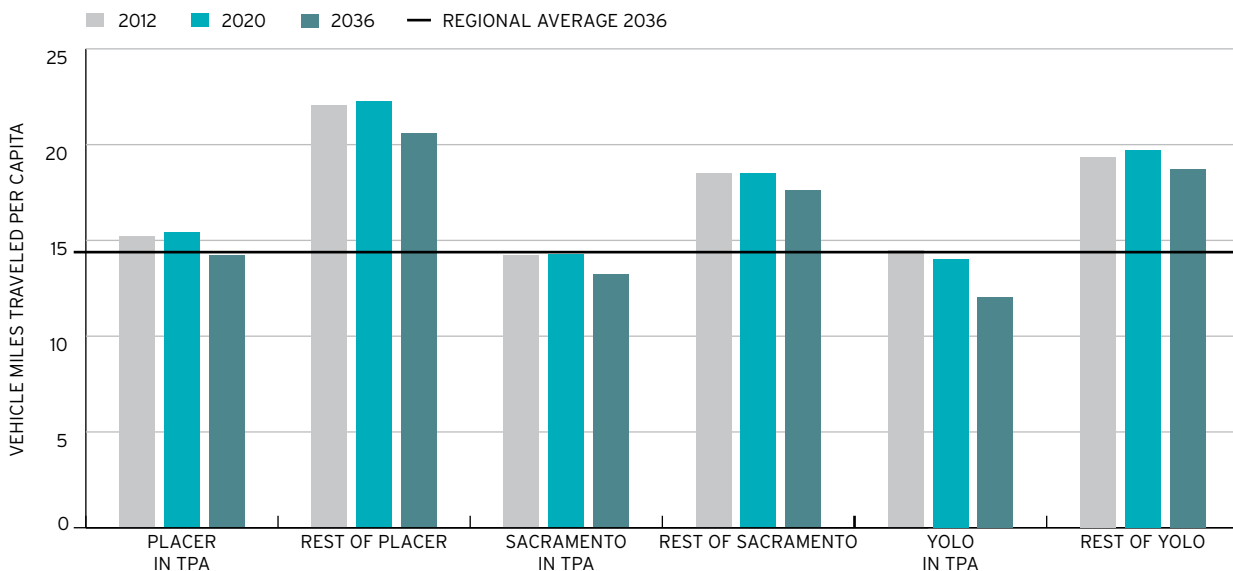
**FIGURE 5B.3**  
**Weekday Household Vehicle Miles Traveled per Capita by Community Type in the SACOG Region<sup>1</sup>**



<sup>1</sup> 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.

FIGURE 5B.4

**Weekday Household Vehicle Miles Traveled per Capita by Transit Priority Area in the SACOG Region<sup>1</sup>**



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.

**VMT and Commute Travel**

Commute travel accounts for 45 percent of all household-generated travel in 2036 (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 11.5 percent, from 20.8 miles per worker in 2012 to 18.4 miles by 2036.
- Workers residing in Center and Corridor Communities have the lowest commute VMT per worker—about 33 percent below the regional average for the 2036 horizon year. Workers residing in Developing Communities have commute VMT per worker 16 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 71 percent above the regional average.
- All Community Types show declines in commute VMT per worker from 2012 to 2036, ranging from 6 to 16 percent compared to 2012 levels.

TABLE 5B.4

**Commute Vehicle Miles Traveled by Community Type in SACOG Region**

Geography	2012	2020	2036
<b>Center/Corridor Communities</b>			
Household-Generated Commute VMT <sup>1</sup>	1,331,100	1,480,300	2,052,200
Resident Workers	90,600	105,900	167,400
Commute VMT per Worker	14.7	14.0	12.3
% Change from 2008 Per Worker Rate	n/a	-4.8%	-16.3%
<b>Established Communities</b>			
Household-Generated Commute VMT <sup>1</sup>	14,026,000	14,961,600	15,105,900
Resident Workers	699,600	778,400	850,500
Commute VMT per Worker	20.0	19.2	17.8
% Change from 2008 Per Worker Rate	n/a	-4.0%	-11.0%
<b>Developing Communities</b>			
Household-Generated Commute VMT <sup>1</sup>	901,800	1,482,600	3,594,200
Resident Workers	36,300	61,200	168,200
Commute VMT per Worker	24.8	24.2	21.4
% Change from 2008 Per Worker Rate	n/a	-2.4%	-13.7%
<b>Rural Residential Communities</b>			
Household-Generated Commute VMT <sup>1</sup>	2,340,900	2,579,400	2,610,900
Resident Workers	69,800	77,900	83,200
Commute VMT per Worker	33.5	33.1	31.4
% Change from 2008 Per Worker Rate	n/a	-1.2%	-6.3%
<b>Region Total</b>			
Household-Generated Commute VMT <sup>1</sup>	18,599,800	20,503,900	23,363,200
Resident Workers	896,300	1,023,400	1,269,300
Commute VMT per Worker	20.8	20.0	18.4
% Change from 2008 Per Worker Rate	n/a	-3.8%	-11.5%

Source: SACOG, July 2015.

<sup>1</sup> Commute tours combine all trips from home to work and back to home into one unit. Tours are roughly equivalent to commute round trips.



### Key Factors Related To Declining VMT per Capita

It is impossible to attribute the full decline in VMT per capita (5.6 percent in household-generated VMT, and 3.7 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.3 illustrates how this factor changes by 2036 for the MTP/SCS. Because the growth that occurs between 2012 and 2036 is more compact, the number of activities within a reasonable travel time increases by 37 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.3 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 Jobs/Housing Balance—Table 9.7 provides tallies of overall improvement in jobs/housing balance for the MTP/SCS. Improving jobs/housing balance facilitates shorter commutes for most workers, and allows for transit, biking and walking to compete with auto modes.
- 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, demographic factors influence the decline in VMT per capita to some degree: for example, 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 one 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 greater than 1.0. 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.

### 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, but has transitioned from one data collection/processing approach (known as HICOMP program) from 1998 to 2009, to the Mobility Performance Reports (MPR) starting in 2009, but with a back-cast to 2005. 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). 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 (+9 percent per year in the TTI data—no data available for 2000 from the MPR reports).
- Significant decreases during the years 2005 to 2008 (-14 percent per year in HICOMP/MPR, -10 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; by the end of 2008, it was nearly 12 percent.
- The MPR and TTI data show differing results for the 2008 to 2011 period: MPR shows -5 percent per year change for delay on the state highway system; TTI shows a modest +2 percent per year change in for all roadways.
- For the entire period between 2005 to 2011, both measures show delay decreasing significantly (MPR shows -9 percent per year change and TTI shows -5 percent per year change).

Chapter 9 – Economic Vitality, discusses the TTI calculation of the total cost of congestion, estimated at \$834 million in the region in 2012.

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 +5 percent per year increases from 2000 and 2005, compared to +9 percent per year from the TTI data. Similarly, the 2005 to 2008 declines in delay were much greater than the estimated decline in congested VMT (-1 percent per year for the congested VMT measure, compared to -10 percent per year for TTI and -14 percent per year for MPR. The comparison flips, though, when looking at the 2008 to 2012 time period: the congested VMT measure shows -12 percent per year change, compared to -5 percent per year for MPR, and +2 percent per year for TTI. For the common period between all three measures, 2005 to 2012, they are fairly consistent: -5 percent per year for the congested VMT measure, compared to -4 percent per year for TTI and -9 percent per year for MPR. The major inconsistency between the measures is the timing of changes in congestion between 2008 and 2012—both TTI and MPR show significant decrease in congestion between 2005 and 2008, and modest change from 2008 to 2012. The congested VMT measure shows modest change between 2005 and 2008, and greater change between 2008 and 2012.

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.

TABLE 5B.5

**Historic Travel Delay in the SACOG Region**

Congestion/Delay Measure	2000	2005	2008	2011/12
Freeway Vehicle Hours of Delay (daily) <sup>1</sup>	n/a	5,399	3,448	2,989
All Road Traveler Hours (yearly, in thousands) <sup>2</sup>	32,076	49,837	36,362	39,138
Congested Vehicle Miles Traveled (weekday, in thousands) <sup>3</sup>	2,541	3,314	3,264	2,250
Annual Average Growth Rates	'00 to '05	'05 to '08	'08 to '12	'05 to '11/12
Freeway Vehicle Hours of Delay <sup>1</sup>	n/a	-14%	-5%	-9%
All Road Traveler Hours of Delay <sup>2</sup>	+9%	-10%	+2%	-4%
Congested Vehicle Miles Traveled <sup>3</sup>	+5%	-1%	-12%	-5%

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.

**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);
- new auxiliary lanes and other capacity improvements on SR-65 in Placer County;
- operational improvements to 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;
  - Capital City Freeway HOV lanes, from “J” Street to Arden Way;
  - 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 to the highest priority segments of the Southeast Capital Connector corridor;
- construction of the initial phases of the Placer Parkway 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 2.3 million daily miles in 2012 to 4.4 million miles in 2036. This is a total increase of 94 percent from 2012, and an average annual increase of 2.8 percent per year over the same time period. Although historically, congestion grew at 5 percent or more per year during the period between 2000 and 2005, this forecasted growth in congestion is significant. However, it should be kept in mind that 2012 was a relatively low year in terms of congestion, due to the effects of the recession on travel in general, and work-related, peak-period travel especially. So, the high growth in congestion from 2012 to 2036 is a result of 2012 being so low, than it is from 2036 being so high.

Another point of reference in looking at changes in congestion is 2008. Compared to 2008, total congested VMT increases by 34 percent, or about one percent per year. On a per capita basis, 2036 congested VMT declines from 2008, from about 1.47 miles to 1.42 mile (-4 percent).

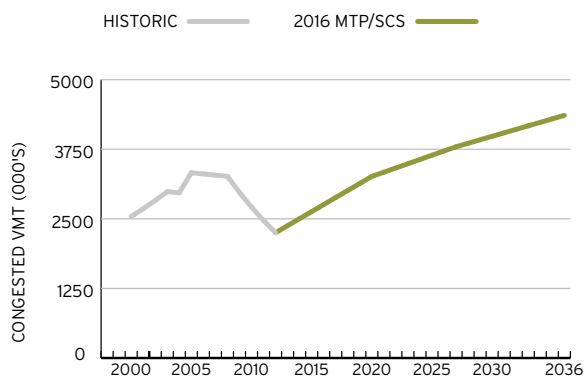
**TABLE 5B.6**  
**Congested Travel in the SACOG Region, 2008, 2012 and 2036**

Variable	2008	2012	2020	2036
Total Congested VMT <sup>1</sup>	3,264,000	2,251,500	3,262,400	4,359,100
Population	2,215,000	2,268,100	2,472,600	3,078,800
Cong. VMT per Capita	1.47	0.99	1.32	1.42
% Change from 2008	n/a	-33%	-10%	-4%
% Change from 2012	n/a	n/a	+33%	+43%

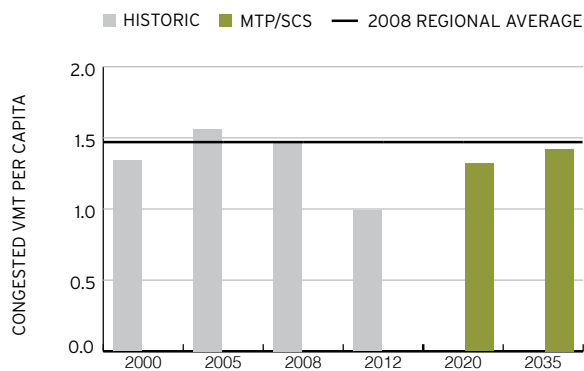
<sup>1</sup> SACOG estimates made using SACSIM regional travel demand model. Congested VMT are VMT occurring on roadways at or near generalized hourly capacity.



**FIGURE 5B.5**  
**Total Congested Travel in the SACOG Region, Historic Trends and Projected MTP/SCS<sup>1</sup>**



**FIGURE 5B.6**  
**Congested Vehicle Miles Traveled per Capita in the SACOG Region, Historic Trends and MTP/SCS**



**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. Compared to 2012, total congested VMT increases to 3.3 million miles (+45 percent) by 2020, and 4.4 million miles (+94 percent) by 2036. Congested VMT generated by households increases the least, from 1.8 million in 2012 to 3.1 million by 2036 for the MTP/SCS, an increase of 72 percent. Commercial vehicle and externally generated congested VMT increases more over the MTP/SCS planning period: commercial vehicle congested VMT increases by 117 percent, and externally generated travel by 313 percent, from 2012. 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 per capita for household-generated travel, and per jobs for commercial vehicle. Household-generated congested VMT per capita declines from 0.78 VMT per person in 2012 to 0.99 by 2036, an increase of 27 percent. Congested VMT experienced by commercial vehicles, normalized by the number of jobs in the region, increases from 0.38 VMT per job in 2012 to 0.55 in 2036, an increase of 45 percent. However, this increase is largely due to the unusually low level of congestion in 2012, during the recession and when unemployment was very high. Compared to 2008, as shown in Figure 5B.6, per capita congested VMT in 2020 and 2036 is significantly lower, preserving the improvement in this metric over time achieved in the 2012 MTP/SCS.

TABLE 5B.7

**Congested Vehicle Miles Traveled by Source in the SACOG Region, 2008, 2012 and 2036**

Travel Source	2008	2012	2020	2036
<b>Region Total</b>				
Household-Generated Commute CVMT <sup>1</sup>	1,640,100	1,071,200	1,580,400	1,773,400
Household-Generated Other CVMT <sup>1</sup>	967,800	704,800	955,100	1,280,800
<b>Household-Generated CVMT<sup>1</sup></b>	<b>2,607,900</b>	<b>1,776,000</b>	<b>2,535,500</b>	<b>3,054,200</b>
<b>Commute Share of Household-Generated CVMT</b>	<b>63%</b>	<b>60%</b>	<b>62%</b>	<b>58%</b>
Commercial Vehicle CVMT <sup>2</sup>	472,900	336,000	496,800	728,900
Externally Generated CVMT <sup>3</sup>	183,200	139,600	230,100	576,100
<b>Total CVMT</b>	<b>3,264,000</b>	<b>2,251,600</b>	<b>3,262,400</b>	<b>4,359,200</b>
<b>Per Capita Rates</b>				
Population	2,215,044	2,268,138	2,472,567	3,078,772
Jobs	969,838	887,920	1,033,250	1,327,278
Household-Generated CVMT per Capita	1.18	0.78	1.03	0.99
Commercial Vehicle CVMT per Job	0.49	0.38	0.48	0.55
<b>Total CVMT per Capita</b>	<b>1.47</b>	<b>0.99</b>	<b>1.32</b>	<b>1.42</b>
<b>Percent Changes in Congested VMT Per Capita or Per Job, compared to 2012</b>				
Household-Generated CVMT per Capita		n/a	+31.0%	+26.7%
Commercial Vehicle CVMT per Job		n/a	+27.1%	+45.1%
<b>Total CVMT per Capita</b>		<b>n/a</b>	<b>+32.9%</b>	<b>+42.6%</b>
<b>Percent Changes in Congested VMT Per Capita or Per Job, compared to 2008</b>				
Household-Generated CVMT per Capita		n/a	-12.9%	-15.7%
Commercial Vehicle CVMT per Job		n/a	-1.4%	+12.6%
<b>Total CVMT per Capita</b>		<b>n/a</b>	<b>-10.5%</b>	<b>-3.9%</b>

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.

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 0.55 miles per capita in 2012 to 0.73 miles in 2036. Although increasing, the 2036 congested VMT per capita for Center and Corridor Community residents is still nearly 30 percent below the 2035 regional average. In part, this is due to much lower commute VMT per capita (see

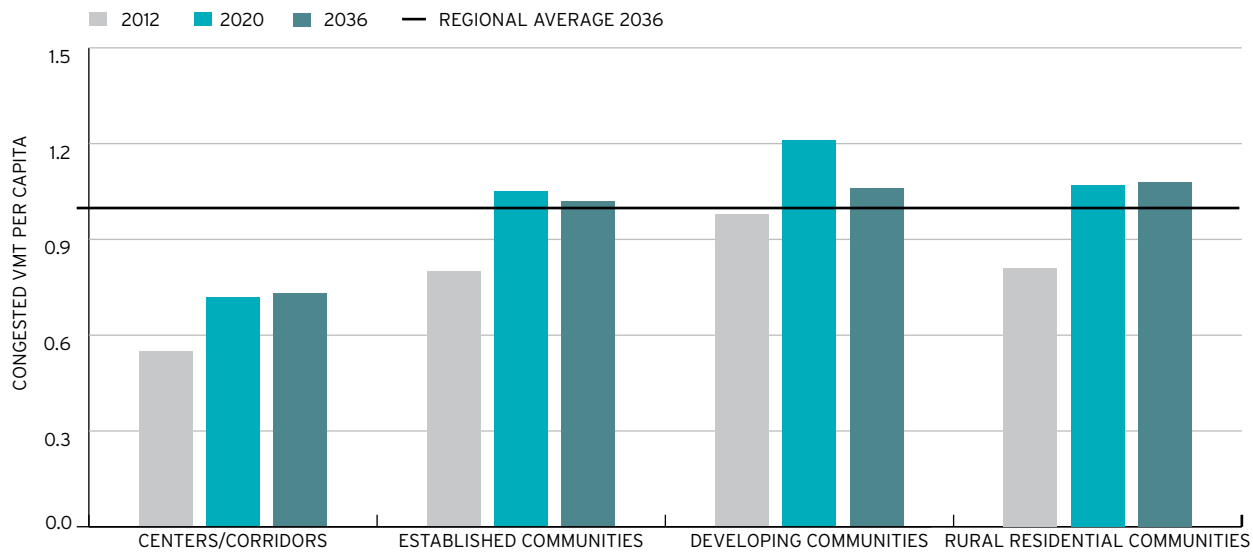
Table 5B.4), and in part due to the availability of transit options during peak periods, when congestion is worst.

- 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. Relative to 2012, per capita congested VMT increases by 28 percent over the MTP/SCS planning period; relative to 2008, it decreases by about 15 percent.
- Residents of Developing Communities would experience congested travel about 7 percent higher than the regional

average of 0.99 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 congested travel at 9 percent higher than regional average.

FIGURE 5B.7  
**Congested Vehicle Miles Traveled by Community Type in SACOG Region<sup>1</sup>**



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.

**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.

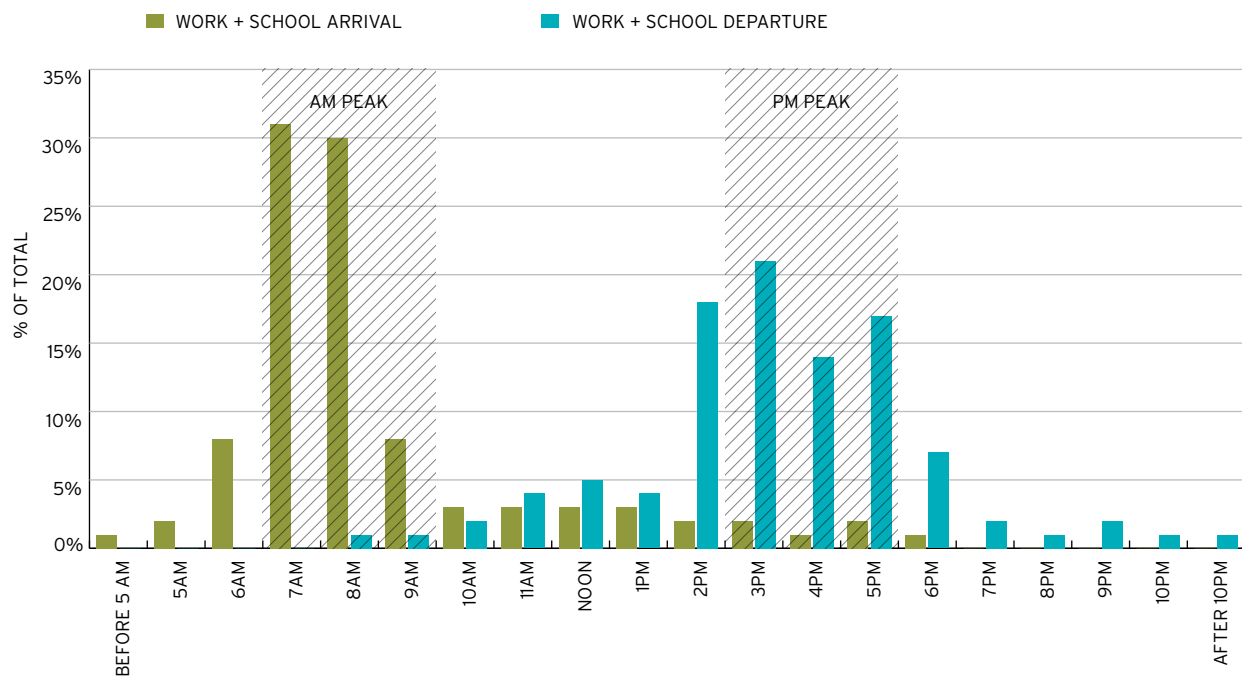
Commuters and students often have very little discretion over when they travel—their times of travel are dictated by their work or school hours. Although the

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 45 percent of household-generated VMT, it accounts for about 60 percent of congested VMT.

FIGURE 5B.8

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



Based on 2000 Household Travel Survey.

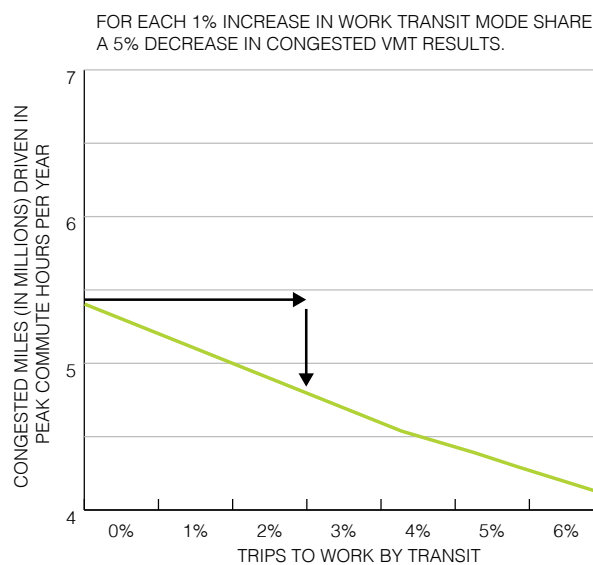
### Key Factors Influencing Reduction in Congested Travel in the MTP/SCS

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 2.5 percent in 2012 to nearly 7 percent in 2036 (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.<sup>3</sup>

FIGURE 5B.9

### Transit Mode Share and Congested Travel in the SACOG Region



### 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.<sup>4</sup>

<sup>3</sup> 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 one percent share increment, represents a 33 percent increase in the number of actual transit trips.

<sup>4</sup> 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](http://opr.ca.gov/sch/pdfs/Ron_Milam_Fehr_and_Peers.pdf)



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.

For the development of this MTP/SCS, the concept of optimal use was implemented through a screening process, which focused on three questions:

1. Is the roadway congested during peak demand periods, either in the base year (2012) or the planning horizon year?
2. Is the increase in capacity on the roadway greater than the projected increase in travel on the roadway?
3. Is the roadway significantly under-utilized during peak periods?

If the answer to any these screening questions was “no”, the project was flagged for potential re-phasing to a later date within the MTP/SCS planning period, including re-phasing to after 2036. This screening process, in combination with an overall policy emphasis on increasing expenditures on maintenance and state-of-good-repair, resulted in 170 lane miles of new or expanded major roadways being removed or delayed until after the planning horizon, compared to the 2012 MTP/SCS.

In order to evaluate the utilization level of roadways for the MTP/SCS 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 0.90 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 1.1.

- 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 0.85, or 85 percent of normal capacity.

For this analysis, only peak period (i.e. the combined AM three-hour and the PM three-hour periods) VMT and utilization levels were included.

Compared to 2012, the MTP/SCS is projected to:

- Increase the percentage of VMT which occurs at optimal utilization level from 28.5 percent to 32.0 percent in 2036 (see Table 5B.8).
- A decrease in the percentage of VMT which occurs at under utilized levels, from 65.8 percent, to 60.3 percent by 2036.
- Increase the percentage of VMT which occurs at over-utilized levels, from 5.7 percent to 7.6 percent. This change is in part due to the lower levels of roadway use and congestion in 2012 overall.

Compared to 2008, the MTP/SCS is projected to modestly improve roadway utilization in all categories:

- Increase optimally-utilized levels from 30.5 percent to 32.0 percent;
- Decrease under-utilized levels from 61.5 percent to 60.3 percent; and
- Decrease in over-utilized levels from 8.0 percent to 7.6 percent.

TABLE 5B.8

**Roadway Utilization in the SACOG Region, 2008, 2012 and 2036**

Roadway Type / Year	Utilization Level <sup>1,2</sup>			Total
	Under-Utilized	Optimally-Utilized	Over-Utilized	
<b>2008 Peak Period VMT by Road Class (in thousands)</b>				
General Purpose Freeways	6,547	2,136	791	9,474
HOV Lanes/Auxiliary Lanes	201	206	86	493
Freeway Ramps	393	48	29	470
Arterials/Expressways	5,641	1,988	531	8,160
Collectors/Local Streets	1,740	2,834	457	5,030
Total	14,522	7,212	1,894	23,627
2008 Share of VMT:	61.5%	30.5%	8.0%	100.0%
<b>2012 Peak Period VMT by Road Class (in thousands)</b>				
General Purpose Freeways	6,923	1,902	552	9,377
HOV Lanes/Auxiliary Lanes	276	265	51	591
Freeway Ramps	384	54	23	461
Arterials/Expressways	5,938	1,636	345	7,919
Collectors/Local Streets	1,713	2,729	351	4,794
Total	15,234	6,586	1,322	23,142
2012 Share of VMT:	65.8%	28.5%	5.7%	100.0%
<b>2036 MTP/SCS Peak Period VMT by Road Class (in thousands)</b>				
General Purpose Freeways	6,821	3,186	885	10,892
HOV Lanes	449	848	179	1,476
Auxiliary Lanes/Ramps	443	63	44	550
Arterials/Expressways	8,028	2,716	797	11,541
Collectors/Local Streets	2,318	2,774	379	5,472
Total	18,059	9,587	2,284	29,931
2036 MTP/SCS Share of VMT :	60.3%	32.0%	7.6%	100.0%

Source: SACOG, July 2015.

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

2 Under-Utilized: &lt;0.95 for GP Freeway; &lt;0.50 for HOV and Aux/Ramp; &lt;0.85 for Arterial/Expressway; no minimum for Collectors/Local Streets.

Over-Utilized: &gt;1.05 for GP Freeway; &gt;0.85 for HOV and Aux/Ramp; &gt;1.15 for Arterial/Expressway; &gt;0.75 for Collectors/Local Streets.

**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

# Transit, Bicycling, and Walking Trends and Performance

## 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 non-profits 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 Murietta, 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 north-

ern California.

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 the 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, environmental clearance, and construction of a third track between Sacramento and Roseville to improve service frequencies to Roseville 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, Yosem-

ite National Park and Las Vegas, Nevada. The Sacramento-to-Bakersfield segment has two daily roundtrips. 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.

FIGURE 5C.1

**Amtrak California Northern California Routes**



Source: Amtrak.com

### **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  
**High-speed rail system proposed route**



Source: California High-Speed Rail Authority, April 2010



## 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 do not meet recommended activity guidelines, and approximately 25 percent report being completely inactive.<sup>1</sup> 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 nearly 2,000 miles of bicycle routes in the region in both urban areas and outside of urbanized boundaries in small urban or rural areas. Bicycle facilities in rural areas allow for both utilitarian and recreational bicycle trips.

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 shortcuts 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.

<sup>1</sup> National Complete Streets Coalition, [http://www.sacog.org/complete-streets/toolkit/files/docs/NCSC\\_CS\\_Promote\\_Good\\_Health.pdf](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-re-

sponsive services) are reported in Table 5C.1. Over the period from 2002 to 2009, total annual passenger boardings increased by 37 percent, compared to 14 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 (13 percent) was slightly lower than population growth over the same period. On a per capita basis, passenger boardings increased by about 20 percent.

Since from 2009 to 2012, these positive trends have reversed. Total annual passenger boardings have declined by 20 percent, and annual boardings per capita by 21 percent. The decline since 2009 is such that for the overall period from 2002 to 2012, per capita boardings have declined by 5 percent. There are two main causes for this precipitous decline: the recession has reduced the amount of travel overall, and that has reduced ridership on transit as well as other modes; and starting in 2009, cuts in service due to declining revenues for operations took a toll on ridership.

TABLE 5C.1

**Transit Passenger Boardings in the SACOG Region, 2002-2012**

Variable	2002	2005	2008	2009	2010	2011	2012
Ann. Pass. Brdgs. (in thousands) <sup>1</sup>	32,208	37,527	40,951	44,057	39,879	34,829	35,426
Weekday Pass. Boardings-Bus <sup>2</sup>	89,300	100,000	96,100	100,800	89,200	87,300	90,100
Weekday Pass. Boardings-LRT <sup>2</sup>	28,500	48,300	51,800	58,000	54,300	43,700	48,200
Weekday Pass. Boardings-Total <sup>2</sup>	117,800	148,300	147,900	158,800	143,500	131,000	138,300
<b>Per Capita Rates</b>							
Population (in thousands) <sup>3</sup>	1,964	2,112	2,215	2,242	2,237	2,249	2,268
Annual Boardings Per Capita	16.4	17.8	18.5	19.7	17.8	15.5	15.6
<b>Changes</b>				<b>'02 to '05</b>	<b>'05 to '09</b>	<b>09 to '12</b>	<b>02 to '12</b>
Annual Pass. Boardings				+17%	+17%	-20%	+10%
Pass. Boardings-Bus				+12%	+1%	-11%	+1%
Pass. Boardings-LRT				+69%	+20%	-17%	+69%
Pass. Boardings-Total				+26%	+7%	-13%	+17%
Population				+8%	+6%	+1%	+15%
Annual Boardings Per Capita				+9%	+11%	-21%	-5%

Source: SACOG, June 2015.

1 SACOG, "Regional Transportation Monitoring Report", April 2010.

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.

Although transit person trips are a better indicator of travel demand by transit than passenger boardings, 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:

- The biggest changes in commuter travel were increases to work-at-home (4.0 percent of workers in 2000, and 5.7 percent in 2012), increases to bicycle (1.3 percent in 2000, and 1.8 percent in 2012), and decreases in carpool (13.7 percent in 2000, and 11.4 in 2012).

- From 2000 to 2012, transit commuters increased from about 21,672 to 22,780, a 14 percent increase—but this increase tracked the increase in total workers, so the transit share remained flat over this period.
- Transit trips for all purposes (including commute) over the same period increased from about 87,000 in 2000 to about 101,000 in 2012. This increase is slightly below population growth over that period, and overall transit share changed little.

### 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 37,589 between 2000 and 2012. The share of commuters biking or walking increased from 3.5 to 3.9 percent—although the increase was due to a 0.5 percent share increase in bicycling, and a 0.1 percent decrease in walking.
- 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 3.5 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 7.3 to 9.1 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.

TABLE 5C.2

**Bike, Walk and Transit Travel in the SACOG Region, 2000-2012**

Mode of Travel	2000	2005/2007	2008	2012
<b>Commuter Travel<sup>1</sup></b>				
Total Workers	852,400	1,001,600	1,020,500	968,200
Drive-Alone	642,369	754,530	767,175	729,452
Carpool	116,694	129,219	126,717	110,789
Public Transit	22,077	23,938	26,104	24,780
Bicycle	11,081	12,938	14,932	17,046
Walk	18,412	21,373	21,617	20,543
Comb. Bicycle and Walk	29,493	34,311	36,549	37,589
Worked at Home	34,096	47,874	50,963	55,129
<b>Mode Shares</b>				
Drive-Alone	75.4%	75.3%	75.2%	75.3%
Carpool	13.7%	12.9%	12.4%	11.4%
Public Transit	2.6%	2.4%	2.6%	2.6%
Bicycle	1.3%	1.3%	1.5%	1.8%
Walk	2.2%	2.1%	2.1%	2.1%
Comb. Bicycle and Walk	3.5%	3.4%	3.6%	3.9%
Worked at Home	4.0%	4.8%	5.0%	5.7%
<b>All Travel</b>				
Public Transit Trips <sup>2</sup>	87,200	101,000	106,000	101,000
Bicycle Trips <sup>3</sup>	113,400	137,000	157,000	166,000
Walk Trips <sup>3</sup>	429,300	588,000	629,000	623,000
Total Person Trips (thousands)	7,378	8,500	8,700	8,600
<b>Mode Shares</b>				
Public Transit	1.2%	1.2%	1.2%	1.2%
Bicycle	1.5%	1.6%	1.8%	1.9%
Walk	5.8%	6.9%	7.2%	7.2%
Comb. Bicycle and Walk	7.3%	8.5%	9.0%	9.1%

Source: SACOG, June 2015.

- 1 SACOG, 2013, based on data from the Year 2000 Decennial Census, and the American Community Survey 3-year sample data releases for 2007, 2008 and 2012. Data shown are 6-county totals, including Tahoe Basin.
- 2 SACOG On Board Transit surveys for 1999 and 2005, interpolated to 2008 and 2012 based on passenger boardings data from operators.
- 3 SACOG estimates based on Year 2000 household travel survey, and SACSIM travel demand model for Year 2005, 2008, and 2012.

### MTP/SCS Changes To The Transit System

As described more fully in Chapter 4, the MTP/SCS more-than-doubles total fixed-route transit service compared to 2012. The plan includes a 122 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 2036, up from 24 percent in 2012.

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 2036, over 442,915 homes and over 631,958 employees will be located within TPAs, increasing the potential number and desirability of daily trips made by transit.

The regional scenarios developed by SACOG to inform the update of this plan (and described in more detail in Chapter 2 – The Planning Process) 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. Chapter 8 has a greater discussion of low income and high minority communities.

The MTP/SCS more-than-doubles total general, or non-demand-responsive, transit service (i.e., light rail, streetcar, regional rail, express bus, fixed route bus, bus rapid transit, and community shuttle) compared to the 2012 base year. The MTP/SCS also adds to the region service types which were not present in 2012: streetcar (in downtown Sacramento), 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 sta-



Figure 5C.3

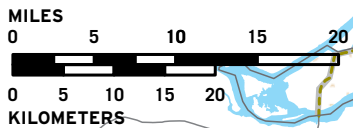
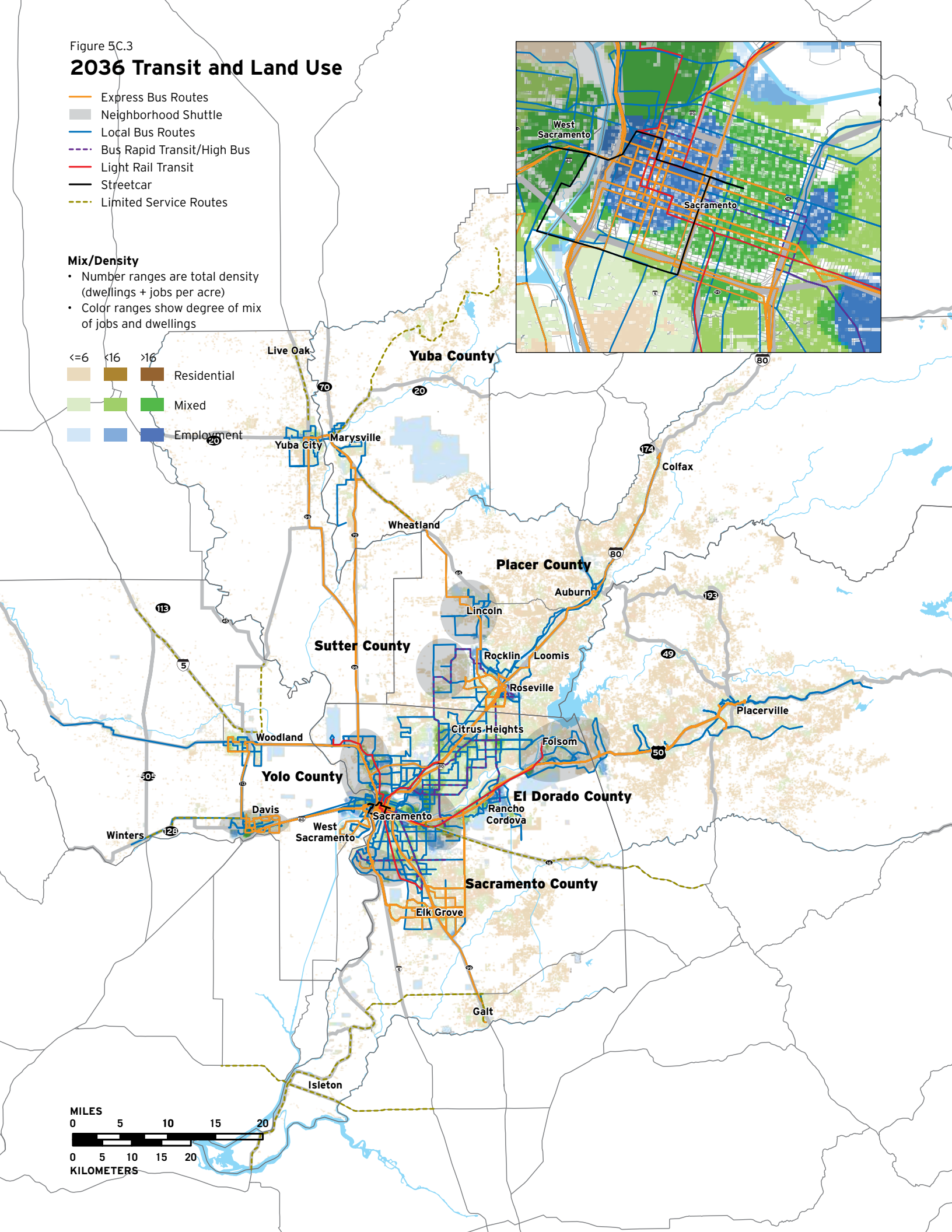
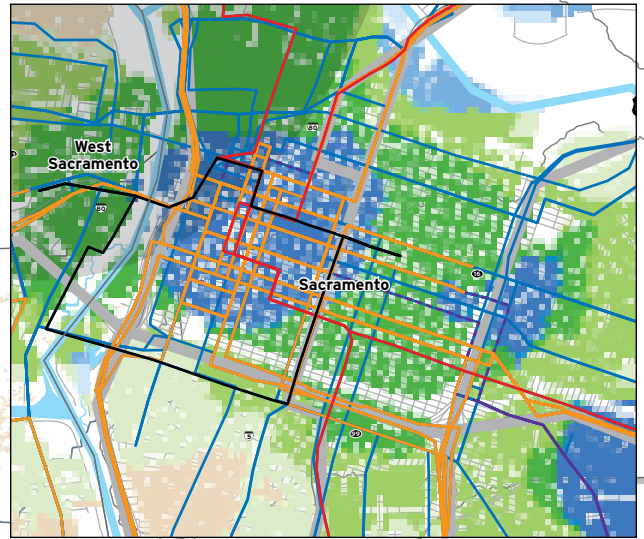
# 2036 Transit and Land Use

-  Express Bus Routes
-  Neighborhood Shuttle
-  Local Bus Routes
-  Bus Rapid Transit/High Bus
-  Light Rail Transit
-  Streetcar
-  Limited Service Routes

## Mix/Density

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

<=6	<16	>16	
			Residential
			Mixed
			Employment



tions spaced one-half mile or more apart, and with maximum running speeds of about 55 miles per hour.

- Streetcar 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 from LRT are that streetcars 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 TransitAction master plan.<sup>2</sup>
- 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.

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

As shown in Table 5C.3, transit service increases significantly in the MTP/SCS. Total service more-than-doubles from 3,782 hours per day to 8,399 hours by 2036. On a per capita basis, service increases by 59 percent by 2036.

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 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 modest increase (6 percent) in transit service hours per capita between 2012 and 2020. This increase would get the region back to the level of transit service provided in 2008, prior to the transit service cuts starting in 2009.

TABLE 5C.3

### MTP/SCS Changes to Transit Service in the SACOG Region

Transit Service Type	2012	2020	2036
<b>Vehicle Service Hours<sup>1</sup></b>			
Light Rail <sup>2</sup>	251	289	386
Streetcar	0	35	95
Express Bus <sup>3</sup>	367	376	626
BRT/Fixed Route Bus	3,154	3,812	6,567
Shuttle	0	27	696
Regional Rail	10	10	29
All Types	3,782	4,549	8,399
Population	2,268.1	2,519.9	3,078.8
Service Hours Per Capita (x 1000)	1.7	1.8	2.7
<b>Changes from 2012</b>			
Light Rail	n/a	+15%	+54%
Streetcar	n/a	n/a	n/a
Express Bus	n/a	+2%	+71%
BRT/Fixed Route Bus	n/a	+21%	+108%
Shuttle	n/a	n/a	n/a
Regional Rail	n/a	--	+190%
All Types	n/a	+20%	+122%
Population	n/a	+11%	+36%
Service Hours Per Capita (x 1000)	n/a	+6%	+59%

### MTP/SCS Changes to the Non-Motorized Transportation System

The MTP/SCS provides \$2.8 billion for bicycle and pedestrian improvements, and assumes that another nearly \$600 million, or about five 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:

- 116 percent more miles of bicycle trails and 126 percent more miles of bicycle lanes than in 2012;
- 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](http://www.sacog.org/complete), to help member agencies and members of the public understand, design, and implement complete streets.

SACOG has recently begun the development of a bike share program. Bike share is a membership program where anyone can pick up a bike from a bike station and return it to another, making trips on bike fast and easy. Bike share provides people with easy access to bikes. Currently, the project proposes to install and operate a pilot system of 88 stations and 616 bikes serving the cities of Sacramento, West Sacramento, and Davis.

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.

As described in Chapter 10 Financial Stewardship, the State's new Affordable Housing & Sustainable Communities grant program presents an opportunity to capture additional funding for complete streets projects along roadways that also have maintenance and rehabilitation needs. Incorporating complete streets elements into road maintenance and rehabilitation projects can greatly increase the coverage and connectivity of facilities for bicyclists and pedestrians.

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; construction of new Class 4 bikeways (also known as "cycletrack"). 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 more-than-double the route mileage of Class 1 and Class 2 facilities. On a per capita basis, Class 1 route mileage, which was about 21.1 miles per

100,000 residents in 2008, would increase by 59 percent to nearly 33.5 miles by 2036. Class 2 miles per capita would increase from 48.3 miles per 100,000 residents to 80.4 the plan period. In total, combined Class 1 and Class 2 route mileage would increase by about 64 percent, from 69.4 to 113.6 miles per 100,000 residents, over the plan period.

A few examples of projects are:

- a new Class 1 route between Missouri Flat and Placerville Drive in El Dorado County;
- a new Class 1 Dry Creek Greenway Trail in Roseville; and
- conversion of abandoned railroad right-of-way in Rancho Cordova, between Folsom and Rockingham Drive.

TABLE 5C.4

**Bike Route Mileage in the MTP/SCS**

County	Class 1	Class 2	Both Classes <sup>4</sup>
<b>Total Miles in 2012<sup>1</sup></b>			
El Dorado <sup>2</sup>	11	20	31
Placer <sup>2</sup>	102	215	317
Sacramento	280	638	918
Sutter	10	40	50
Yolo	65	170	235
Yuba	9	11	20
Region	478	1,095	1,573
Miles Per 100k Population	21.1	48.3	69.4
<b>Total Miles in 2036<sup>3</sup></b>			
El Dorado <sup>2</sup>	70	225	295
Placer <sup>2</sup>	232	308	540
Sacramento	527	1499	2,026
Sutter	28	80	108
Yolo	137	305	442
Yuba	37	58	95
Region	1032	2,476	3,508
Miles Per 100k Population	33.5	80.4	113.9
<b>Change from 2012</b>			
El Dorado <sup>2</sup>	536%	1025%	852%
Placer <sup>2</sup>	127%	43%	70%
Sacramento	88%	135%	121%
Sutter	180%	100%	116%
Yolo	111%	79%	88%
Yuba	311%	427%	375%
Region	116%	126%	123%
Miles Per 100k Population	59%	66%	64%

1 2012 route mileage from SACOG's regional GIS centerline data.

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

3 Estimates of 2036 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.

4 Class IV or "cycletracks" were not present in 2012, and future quantities at region level are uncertain until more bicycle master plans are updated to include them.



### 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 101,400 in 2012 to 338,200 by 2036 for the MTP/SCS, an increase of about 234 percent in total.
- Weekday transit trips per capita for the MTP/SCS increase by 2036 to 0.11 trips/day, compared to 0.04 trips per capita in 2012, and increase of 175 percent in the trip rate.
- Bicycle person trips are projected to increase from 165,500 in 2012 to 250,200 by 2036 for the MTP/SCS, an increase of about 51 percent in total.
- Walk person trips increase from 618,400 to about 974,300, an increase of 58 percent.
- Combined transit, bike and walk trips increase from 885,400 to 1,562,700, a 77 percent increase from 2012 to 2036. On a per capita basis, the combined transit, bike and walk trip rate increases from 0.39 to 0.51, a 31 percent increase.
- Bike and walk trips per capita decline by about one percent from 2012 to 2020. Several factors relate to this decline. First, as mentioned in Chapter 5A and 5B, auto operating costs decline by about 8 percent between 2012 and 2020, which increases the attractiveness of auto travel, and accounts for a part of this decline in bike and walk trip rates. Additionally, the share of growth in Center and Corridor communities, where bike and walk trip rates are the highest, between 2012 and 2020 is relatively low—less than 4 percent of the 2012 to 2036 population growth occurs in Center and Corridor communities by 2020.

TABLE 5C.5

### Transit, Bicycle and Walk Travel in the SACOG Region, 2012 and 2036

Mode of Travel	2012	2036	Change
<b>Weekday Person Trips by Mode<sup>1</sup></b>			
Transit Trips	101,418	338,228	+236,810
Bicycle Trips	165,548	250,218	+84,669
Walk Trips	618,402	974,295	+355,893
Total Trips	885,368	1,562,741	+677,373
<b>Per Capita Rates</b>			
Population	2,268,138	3,078,772	+810,634
Transit Trips	0.04	0.11	+0.07
Bicycle Trips	0.07	0.08	+0.01
Walk Trips	0.27	0.32	+0.05
Total Trips	0.39	0.51	+0.12
<b>Percent Changes in Transit, Bike and Walk Trips Per Capita from 2012</b>			
Transit Trips	n/a	n/a	+175%
Bicycle Trips	n/a	n/a	+14%
Walk Trips	n/a	n/a	+19%
Total T/Bk/Wk Trips			+31%

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.

FIGURE 5C.4

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

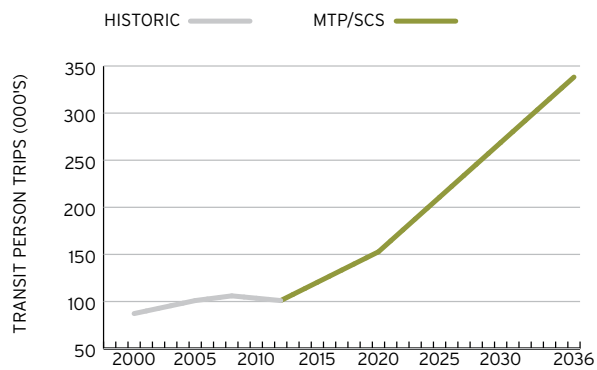


FIGURE 5C.6

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

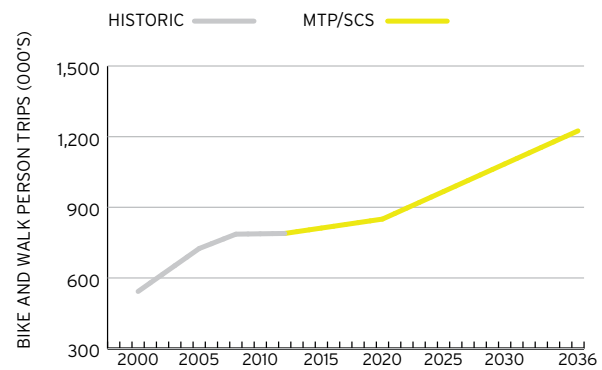


FIGURE 5C.5

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

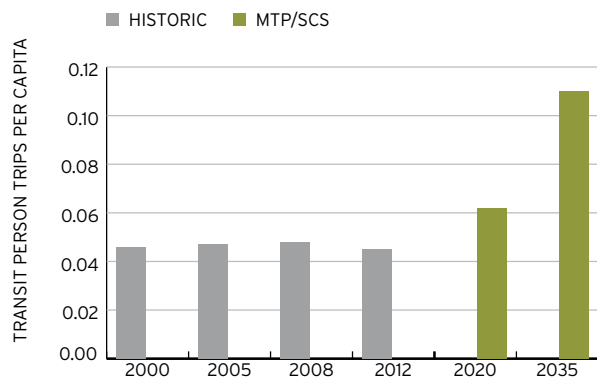
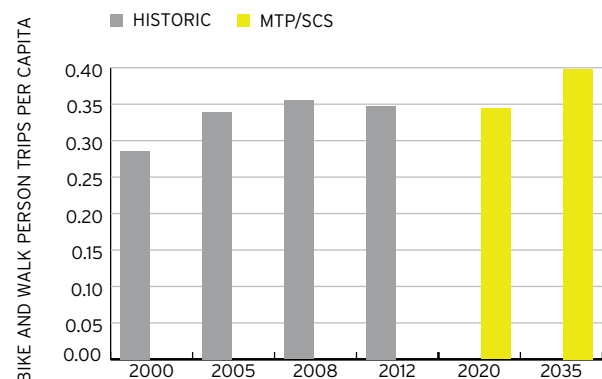


FIGURE 5C.7

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



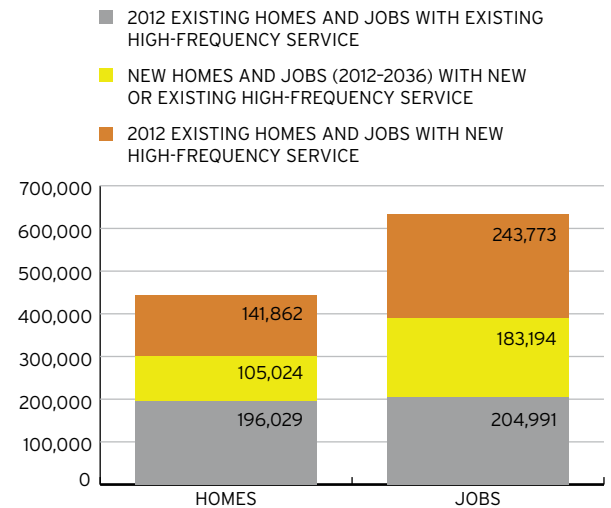
**Transit, Bike and Walk Travel by Community Type**

Figure 5C.8 illustrates differences in combined transit/bike/walk trip-making for residents of different Community Types by 2036.

- For residents of Center and Corridor Communities, combined transit/bike/walk triprate is 1.09 week-day trips per capita, more than twice the regional average of 0.51 trips per capita in 2036.
- For residents of Established Communities, transit/bike/walk trips per capita (0.47) are slightly below the regional average.
- For all other Developing and Rural Residential/Other Community Types, transit/bike/walk trips per capita are 47 percent and 76 percent less than the regional average, respectively.
- For all Community Types, combined transit/bike/walk trip-making increases through the MTP/SCS planning period. As expected, changes from 2012 to 2020 are much smaller than changes to 2036. The transit/bike/walk trip rate increases by about 4 percent between 2012 and 2020, and 30 percent by 2036.

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, 2012-2036**



**FIGURE 5C.8**  
**Transit, Bike and Walk Trips Per Capita by Community Type in the SACOG Region**

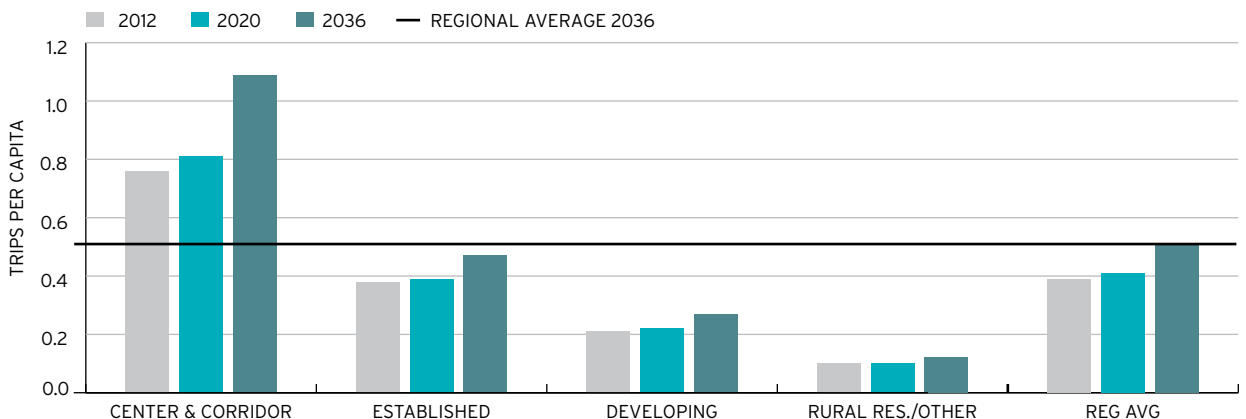


Figure 5C.10 provides a tabulation of transit person trips per capita, split by residents in TPAs and all other non-TPA areas within Placer, Sacramento and Yolo Counties.

- Residents within TPAs make transit trips at about three times the rate of residents in non-TPA areas. For example: In the Sacramento County TPAs, residents are forecasted to make 0.22 person trips per capita by 2036, compared to 0.09 transit trips per capita for residents of non-TPA areas. Transit trip rates are expected to increase in both TPA and non-TPA of the county, increasing by 141 percent in TPA areas, and 148 percent in non-TPA area.
- In Placer County, residents in TPA areas are forecasted to make 0.10 transit trips per capita by 2036, compared to 0.03 for residents of non-TPA areas of the county. Transit trip rates for residents in TPA areas are expected to increase by 197 percent compared to 2012, and by 154 percent for residents in non-TPA areas.
- In Yolo County, residents in TPA areas are forecasted to make 0.24 transit trips per capita by 2036, compared to 0.08 for residents of non-TPA areas of the county. Transit trip rates for residents in TPA areas are expected to increase by 176 percent compared to 2012, and by 184 percent for residents in non-TPA areas.

### 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 2036 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 2012, 76 percent of all commuters drove alone, while only about 36 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 2.5 percent in 2012 to 6.9 percent by 2036.
- Bike and walk share increases from 3.0 percent in 2008 to 3.9 percent by 2036.
- Carpool mode share declines slightly, from about 15.0 to 14.8 percent—however, this represents a change from the historic decline in this mode of commuting.

FIGURE 5C.10

### Transit Priority Areas in the SACOG Region

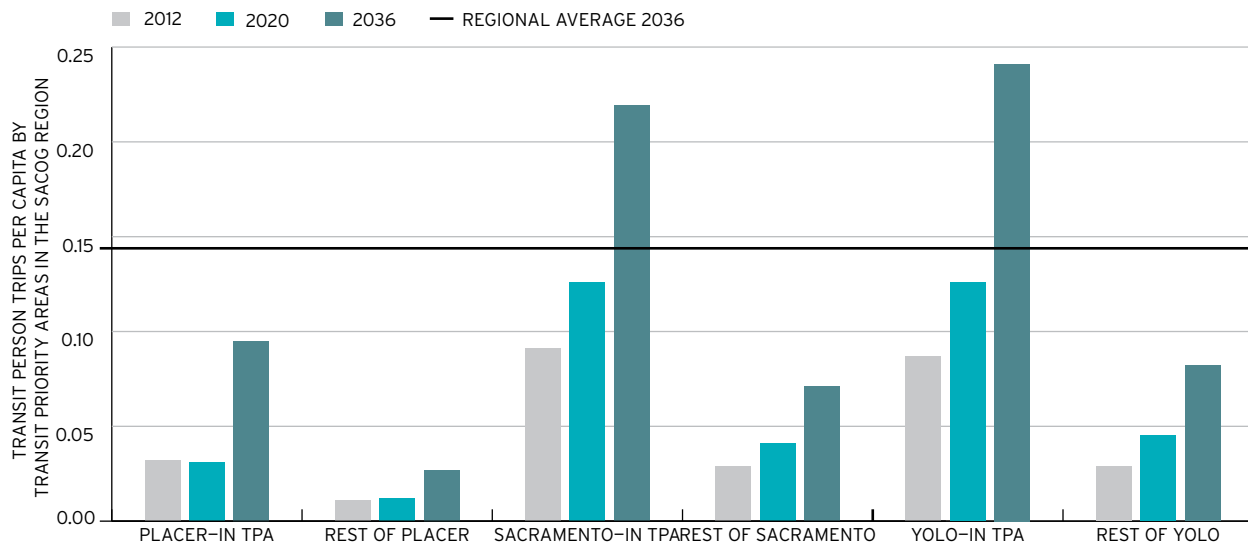


TABLE 5C.6

**Mode of Commute Travel for SACOG Region, 2012 and 2036**

Mode	2012	2036	Change
<b>Weekday Commute Tours<sup>1</sup></b>			
Drive Alone	483,930	638,821	+154,891
Carpool	95,327	132,467	+37,140
Transit	15,720	61,605	+45,885
Bike	8,588	15,646	+7,058
Walk	10,438	19,668	+9,230
Work at Home <sup>2</sup>	20,430	26,792	+6,362
<b>Total</b>	<b>634,432</b>	<b>894,999</b>	<b>+260,567</b>
<b>Commute Mode Share</b>			
Drive Alone	76.3%	71.4%	-4.9%
Carpool	15.0%	14.8%	-0.2%
Transit	2.5%	6.9%	+4.4%
Bike	1.4%	1.7%	+0.3%
Walk	1.6%	2.2%	+0.6%
Work at Home <sup>2</sup>	3.2%	3.0%	-0.2%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	

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 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.

TABLE 5C.7

**Mode of Travel for All Non-Commute Trips for SACOG Region, 2012 and 2036**

Mode	2012	2036	Change
<b>Weekday Non-Commute Person Trips<sup>1</sup></b>			
Drive Alone	2,497,508	3,265,765	+768,257
Carpool	3,515,696	4,735,113	+1,219,417
Transit	57,192	162,914	+105,722
Bike	145,642	213,563	+67,921
Walk	593,874	927,825	+333,951
Other <sup>3</sup>	106,722	121,472	+14,751
<b>Total</b>	<b>6,916,635</b>	<b>9,426,654</b>	<b>+2,510,019</b>
<b>Non-Commute Person Trip Mode Share</b>			
Drive Alone	36.1%	34.6%	-1.5%
Carpool	50.8%	50.2%	-0.6%
Transit	0.8%	1.7%	+0.9%
Bike	2.1%	2.3%	+0.2%
Walk	8.6%	9.8%	+1.2%
Other <sup>2</sup>	1.5%	1.3%	-0.2%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	

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

2 Primarily school bus.



### 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 59 percent on a per capita basis) plus the reduction in distance to the nearest transit station/stop (0.61 miles to 0.54 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 2012. 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: 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 eleven years from 2002 to 2012.

- Total vehicle service hours increased 33 percent from 2002 to 2009, then declined by 14 percent from 2009 to 2012. The net change in total service hours from 2002 to 2012 was a 15 percent increase.
- Light rail transit (LRT) service hours more than doubled from 2002 to 2009, then declined slightly to 2012. Bus service increased 24 percent from 2002 to 2009, then declined by 14 percent to 2012.
- Total passenger boardings increased by 37 percent from 2002 to 2009, slightly outpacing the increase in service hours. Productivity, as measured by boardings per service hour, increased by 3 percent over this period. From 2009 to 2012, both boardings and productivity declined, with boardings dropping by 20 percent, and productivity by 7 percent.

Although there were some positive changes during the course of this period, looked at over the entire eleven-year span, transit productivity declined slightly overall. Ridership increases lagged increases in services slightly.

TABLE 5C.8

**Transit Service and Productivity in SACOG Region, 2002 to 2012**

Variable	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
<b>Vehicle Service Hours (annual, in thousands)</b>											
LRT <sup>1</sup>	103.7	105.8	149.8	197.3	208.9	209.7	215.9	213.1	214.9	195.1	199.7
All Bus	871.4	894.6	997.9	1074.8	1076.5	1104.5	1109.9	1079.5	1042.2	909.6	916.8
Region-wide	975.1	1000.3	1147.6	1272.1	1285.3	1314.2	1325.8	1292.6	1257.1	1104.7	1116.5
<b>Passenger Boardings (annual, in thousands)</b>											
LRT <sup>1</sup>	8,541	8,859	11,022	12,009	14,452	14,490	15,455	17,315	16,198	12,691	13,628
All Bus	23,666	25,787	25,786	25,518	23,889	24,938	25,496	26,742	23,681	22,139	21,798
Region-wide	32,208	34,647	36,808	37,527	38,341	39,428	40,951	44,057	39,879	34,829	35,426
<b>Passenger Boardings Per Service Hour</b>											
LRT <sup>1</sup>	82.4	83.7	73.6*	60.9*	69.2	69.1	71.6	81.3	75.4	65.0	68.2
All Bus	27.2	28.8	25.8	23.7	22.2	22.6	23.0	24.8	22.7	24.3	23.8
Region-wide	33.0	34.6	32.1	29.5	29.8	30.0	30.9**	34.1**	31.7	31.5	31.7

Based on data provided by operators, State Controllers Reports, and the National Transit Database.

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

### 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.

- The MTP/SCS includes a more-than-doubling of the amount of transit service, increasing from 4,159 hours<sup>3</sup> in 2012 to 8,978 by 2036.
- The MTP/SCS includes only a modest increase above 2012 levels by 2020 (4,983 service hours, an increase of 20 percent from 2012). However, service cuts between 2008 and 2012 reduced service by up to 14 percent in the region, so the 2020 MTP/SCS service levels show a rebuilding of those cuts.
- Transit passenger boardings increase sharply for the MTP/SCS. By 2036, total boardings are projected to be 511,200, nearly tripling from 2012.
- Productivity of transit service is projected to increase by 71 percent for the MTP/SCS, increasing from a regional average of 33.3 passenger boardings per service hour in 2012 to over 56.9 by 2036.

<sup>3</sup> 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, 2012, 2020, and 2036

Variable	2008	2012	2020	2036	Changes	
<b>Vehicle Service Hours (weekday)</b>					<b>'12 to '20</b>	<b>'12 to '36</b>
All Rail 1,2	683	638	768	1,089	+20%	+71%
All Bus 3	3,769	3,521	4,215	7,889	+20%	+124%
Region-wide	4,452	4,159	4,983	8,978	+20%	+116%
<b>Passenger Boardings (weekday)</b>						
All Rail 1,2	51,840	48,250	70,664	146,107	+46%	+203%
All Bus 3	96,020	90,090	131,967	365,051	+46%	+305%
Region-wide	147,860	138,340	202,631	511,158	+46%	+269%
<b>Passenger Boardings Per Service Hour</b>						
All Rail 1,2	75.9	75.6	92.0	134.2	+22%	+77%
All Bus 3	25.5	25.6	31.3	46.3	+22%	+81%
Region-wide	33.2	33.3	40.7	56.9	+22%	+71%

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 2012 and 2020, All Rail includes LRT and Capitol Corridor within the SACOG Region. In 2036 MTP/SCS scenario, "All Rail" includes LRT and regional rail, plus streetcar.

3 In 2012 and 2020, All Bus includes express and local fixed route bus service. In 2036, All Bus includes express and local fixed route bus service, plus shuttle and BRT.

### Key Factors in Increasing Transit Productivity

Transit productivity is increased by the MTP/SCS through increasing transit service, and increasing transit boardings even more (nearly tripling). 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 1.36 boardings, indicating that about one-third of all trips include some sort of transfer. This boarding rate is expected to increase to 1.1 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 25 percent of operating costs in 2012 to 38 percent of operating costs (\$2.3 billion) by 2036.



## CHAPTER 6

# Policies and Supportive Strategies

## MTP/SCS Guiding Principles

The MTP/SCS is guided by six principles adopted in 2005 by the SACOG Board of Directors.

### 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 Section 65080(b)). For the 2012 MTP/SCS, the SACOG board adopted 31 policies and many supportive strategies to implement the plan.

Since this MTP/SCS is a refinement of the 2012 plan, 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 to ensure that the plan aligns with the policy themes of the 2016 plan update. Specifically, modifications were made to: emphasize SACOGs' commitment to increasing investment in system maintenance and rehabilitation; commit SACOG to further development of project level decision-support tools; acknowledge and address the unique issues in the range of communities in the SACOG region - suburban, rural, urban and small towns, address climate adaptation; identify strategies for complete streets improvements and road rehabilitation; reflect completed or new research, as appropriate.

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. Successful implementation of the MTP/SCS requires that the policies and strategies also acknowledge and address the unique issues of urban, suburban, rural and small town communities. There is a particular need and interest in addressing the economic challenges particular to “first tier” or “mature,” suburbs - those communities built between 1950 and 1979 and which contain nearly half of the region’s existing households. 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, with particular focus on the regulatory reform needs to support the economic viability of mature suburbs.

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: 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 urban and suburban 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 scoping phase, review transportation projects using appropriate and available project-level analysis tools 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 encourages 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, or walkable communities, 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 transit-oriented development.

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: Use findings from research on parking regulations and pricing to identify opportunities to implement findings, which identify alternatives for local governments to use to modify current parking regulations to create incentives for people to use alternative modes.

3.8 Strategy: Identify best practices for economic revitalization, complete streets, infill, and transit-oriented development in “first tier,” or mature suburbs, which comprise a large amount of Center and Corridor and Established Communities in the region.

**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: Continue to identify appropriate best practices for successful transit-oriented development in different settings through case studies from the 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 economic development initiatives, including the Next Economy - Capital Region Prosperity Plan and the Greater Sacramento Area Economic Council.

**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 devel-

opment 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 agri-tourism-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.

7.8. Strategy: Create a climate action plan focused on agriculture, natural resources, and rural communities that addresses measures from the Scoping Plan Update. Strategies may include the promotion of farming practices that reduce VMT and GHG emissions, the preservation of farmland, and resiliency in rural areas.

7.9 Strategy: Create a regional open space strategy that is informed by RUCS.

**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).

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, expand public access to travel information through 511 program, integrate the Connect Card into other modes of transportation, and support the implementation of a regional bike share and complete streets programs.

9.2. Strategy: Continue to implement MTP/SCS projects that help reduce transportation-related emissions and investigate the creation of a competitive regional funding program to implement air quality improvement and associated greenhouse gas reduction strategies.

9.3 Strategy: Support the SMAQMD's Air Quality and Infill Streamlining (ISP) program.

9.4 Strategy: Implement the regional plug-in electric vehicle infrastructure plan, and create similar plans for other alternative fuels.

9.5 Strategy: Conduct a climate change vulnerability assessment and risk analysis on the region's transportation network, and implement the climate adaptation plan based on assessed vulnerability and risk.

**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 a range of efficient modes to move freight.

10.3. Strategy: Support equipment retrofits under the Carl Moyer program.

10.4. Strategy: Support expanded use of alternative fuel delivery vehicles and handling equipment.

10.5. Strategy: Encourage increased recycling of materials, such as tires and lubricants, and improve handling of waste water and chemical residues.

10.6. Strategy: Explore and publicize energy conservation at freight terminals.

10.7. Strategy: Encourage goods movement driver training programs that encourage fuel conservation, trip reductions and safety.

10.8. Strategy: Keep the transportation system updated to comply with climate adaptation findings in order to reduce costly repairs related to climate impacts.



## Finance Policies and Strategies

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 brought on by a major recent recession. 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 2012, 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. This MTP/SCS assumes two new local funding sources through sales taxes or equivalent means in Sacramento and Placer counties. New funding from the statewide cap and trade program can also help reduce the burden on local resources. However, these sources alone are not enough to fully overcome the shortfall for meeting all of the region's needs. As a result, this plan is forced to face difficult decisions in where funding is prioritized between competing needs such as transit, road maintenance, and roadway expansion.

Federal and state funds that SACOG controls are mainly intended for capital expansion though some can be used to help maintain and operate the system. 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 elsewhere. To better prepare the region to capture funds from competitive programs and to help focus priorities on

the most cost effective solutions, SACOG will continue to improve the region's performance monitoring practices and forecasting of costs and benefits for specific projects. These efforts will help to bolster applications to competitive programs and prioritize local improvements where they can make the biggest difference. 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: 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 for all modes of travel.

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, suburban, small town 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 system maintenance and 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: Look for opportunities to implement findings from the parking pricing study, 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. SACOG is committed to developing project level decision-support tools to support increases in the system maintenance budget for future MTP/SCS updates. These tools include a regional inventory of pavement management systems. Through the RUCS work, SACOG is also 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 concentrates, in large part, on lifeline service to those who are transit dependent and low-income and minority areas. However, much of the potential for more effective transit service comes 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.

17.6. Strategy: Continue research and development of project level decision-support tools to support increases in the system maintenance budget of future MTP/SCS updates.

17.7. Strategy: Pursue opportunities to leverage complete streets and road rehabilitation funding to achieve both objectives.

17.8. Strategy: Support strategies that will make road rehabilitation projects more resilient to climate events that might otherwise shorten the life of a facility.

**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. Emphasize the importance of system maintenance priorities in these plan updates.

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: Support strategies that integrate transit considerations into the implementation of a regional complete streets program that improves 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, integration with future bike share infrastructure, and secure bike storage facilities at 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 juris-

dictions 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 para-transit 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: Seek to facilitate and deploy cost-effective supplemental transportation options, including shared ride arrangements, volunteer drivers, taxi vouchers, vouchers for on-demand rideshare, 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.

24.4. 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.

24.5. 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

The region must plan on strategic expansions 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 inadequate funding 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, which will attract more choice riders and increase fare revenues to support operation of the larger system.

Complete streets, designed for walking, bicycling and transit as well as autos when located in human-scaled, compact, walkable communities, 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 manage congestion. 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. Centers and Corridors and Established Communities with transit-supportive densities of housing, employment and services should be served by more high-frequency transit and bicycle and walking options. The following policies and strategies layout 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.

27.5. Strategy: Provide support for further development of project-level performance assessment methods that can help identify the optimal timing of system expansion projects.

**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 Program, the Regional Active Transportation Program, and the Community Design Grant Program in order to maintain 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, when adequate funding for lifecycle maintenance costs are available.**

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: Determine how climate adaptation findings concerning criticality and vulnerability of the regional transportation system should be addressed in the biennial funding round.

31.3 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

## 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. The environmental sustainability analysis is really shaped by two important factors, SB 375 and SACOG's Rural-Urban Connections Strategy.

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) in 2008 in an effort to provide policy and technical approaches to addressing or avoiding impacts to rural resources in the Sacramento region. 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 75 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

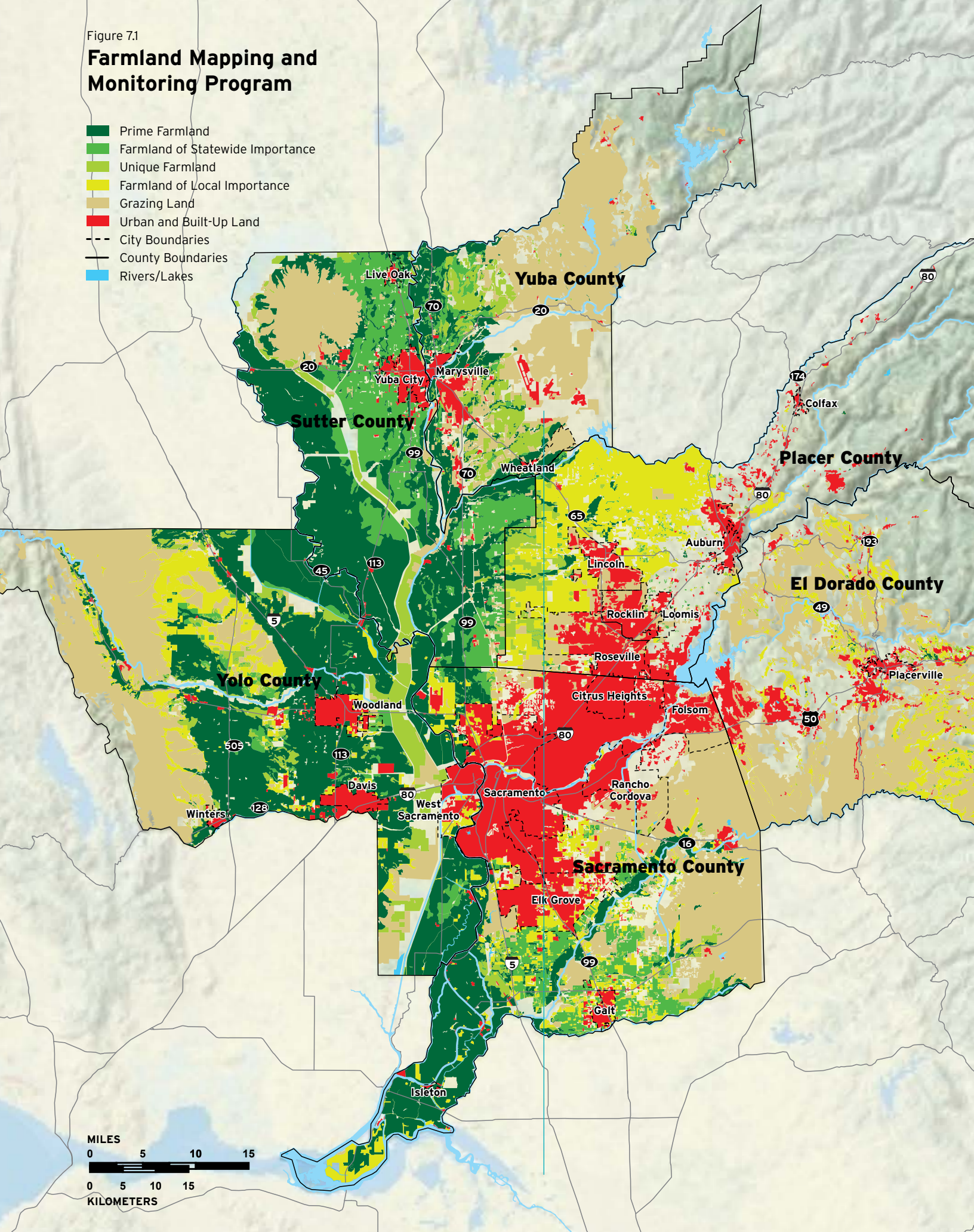
Agriculture has deep roots in our region's history and future. The Sacramento region has some of the most productive farmland in the world. While agriculture is a \$2 billion industry in the Sacramento region, there is more that we get from agriculture than revenue.



Figure 7.1

# Farmland Mapping and Monitoring Program

- Prime Farmland
- Farmland of Statewide Importance
- Unique Farmland
- Farmland of Local Importance
- Grazing Land
- Urban and Built-Up Land
- City Boundaries
- County Boundaries
- Rivers/Lakes



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.

The California Department of Conservation maps farmland throughout California under the Farmland Mapping and Monitoring Program (FMMP). Figure 7.1 shows a 2012 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 by FMMP Mapping Category for Lands in the MTP/SCS Plan Area

Farmland Category	El Dorado	Placer	Sacramento	Sutter	Yolo	Yuba	Region
<b>Prime Farmland</b>	<b>645</b>	<b>7,330</b>	<b>93,918</b>	<b>161,475</b>	<b>250,667</b>	<b>39,942</b>	<b>553,976</b>
Farmland of Statewide Importance	835	4,044	43,579	104,558	17,296	10,852	181,164
Unique Farmland	3,226	17,891	15,063	16,032	42,398	32,390	127,000
Farmland of Local Importance <sup>2</sup>	59,406	99,222	56,980	0	58,129	0	273,737
Grazing Land	193,774	27,879	154,737	53,223	163,619	140,761	733,993
<b>All Farmland</b>	<b>257,887</b>	<b>156,366</b>	<b>364,277</b>	<b>335,288</b>	<b>532,109</b>	<b>223,945</b>	<b>1,869,871</b>
Urban and Built-Up Land	32,316	59,699	180,231	13,608	30,833	14,063	330,750
Other Land	239,169	190,325	73,397	38,468	82,629	167,319	791,307
Water	6,972	5,010	18,149	1,883	7,804	6,628	46,446
<b>Non-Farmland</b>	<b>278,457</b>	<b>255,034</b>	<b>271,777</b>	<b>53,959</b>	<b>121,266</b>	<b>188,010</b>	<b>1,168,503</b>
<b>Total Area Surveyed<sup>1</sup></b>	<b>536,344</b>	<b>411,400</b>	<b>636,054</b>	<b>389,247</b>	<b>653,375</b>	<b>411,955</b>	<b>3,038,374</b>

Source: California Department of Conservation, 2012.

1 Approximately 1,157,000 acres of land within the MTP/SCS plan area in 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).

2 Includes Farmland of Local Potential in Yolo County

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, less than ten 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 2012, a period of 24 years, the region grew by more than 750,000 people. In that same time, according to FMMP summaries from the California Department of Conservation, approximately 214,000 acres of grazing and farmland were converted to urban and rural development. This is the impact the update of the MTP/SCS strives to minimize. For the same planning period of 24 years (2012-2036), and an additional 810,600 people, this MTP/SCS forecasts the conversion of 37,215 acres of grazing and farmland by 2036. And, as Table 7.2 shows, less than half of that impact comes from Protected Farmland (defined as Prime, Unique, and Farmland of Statewide Importance). 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 (FMMP) Protected Farmland**

Farmland Category	Acres of Impact			
	Prime Farmland	Unique Farmland	Farmland of Statewide Importance	Total Protected Farmland
Land Use Growth Footprint	1,722	588	1,905	4,214
Transportation Projects <sup>1</sup>	744	158	338	1,240

Source: California Department of Conservation, 2011; SACOG, 2011

- 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.

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 \$4.5 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 2014**

	Prime	Nonprime	Total	Percent
El Dorado	5,588	26,604	32,192	5%
Placer	12,606	21,695	34,301	5%
Sacramento	92,701	81,256	173,956	25%
Sutter	51,094	13,172	64,266	9%
Yolo	228,388	172,563	400,951	57%
Yuba <sup>1</sup>	0	0	0	0%
SACOG Region	390,376	315,290	705,666	100%

Source: California Department of Conservation, 2014 (Yolo County data is from 2011).

<sup>1</sup> Yuba County does not participate in the Williamson Act program.



As of 2014, the Sacramento region contained a total of 705,666 acres of land contracted under the Williamson Act. Of those acres, about 390,000 acres were prime farmland and about 315,000 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 back-fill 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. Nevertheless, of the 705,666 acres under Williamson Act contract in 2012, only 993 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 following 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 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 64 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. A map of SACOG's 2012 Crop Inventory is shown in Figure 7.2.

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, residents living in the Rural Residential Community Type areas travel an average of 79 miles per household per day, compared to an average of 30 and 47 vehicle miles traveled per household in Center and Corridor and Established Communities respectively. 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.

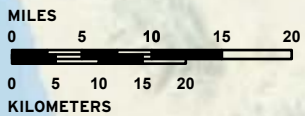
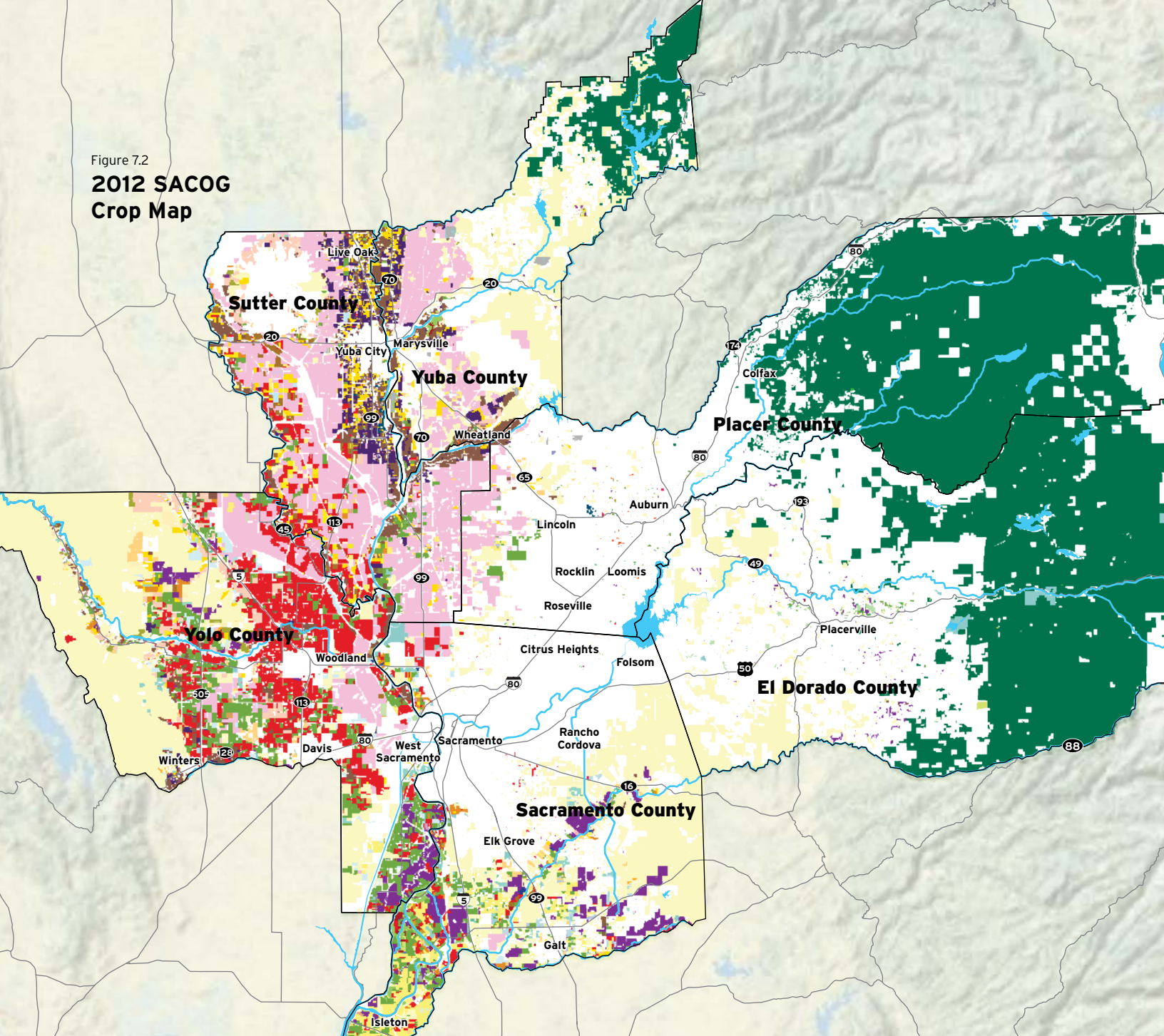
The issues caused by the average daily miles driven in rural areas are compounded by the incoming farmworker traffic to these areas. A lack of farmworker housing not only challenges labor supply, but also may contribute to traffic impacts as workers drive or are transported sometimes long distances. 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 5,100 housing units between 2012 and 2036. 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 \$5.8 billion on regional and 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



Figure 7.2  
**2012 SACOG  
 Crop Map**



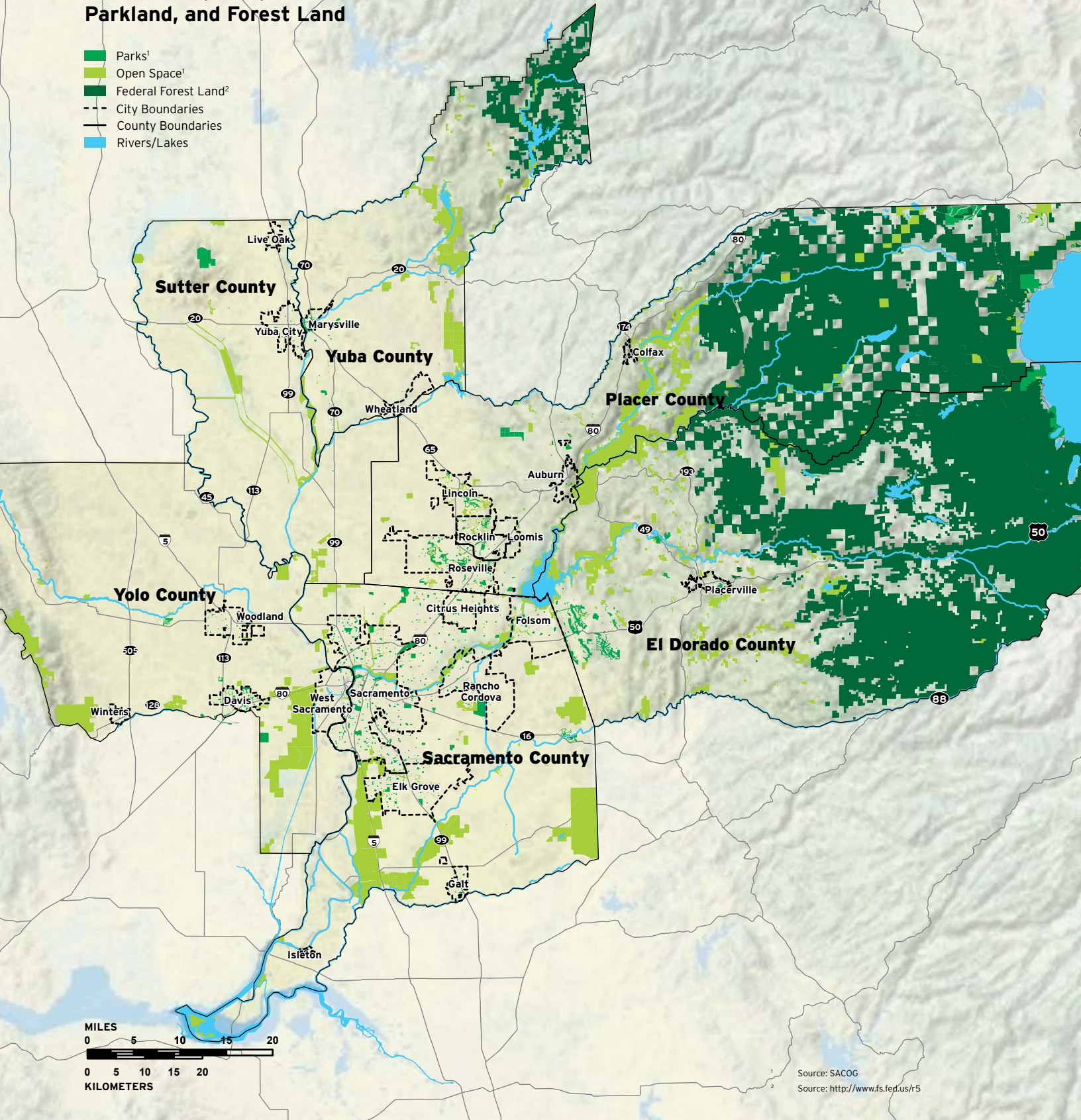
facilities are an important part of the agriculture infrastructure. However, the region has experienced a number of facility closures. Many economic factors—some of them international—contribute to these closures. Trucking products to facilities outside of the region increases vehicle miles of travel, 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.



Figure 7.3

### Plan Area Open Space, Parkland, and Forest Land

- Parks<sup>1</sup>
- Open Space<sup>1</sup>
- Federal Forest Land<sup>2</sup>
- City Boundaries
- County Boundaries
- Rivers/Lakes



1 Source: SACOG  
2 Source: <http://www.fs.fed.us/r5>

### 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. According to the California Protected Areas Database in 2014, roughly 327,500 acres of parks, open space and conservation lands, including 54,600 acres in urban areas (Table 7.4). Figure 7.3 shows a map of open space, parkland, and forest land in the region.

TABLE 7.4

#### Acres In Open Space Land by County, 2012

County	Acres	Urban Open Space <sup>2</sup>
El Dorado <sup>1</sup>	60,825	3,953
Placer <sup>1</sup>	63,677	9,546
Sacramento	90,591	27,489
Sutter	13,949	126
Yolo	64,152	12,319
Yuba	34,329	1,175
<b>Total</b>	<b>327,522</b>	<b>54,609</b>

Source: California Protected Areas Database, 2014. Includes any land that is not forest.

1 Does not include Tahoe Basin.

2 Includes lands designated as city, county, or regional parks or open space and golf courses.

### 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 7.4.

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.

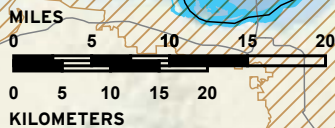
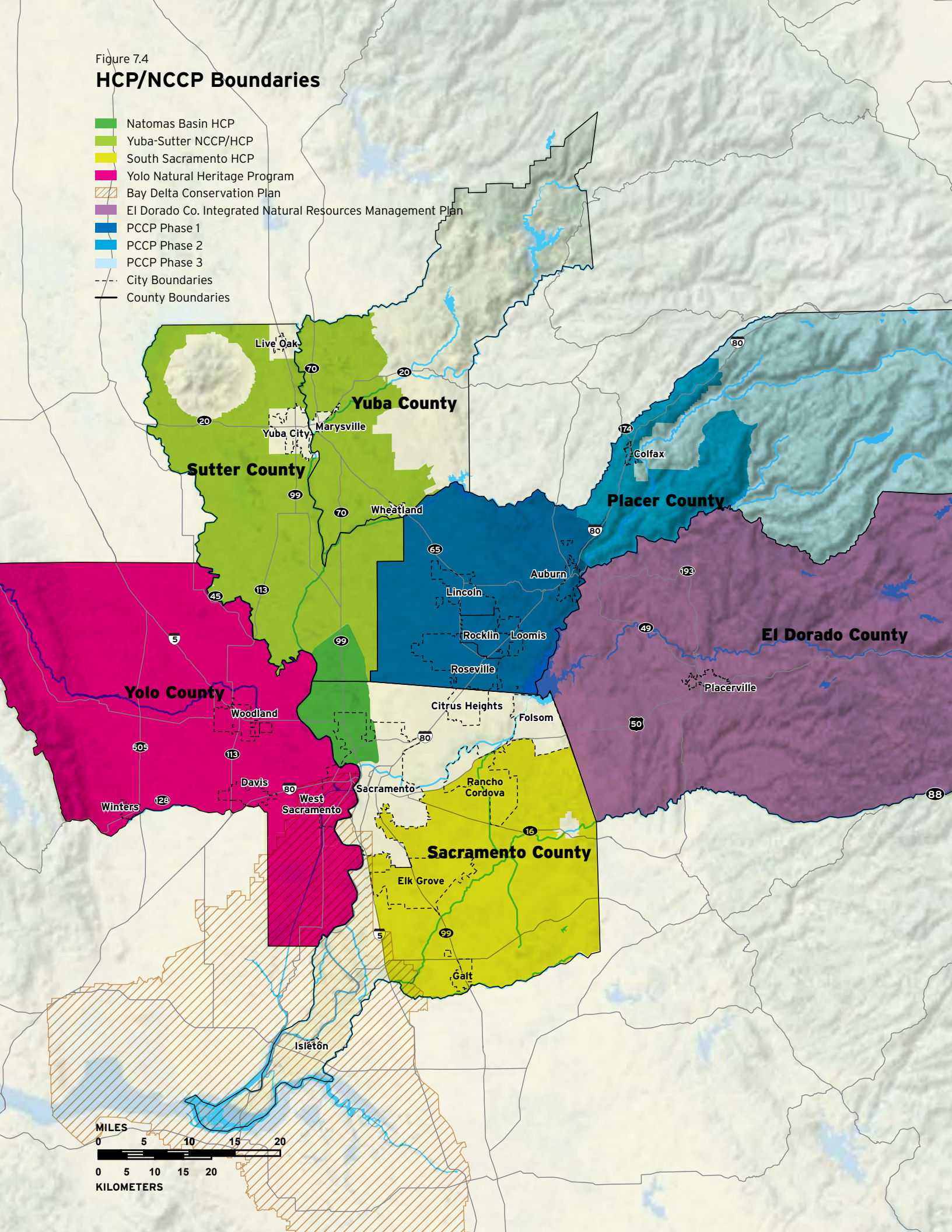
The ultimate resolution of the many on-going natural resources planning efforts will have a major influence on future growth patterns in the region. The land use forecast in this MTP/SCS considered the uncertainties associated with these on-going efforts throughout the region. The progress of these planning 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 7.4

# HCP/NCCP Boundaries

- Natomas Basin HCP
- Yuba-Sutter NCCP/HCP
- South Sacramento HCP
- Yolo Natural Heritage Program
- Bay Delta Conservation Plan
- El Dorado Co. Integrated Natural Resources Management Plan
- PCCP Phase 1
- PCCP Phase 2
- PCCP Phase 3
- City Boundaries
- County Boundaries



### **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 28 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 landowners 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 Elk Grove, 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, as well as the Sacramento Regional County Sanitation District and Sacramento County Water Agency to further advance the regional planning goals of the SSHCP. The Plan is currently under development with a Final EIR/EIS, HCP expected in the fall of 2017. 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.

### **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 wildlife species and plant species. The plan is currently under development with public drafts anticipated in mid-2015/early 2016.

### **Yolo County Natural Heritage/Habitat Conservation Plan/NCCP**

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 more than 650,000 acres and is planned to provide habitat for 12 species. The plan is currently under development with a DEIS/DEIR planned for the summer of 2016 and further expectation of permit issuance in the spring of 2017.

### **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 currently being prepared and is proposed to address 201,000 acres of development and conservation in Western Placer County. In coordination with the federal and state agencies, it is anticipated that a DEIR/DEIS will be released in 2015-2016, with permit issuance expected in 2017. Fourteen 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 will be the development of the plan itself. This includes identification of the mitigation program, development of a funding mechanism, management strategies, and monitoring.

### **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.

### **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 Six-County Aquatic Resources Inventory (SCARI) was completed in 2011 and incorporated into EcoAtlas in 2013. The 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 under review and not yet available publically.

### **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 is 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. The State Water Resources Control Board continues to deliberate on a "flow standard" for rivers that feed the Delta, which could impact how much water needs to remain in the channel and therefore how much can be used for agriculture and urban uses. Numerous other state and federal regulatory authorities have or will made other changes that impact water supply and operations in the region, including operations of Folsom Dam. Groundwater is plentiful in some areas, but challenged in others. Recently enacted state legislation regarding groundwater monitoring and management will certainly impact users, particularly those who are supplied exclusively from aquifers. Local water agencies are also investing in new infrastructure to allow water intraregional water transfers so that water providers can rely on groundwater and surface water as the availability fluctuates. 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. In 2011, the region initiated the North State Water Alliance, which includes membership of water districts, water management organizations,

local jurisdictions, and business groups to identify and advocate on behalf of the region's water resource challenges and opportunities. 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 in California, the Public Policy Institute of California reports that average water use is roughly 50 percent for environmental purposes, 40 percent for agricultural purposes, and 10 percent for urban purposes. 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. As noted in Chapter 3, the MTP/SCS land use forecast includes more compact growth with roughly 70 percent of the new homes being small-lot single-family or attached. 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.

With more demand on water supplies, greater efforts are being made to use water more efficiently. Water supply uncertainty is the byproduct of the ongoing 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 more efficiently. 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 in El Dorado, Sacramento and Placer counties, 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. If the drought persists, the region will likely see more acreage fallowed, a switch to crops that use less water, or investment in high-value crops that can help a farmer cover the rising cost of water.

Water quality regulations 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.

### **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.

Some existing 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 285,000 new housing units forecasted by the MTP/SCS, 76,710 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 eco-

conomic 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/SCS. 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. The levee status report can be found 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.

## 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 about 811,000 people by 2036, 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 elevations anywhere from slightly below sea level near the Sacramento-San Joaquin Delta to over 2,150 feet above sea level at the Sutter Buttes. A portion of the MTP/SCS plan area is located within the Mountain Counties Air Basin (MCAB), which extends from Plumas County down to Mariposa County.

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 (NOX), 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

Federal and state governments — specifically, the Environmental Protection Agency (EPA) and the Air Resources Board (ARB) — each establish ambient air quality standards for several criteria air pollutants. Ambient air quality standards (AAQS) are established to address the impacts of the exposure of people, especially sensitive populations, to hazardous pollutant concentrations, and are periodically updated by assessing newly available scientific information on a given criteria air pollutant. Most of the standards have been set to protect public health, although some are based on other values (e.g., protection of crops, protection of materials, or avoidance of nuisance conditions). For some pollutants, separate standards have been set for different periods of time (averaging times). Measured air pollutant concentrations in the air basins are compared to the AAQS to determine the attainment status of that air basin. Attainment status is a classification of regional air quality that describes whether an air basin is meeting the standards (attainment) or not (nonattainment).

There are five air districts covering the southern portion of the SVAB and the mid-northern portion of the MCAB. Various portions within this area have been classified as either attainment or nonattainment for the established ambient air quality standards at the federal level: ozone is classified as nonattainment, particulate matter with a diameter of less than 10 micrometers (PM10) is designated as attainment, particulate matter

with a diameter of less than 2.5 micrometers (PM2.5) is attainment in the Yuba City/Marysville area and nonattainment in the Sacramento area, and carbon monoxide (CO) is designated as attainment.

### Ozone

The Sacramento Metropolitan Area is designated a severe-15 nonattainment area for the 2008 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 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. A full list of TCMs and the implementation status of these TCMs is available in Appendix F-1 – Conformity Determination.

### Carbon Monoxide

The area monitored for carbon monoxide (CO) levels was redesignated 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 (PM10)**

The United States Environmental Protection Agency (U.S. EPA) designated Sacramento County as a moderate nonattainment area for PM10 in 1994, though Sacramento County was reclassified as a maintenance area for PM10 by U.S. EPA approval through a resignation plan. The area monitored for PM10 consists solely of Sacramento County, though 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 PM10 NAAQS by the attainment deadline of 2000 and has been demonstrating maintenance since then. U.S. EPA approved the PM10 Implementation/Maintenance Plan and Redesignation Request for Sacramento County effective October 28, 2013, showing the 1987 standard for PM10 was attained and establishing the strategy for maintaining the standard through 2022. The area is now designated as attainment.

### **Particulate Matter 2.5 (PM2.5)**

The region as two different attainment geographies for PM2.5 one which is currently classified as attainment and the other which is currently classified as nonattainment. U.S. EPA changed the 24-hour standard for PM2.5 from 65→g/m<sup>3</sup> to 35→g/m<sup>3</sup> in 2006. The two areas failed to meet the new standards and were consequently designated a PM2.5 nonattainment areas in 2009. Sacramento, a portion of Sutter County, the western portions of Placer and El Dorado counties, a portion of Yuba County, the eastern half of Yolo County, and portions of Solano County make up one geography (Sacramento Area). A portion of Sutter and Yuba counties makes up the other geography (Yuba City-Marysville Area). In January 2015, the Yuba City-Marysville Area was reclassified as an attainment area. Work to reclassify the Sacramento Area as attainment will begin in 2015. In the interim, the Sacramento Area remains designated nonattainment.

## **Details of Pollutants in the Region and Their Health Impacts**

### **Ozone (O3)**

Ozone (O<sub>3</sub>) 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 (NO<sub>x</sub>) in the presence of sunlight and heat. Although ozone is the air contaminant for which standards are set, ROG and NO<sub>x</sub> are the pollutants that must be evaluated.

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 (NO2)**

NO<sub>2</sub> 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<sub>2</sub> pollution is most severe close to roadways and in vehicles; consequently, area-wide pollution monitors often show a considerably lower reading of NO<sub>2</sub> pollution than readings collected beside active roadways. NO<sub>2</sub>, when combined with nitric oxide (NO), forms nitrous oxide (NO<sub>x</sub>), a precursor to ozone. There-

fore, reducing the amount of NO<sub>2</sub> created will also decrease the amount of ozone created.

NO<sub>2</sub> 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<sub>2</sub> 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 (PM10)**

Respirable particulate matter (PM10) 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. PM10 pollution can result in damage to vegetation, but the focus is generally placed on the adverse health effects of particulate matter. PM10 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 inhibi-

tion 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 PM10 exposure, as are asthmatic children and the elderly population.

#### **Particulate matter 2.5 (PM2.5)**

Fine particulate matter (PM2.5) consists of small particles, which are less than 2.5 microns in size. Similar to PM10, 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. PM2.5 is also formed through the reaction of other pollutants. As PM2.5 is smaller than PM10, 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 winter time 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 develop-

ment 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 (TAC)**

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 plating 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.

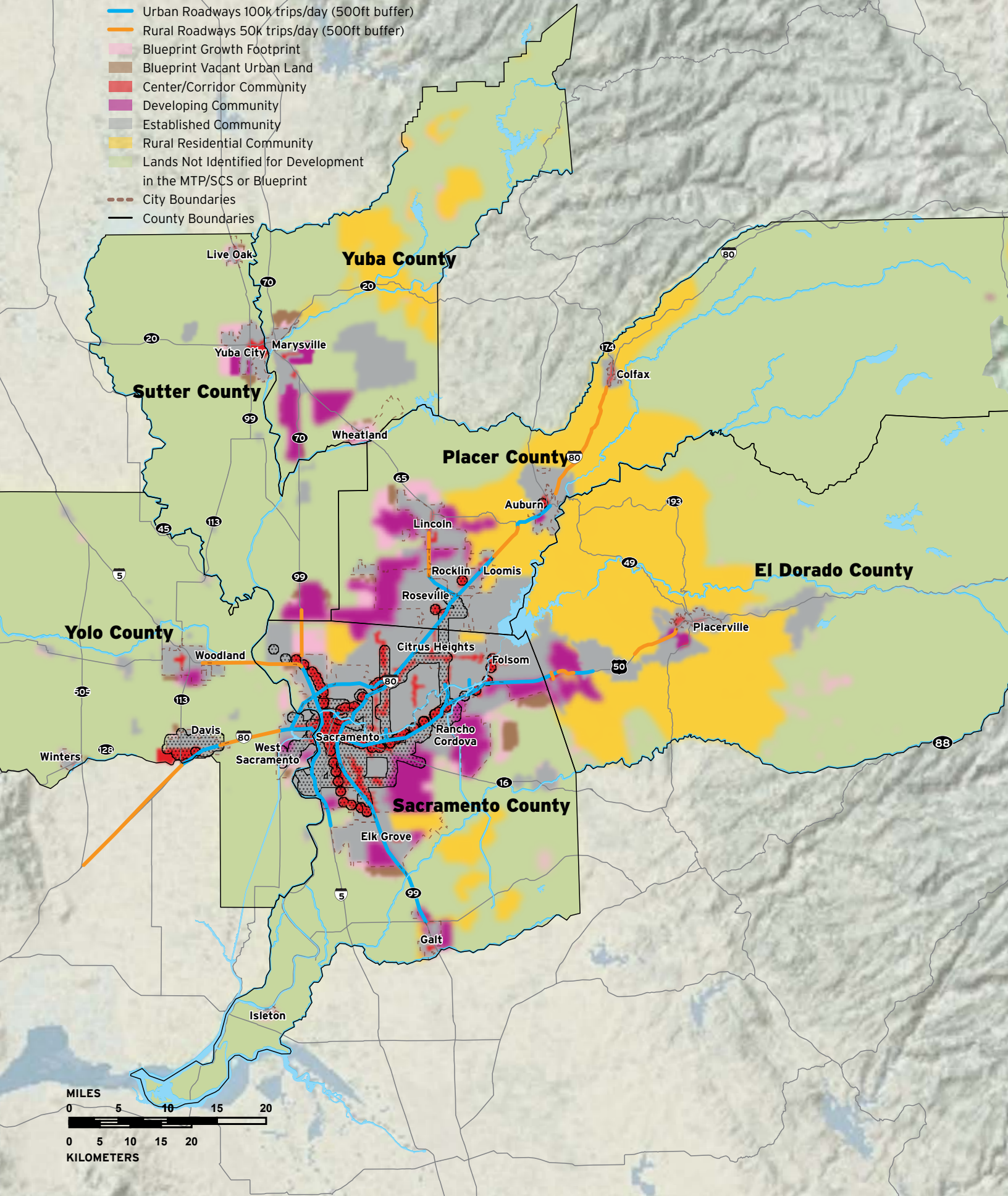
Specifically, the ARB handbook states that sensitive land uses (e.g., homes, schools, day care centers, parks,



Figure 7.5

## 2036 Toxic Air Contaminants

- 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





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 2012, the population within the buffer zone represents only 2.66 percent of the entire region's population. By 2036, the population within the buffer zone will represent only 3 percent of the entire region's population (see Table 7.5). This means that less than half a percent (.42 percent) increase in the expected population will be within these buffer zones. Figure 7.5 shows the location of high-volume roadways in 2036.

TABLE 7.5

**Percent of Population Living within 500-Foot Buffer of an Identified TAC Roadways, 2012 and 2036**

County	2012		2036	
	% of total population		% of total population	
El Dorado	0.68%		0.94%	
Placer	1.89%		1.74%	
Sacramento	3.14%		3.62%	
Sutter	1.83%		1.57%	
Yolo	3.52%		4.42%	
Yuba	2.16%		1.95%	
<b>Region Total</b>	<b>2.66%</b>		<b>3.08%</b>	

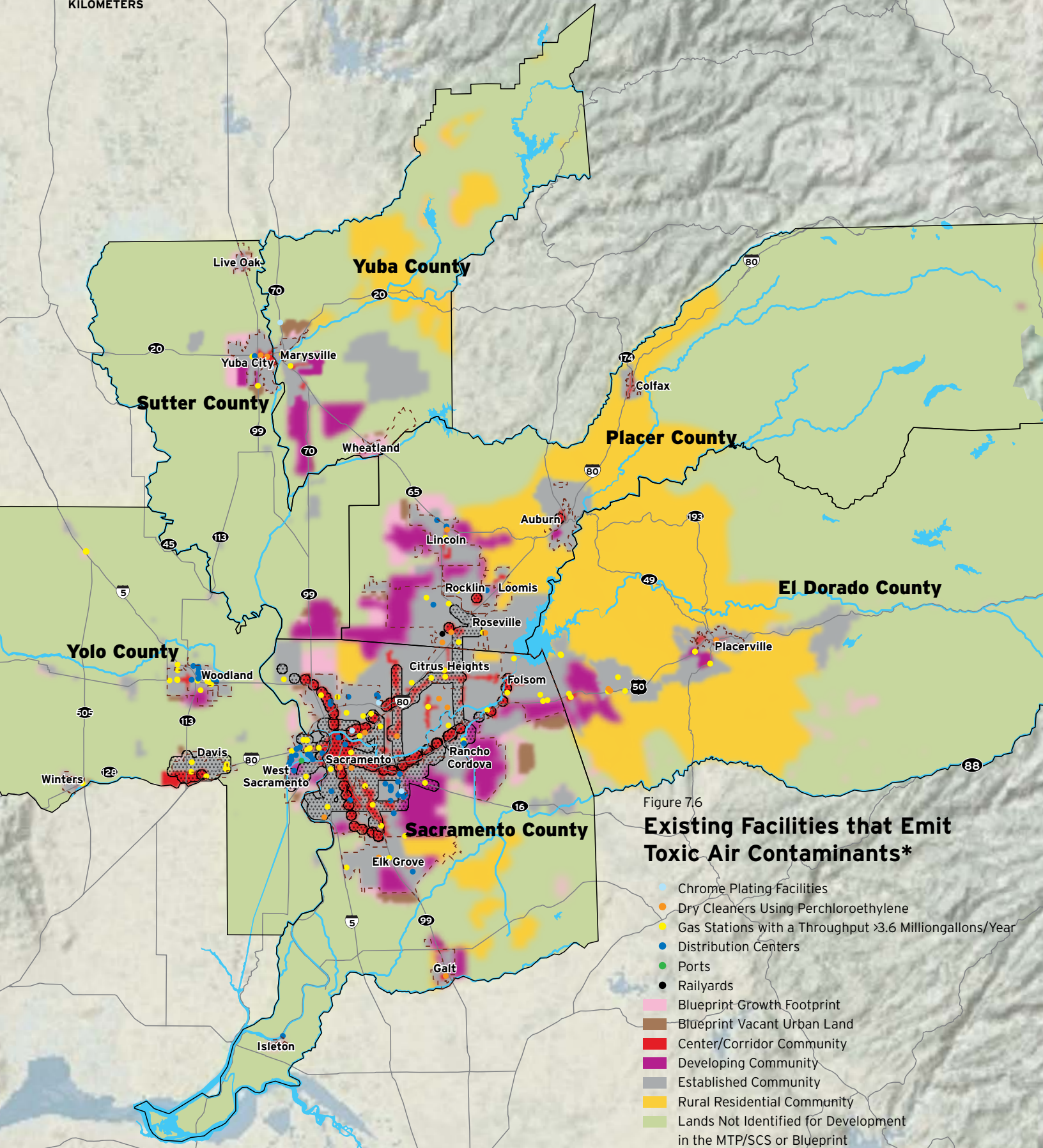
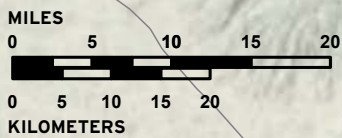


Figure 7.6  
**Existing Facilities that Emit Toxic Air Contaminants\***

- Chrome Plating Facilities
- Dry Cleaners Using Perchloroethylene
- Gas Stations with a Throughput >3.6 Million gallons/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

\*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."

Figure 7.6 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 com-

petitive 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.

## Climate Change: Mitigation and Adaptation

Reducing GHG emissions, the effects they have on climate change, and the related impacts to the region's transportation infrastructure are issues SACOG takes seriously. SACOG has been involved in many emission mitigation efforts around the region. SACOG has conducted its own emissions inventory and assisted in others; was the first American organization to apply the Greenhouse Gas Regional Inventory Protocol (GRIP); adopted the region's first plug-in electric vehicle readiness and infrastructure plan; is working with partner agencies on installing electric vehicle charging stations; 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. SACOG has also started to research climate adaptation strategies as a member of the Capital Region Climate Readiness Collaborative, a cooperative effort to coordinate resiliency programs in the region. In addition, this MTP/SCS contains an assessment of how potential climate change impacts could affect the region's transportation infrastructure and builds a framework for climate adaptation practices to build upon in future plan updates.

### 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.<sup>1</sup> 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.<sup>2</sup> Current levels of atmospheric GHGs exceed 400 parts per mil-

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>

lion.<sup>3</sup> 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.<sup>4</sup>

In the United States, roughly 80 percent of all GHG emissions come from the use of petroleum and natural gas<sup>5</sup>. 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.<sup>6</sup>

The impacts from a change in global climate can be felt throughout the state and 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***

3 Dr. Pieter Tans, NOAA/ESRL ([www.esrl.noaa.gov/gmd/ccgg/trends/](http://www.esrl.noaa.gov/gmd/ccgg/trends/)) and Dr. Ralph Keeling, Scripps Institution of Oceanography ([scrippsco2.ucsd.edu/](http://scrippsco2.ucsd.edu/)).

4 Energy Information Administration, <http://www.eia.gov/oiaf/1605/ggcebro/chapter1.html>

5 Environmental Protection Agency, <http://www.epa.gov/climatechange/Downloads/ghgemissions/US-GHG-Inventory-2015-Main-Text.pdf>

6 Energy Information Administration, <http://www.eia.gov/oiaf/1605/ggcebro/chapter1.html>



*businesses and residences, damage to marine ecosystems and the natural environment, and an increase in the incidences of infectious disease, asthma, and other human 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. As part of their Fifth Assessment conducted in 2013, the IPCC stated that “most aspects of climate change will persist for many centuries even if emissions of CO<sub>2</sub> are stopped. This represents a substantial multi-century climate change commitment created by past, present and future emissions of CO<sub>2</sub>”<sup>7</sup>

The California Environmental Protection Agency (CalEPA) took the IPCC work and built scenarios specific to California that show the impacts different temperature ranges could have on California during the 21st century. Following this work, the state created a series of tools to help conduct local assessments of climate impacts. Cal-Adapt is an online tool developed by the California Energy Commission under a key recommendation of the 2009 California Climate Adaptation Strategy to synthesize and share existing climate science research that can inform local decision-making and adaptation planning. The site provides access to a wealth of scientific data from well-established institutions such as Scripps Institute of Oceanography, Pacific Institute, U.S Geological Survey, UC Berkeley, UC Merced, and Santa Clara University. The data uses IPCC

7 IPCC, 2013: Summary for Policymakers. In: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, US

emission scenarios that are scaled to California's geography.

Work conducted by SACOG using these tools shows that the potential climate impacts most likely to occur in the region are extreme heat, increased risk from wildfire, increased precipitation and runoff, and landslides.

### **Extreme Heat**

An important indicator of heat levels that affect transportation systems is the number of extreme heat days per year. Extreme Heat was set at the threshold of 95°F, as is consistent with numerous statewide climate.<sup>8</sup> SACOG's work shows a significant increase in the number of days over 95°F.

### **WildFire**

In some areas of the region, fire burn risk is expected to increase three to four-fold by 2085. The locations most vulnerable to fire risk are observed in the forested regions of El Dorado County, Placer County, and northern Yuba County.

### **Precipitation and Runoff**

The month of January shows the highest total volume of precipitation and runoff in historical trends and is expected to increase significantly during this century. According to the most extreme climate scenario in Cal-Adapt, in January there will be an approximately 28% increase in precipitation from historical (1980-2010) to projected (2041-2070), averaged across the region. This will cause runoff to increase as much as 117 percent. The highest increases in precipitation are projected in the Placer and El Dorado Counties, while the greatest impacts of runoff occur in the Sierra regions of Placer and El Dorado counties.

### **Landslides**

Exacerbation of landslide risks caused by the combination of more intense wildfires, larger precipitation events, and altered soil moisture will likely impact

8 California Department of Transportation (Caltrans) and Humboldt County Association of Governments (HCOG). 2014: District 1 Climate Change Vulnerability Assessment and Pilot Studies: FHWA Climate Resilience Pilot Final Report. Prepared by GHD



areas that already experience landslide susceptibility. The most vulnerable areas include parts of Placer, El Dorado, and Yolo counties, where there are significant enough slopes and weak enough bedrock to potentially induce a landslide.

### 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.<sup>9</sup> 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

<sup>9</sup> Moving Cooler: An Analysis of Transportation Strategies for Reducing Greenhouse Gas Emissions, Cambridge Systematics, Inc 2009.

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<sup>10</sup>, 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 and then in 2014 updated the Scoping Plan and associated measures. Table 7.6 outlines GHG emissions, expressed in million metric tons of CO<sub>2</sub> equivalents (MMtCO<sub>2</sub>e) and the expected reductions from each. The table includes reduction measures from transportation, and electricity and natural gas sources that will be covered under cap-and-trade. It does not include non-capped measures, which will have little influence on this MTP/SCS.

<sup>10</sup> AB 32 Scoping Plan. California Air Resources Board. <http://arb.ca.gov/cc/scopingplan/scopingplan.htm>

TABLE 7.6  
**Expected California GHG Reductions from Scoping Plan (MMtCO<sub>2</sub>e)**

<b>Measures in Capped Sectors</b>	<b>49.0</b>
<b>Transportation</b>	<b>22.9</b>
T-1 Advanced Clean Cars	3.1
T-2 Low Carbon Fuel Standards	15.2
T-3 Regional Targets (SB 375)	3.0
T-4 Tire Pressure Program	0.6
T-5 Ship Electrification	0.2
T-7 Heavy Duty Aerodynamics	0.9
T-8 Medium/Heavy Hybridization	0.0
<b>Electricity and Natural Gas</b>	<b>25.0</b>
E-1 Energy Efficiency and Conservation	7.8
CR-1 Energy Efficiency and Conservation	4.4
CR-2 Solar Hot Water	0.1
E-3 Renewable Energy Standards	11.5
E-4 Million Solar Roofs	1.1

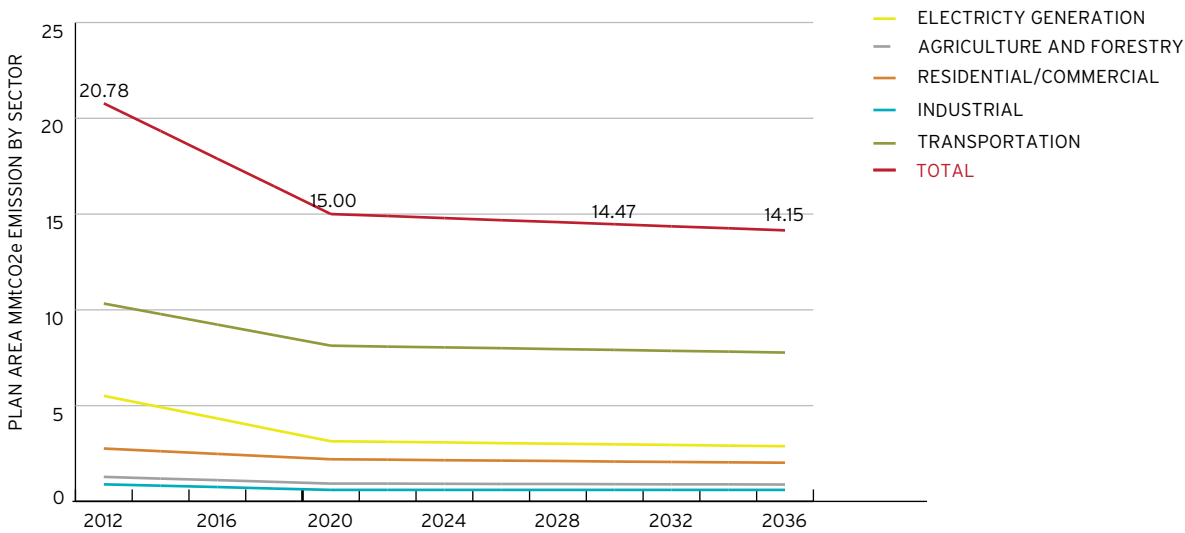
Source: ARB AB 32 Scoping Plan Update, 2014

As part of this MTP/SCS, SACOG conducted an analysis of regional climate change impacts and estimated what emissions were in 1990 and 2005, and 2012, 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 MMtCO<sub>2</sub>e in 2008. Therefore, 19.36 MMtCO<sub>2</sub>e 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 15.00 MMtCO<sub>2</sub>e for the region in 2020. This is 29 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 2036. Therefore, SACOG decided to take this analysis a little further and estimate GHG emissions for the year 2036. 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 15 MMtCO<sub>2</sub>e in the year 2036, an additional 6 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 7.7, which shows GHG emissions from all sectors for the years 2012, 2020, and 2036, 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 7.7  
**Plan Area MMtCO<sub>2</sub>e Emission through 2036**



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 7.7 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 res-

idential 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 seven 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 7.7 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.

TABLE 7.7  
**MTP/SCS Plan Area CO<sub>2</sub> Equivalent Emission  
 Estimates for 2005, 2020 and 2035**

	CO <sub>2</sub> e per Capita (lbs. per day)	Modeled CO <sub>2</sub> Reductions	Off-Model Reductions*	Total Reductions from 2005
2005	22.7	n/a	n/a	n/a
2020	20.6	-6.0%	-1.6%	-7.6%
2035	19.5	-12.4%	-3.2%	-15.58%

\* Off model reductions account for effects of TSM, ITS, TDM, and additional vehicle technology above existing statewide programs projects not accounted for in SACSIM

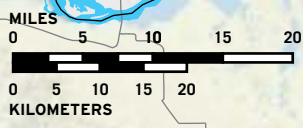
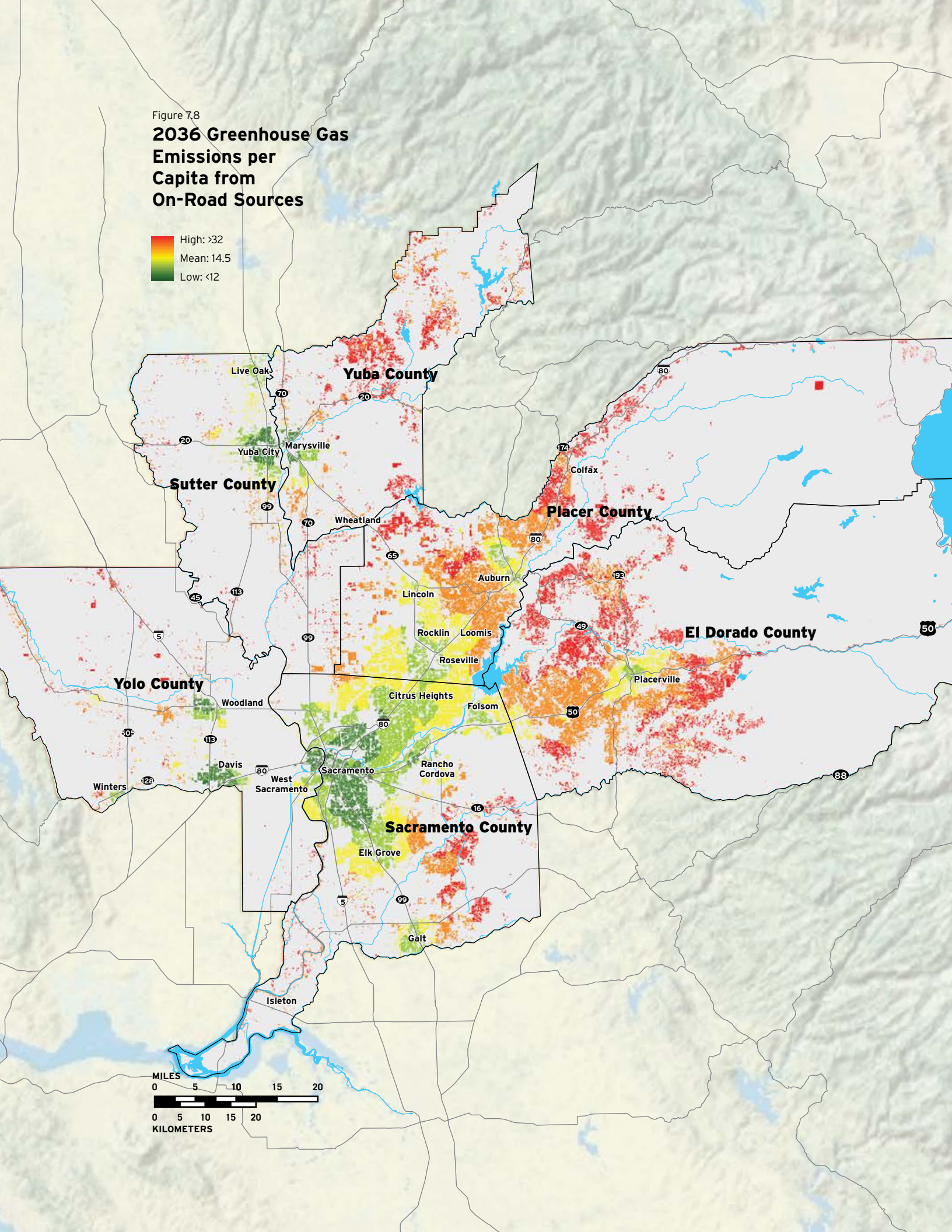
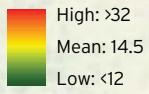
The per capita GHG pounds per day emissions from light-duty cars and trucks for the region were 22.7 in 2005, which sets the benchmark for SB 375 reduction. Based on the development in the MTP/SCS, GHG per capita emissions reduce to 20.6 pounds per day in 2020. This is an 8 percent reduction from 2005 to 2020, below the 7 percent reduction set by ARB. The results for 2035 meet the mark as well, with per capita GHG pounds per day dropping by 16 percent to 19.5 in 2035. GHG emissions from medium and heavy-duty trucks, rail, ship, airplanes, and other transportation sources are not included in this reduction.

How well the MTP/SCS performs at reducing GHG emissions from transportation becomes more apparent when visualized throughout the region. The map in Figure 7.8 shows GHG emissions per capita from on-road sources in 2036. The average emissions for the region are 19.5 pounds per day for each person. Emission values above that norm are colored in darkening shades of red, and values below are shaded green.



Figure 7.8

### 2036 Greenhouse Gas Emissions per Capita from On-Road Sources





### 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. Although lower than the projections used for the 2012 MTP/SCS, recent projections of fuel prices by the federal Department of Energy<sup>11</sup> and the California Energy Commission<sup>12</sup> anticipate that prices will continue to increase in the future. 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 develop-

ing 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, car-pooling, 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 677,400 for weekday travel, which is a 77 percent increase from the 2012 base year. The MTP/SCS was forecasted to increase per capita trips by bike, walk or transit from 0.39 in 2012 to 0.51, a 31 percent increase by 2036. 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".<sup>13</sup>

### 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/SCS, mainly because SB 375 does not allow for advances in technology to

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

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

13 Moving Cooler: An Analysis of Transportation Strategies for Reducing Greenhouse Gas Emissions, Cambridge Systematics, Inc 2009.

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.

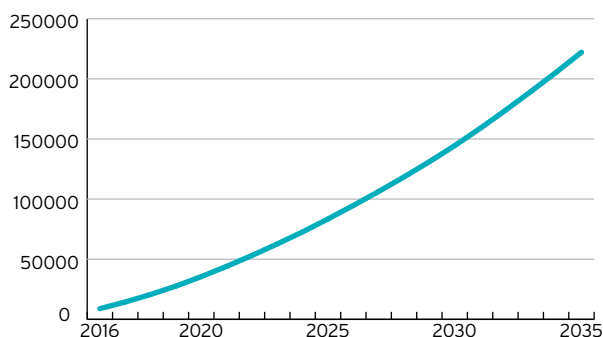
The technological improvements most effective at dealing with global climate change increase fuel efficiency significantly, reduce carbon in fuels, or capture carbon emissions. Major advances in cleaner and more efficient technology are being made. Increased use of cleaner-burning fuels and engines will 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 2036, and vehicle operating costs to use for the MTP/SCS.

Following the adoption of the 2012 MTP/SCS, SACOG conducted a study on the barriers to broader adoption of electric vehicles in the Sacramento region. A subsequent report entitled *Take Charge: Plug-In Electric Vehicle Readiness and Infrastructure Plan for the Sacramento Region* was adopted by the SACOG board of directors in 2014 as the region's first plan outlining strategies related to planning, permitting, and installing electric vehicle chargers. SACOG has since been working with partner agencies, including the Sacramento Municipal Utilities District, on installing a series of chargers within the utility service area.

FIGURE 7.9

### Total Electric Vehicles in the SACOG Region



Before TakeCharge was adopted, there were fewer than 2,000 electric vehicles in the SACOG region. Since then, the region has seen an increase in the use of these vehicles, and now has more than 4,500 on the road. In addition, SACOG estimates this trend will continue throughout the horizon year of the plan. Figure 7.9 outlines this trend.

### Climate Adaptation

The California Natural Resources Agency (CNRA) released in 2009 the California Climate Adaptation Strategy, a multi-sector approach to guide the state's efforts in adapting to climate change, prepared pursuant to Executive Order S-13-08. The report summarizes climate change impacts and recommends adaptation strategies across seven sectors: Public Health, Biodiversity and Habitat, Oceans and Coastal Resources, Water, Agriculture, Forestry, and Transportation and Energy.

In 2010, the Federal Highway Administration (FHWA) began developing a framework for climate change vulnerability assessments that encouraged Metropolitan Planning Organizations (MPOs), Department of Transportation (DOTs), and Federal Land Management Agencies (FLMAs) to include climate change and extreme weather in transportation planning efforts.

In July of 2014, CNRA released *Safeguarding California, Reducing Climate Risks*. This document was an update to the California Climate Adaptation Strategy. The report analyzed potential climate related risks now and forecasted into the future, and outlines measures and policies that can be implemented to reduce the impact these risks may cause.

The California Department of Transportation (Caltrans) has also taken steps to look at climate adaptation issues. In 2013, Caltrans performed a statewide analysis regarding the inclusion of climate adaptability into the transportation system. In its report, *Caltrans Activities to Address Climate Change: Reducing Greenhouse Gas Emissions and Adapting to Impacts*, the agency highlights best practices for climate change adaptation as well as GHG reduction in four sectors: Planning and Environmental; Materials, Concrete, and Pavement; Maintenance and Operations; and Facilities and Administration.

In 2014 SACOG began working with Civic Spark, a collaboration of the Office of Planning and Research, the Local Government Commission, and AmeriCorp, to look at potential climate impacts to the region's transportation infrastructure. An early report entitled *SACOG Climate Change Impacts: Preliminary Results*<sup>14</sup> out-

14 <http://www.sacog.org/mtp/pdf/Climate%20Vulnerability%20Assessment.pdf>

lines the possible climate related impacts to our region and the effects they may have on transportation infrastructure.

Each type of climate change effect may disrupt the transportation system in a number of ways. This section describes the possible consequences of each climate impact.

### **Extreme Heat**

Roadways may buckle and crack due to prolonged high temperatures, becoming unusable.<sup>15</sup> This includes bridges with inadequate thermal expansion joints, which may fail under extreme heat conditions. Asphalt can also deform under high temperatures, creating deep ruts and unsafe conditions.<sup>16</sup> Similarly, railways may buckle from heat due to the expansion of the continuously welded rails.

Extreme temperatures cause significant health impacts. Biking and walking becomes more strenuous during extreme heat days, posing health risks and a possible deterrent for biking and walking. During periods of extreme heat, construction is forced to stop or slow down due to health risk exposures for workers, and because many materials for transportation infrastructure cannot be properly installed above certain temperatures.

A secondary effect of extreme heat is the loss of power to traffic controls. High temperatures decrease the efficiency of power transmission lines, while at the same time demand for electricity is increased for the operation of air conditioners and cooling equipment. The result is a higher risk of blackouts, which in turn shuts down traffic signals and some train operations.

#### **Precipitation and Runoff**

Excess water on the roadway causes immediate hazards of hydroplaning and reduced roadway visibility, posing a danger to drivers and increased frequency of accidents and roadway congestion. In light rain, roadway speeds generally reduce by 2-4%, and in heavy

15 Wilway, T, et al. "The effects of climate change on highway pavements and how to minimize them: Technical report". TRL Limited. 2008

16 *ibid*

rain speeds reduce 4-7%.<sup>17</sup> If water seeps into the pavements, it may also damage the asphalt, causing the material to degrade, crack, and need premature replacement.<sup>18</sup> Depending on the soil type, saturated soils under roadways erode and destabilize the road, leading to washouts or damage.<sup>19</sup>

Additionally, floods can lead to or exacerbate bridge scour. Scour makes the bridge weaker and less safe, and may lead to a need for repairs or replacement. Electrical boxes and other facilities may also be inundated, disrupting service to traffic signals and train operations. During fall storms, leaves will likely wash into the drainage systems, causing more intense localized flooding throughout the region.

### **Wildfire**

Wildfires cause network disruptions including road and airport blockages, closures, and reduced road visibility. Fires may also disrupt power supplies, which impacts the electricity used for rail lines and traffic signals. The smoke and haze created by wildfires decreases air quality, reducing visibility on the road and creating unpleasant and unhealthy conditions for bikers and pedestrians. Fires that cause extremely high temperatures near infrastructure will damage and weaken the infrastructure materials. Effects can include asphalt softening, steel bridge breakdown, and failure of plastic/PVC culverts.

### **Landslides**

Landslides pose immediate hazards for vehicles on roadways and railways. Large or deep-seated landslides can wash out entire sections of road and rail, while smaller landslides may destabilize the subbase or cause cracking and shifting. Even surface-level landslides can cause a substantial amount of mud and debris to flow

17 California Department of Transportation (Caltrans) and Humboldt County Association of Governments (HCOG). 2014: District 1 Climate Change Vulnerability Assessment and Pilot Studies: FHWA Climate Resilience Pilot Final Report. Prepared by GHD

18 Wilway, T, et al. "The effects of climate change on highway pavements and how to minimize them: Technical report". TRL Limited. 2008

19 *ibid*

across roads and railways, blocking traffic or clogging drainage and causing flooding.

### Adaptation Strategies

A robust approach to climate change response should involve both mitigation and adaptation measures. Through the past MTP/SCS processes, SACOG has focused most of its climate related efforts on mitigation, including policies that have taken large steps to reduce emissions and their impacts. The following section addresses potential adaptation options as they relate to transportation infrastructure throughout the region.

- Adopt integrated approaches: Incorporate climate change into existing processes and programs.
- Prioritize the most vulnerable: Help the people, places, and infrastructure that are most at risk.
- Use best-available science: Ground adaptation in scientific understanding.
- Build strong partnerships: Coordinate across multiple sectors, scales, and stakeholders.
- Apply risk-management methods and tools: Use risk-management tools to prioritize options for reducing vulnerability.
- Apply ecosystem-based approaches: Incorporate ecosystem resilience and protection of ecosystem services.
- Maximize mutual benefits: Support other initiatives where possible, such as disaster preparedness or sustainable resource management.
- Continuously evaluate performance: Determine quantifiable goals and metrics and track progress, adjusting strategies as needed.

This early work is intended to be a framework from which later climate adaptation efforts can build upon. Later work can include a more in-depth analysis of potential impacts to ascertain asset-specific vulnerabilities, analysis of overall system adaptability, coordination with emergency management efforts around the region, and assessing and creating climate adaptation strategies and policies for future year plan updates. This would likely include portions of four broad categories of adaptation strategies that can be incorporated. This includes:

- Maintain and manage: Enhance maintenance and repair policies to improve severe event preparedness and response. Manage procedures for monitoring infrastructure and create/update emergency action plans.
- Strengthen and protect: Retrofit existing infrastructure and build new structures that better withstand extreme climate events.
- Enhance redundancy: Identify and create alternatives to vulnerable routes. Utilize different modes of transportation to enhance redundancy.
- Retreat: Relocate or abandon infrastructure located in highly vulnerable areas. Avoid building new infrastructure in vulnerable locations.

Actions toward climate change adaptation range widely, from relatively low-effort management policy changes to expensive and disruptive infrastructure retrofits and replacements. These actions can be broadly categorized into three sectors: Planning, Design, and Maintenance/Operations. Within each of these sectors, actions can be taken toward each of the four previously listed types of adaptation strategies (maintain and manage, strengthen and protect, enhance redundancy, retreat). The following table summarizes potential adaptation options in each sector for the climate change effects expected to occur in the SACOG region.

FIGURE 7.10  
**Adaptation Strategies to Address Potential Climate Change Impacts**

		Extreme Temperature		Precipitation, Runoff, Flooding		
	plan	design	maintenance	plan	design	maintenance
Roadways		Use heat and rut-resistant materials	Implement asset management system, increase monitoring and maintenance schedules	Identify alternative routes to vulnerable and critical routes, limit development in floodplains, conduct risk assessments	Protect evacuation routes, use different asphalt/concrete mixtures, pavement grooving and sloping	Implement asset management system, increase monitoring and maintenance schedules
Railways	Change design standards on maximum temperatures	Design joints for higher maximum temperatures	Increase monitoring and lighten train loads and reduce speeds		Upgrade drainage system and increase culvert capacity	
Bridges		Design joints for higher maximum temperatures, use heat and rut-resistant materials	Implement asset management system, increase monitoring and maintenance schedules	Identify alternative routes to vulnerable and critical routes, limit development in floodplains, conduct risk assessments	Protect bridge piers and abutments, protect evacuation routes, use different asphalt/concrete mixtures, pavement grooving and sloping	Implement asset management system, increase monitoring and maintenance schedules
Walking & Biking	Provide shade, create safe alternative routes					
Drainage				Restrict development in floodplains, conduct risk assessments	Upgrade drainage systems/increase standard drainage capacity, increase water storage systems	Increase monitoring and maintenance schedules, ensure systems are clear during extreme precipitation, increase capacity of pumps, minimize repair backlogs
Traffic Flow	Incentivize alternative modes and teleworking			Identify alternative to vulnerable and critical route		
Public Transit	Provide shade, use alternative fuels, encourage carpools					
Buildings & Facilities			Increase monitoring schedule, shift to evening work schedules		Weatherproof equipment and install higher	Increase monitoring and maintenance
Traffic Controls	Plan alternative traffic control measures			Plan alternative traffic control measures		



		Wildfire			Landslides		
		plan	design	maintenance	plan	design	maintenance
Roadways		Identify alternative to vulnerable and critical routes, update emergency improvement plans,	Use heat resistant materials, protect electrical equipment	increase monitoring and maintenance schedules, repair damage as needed	Identify alternative to vulnerable and critical routes, update emergency improvement plans	Protect evacuation routes, ensure adequate drainage on roadbed surfaces and shoulders, incorporate rock fall protection, implement slope hardening	Implement asset management system, increase monitoring and maintenance schedules, ensure roadway is clear of rocks, debris, vegetation, minimize repair backlogs
Railways							
Bridges		Identify alternative to vulnerable and critical routes, update emergency improvement plans,	Use heat resistant materials, protect electrical equipment				
Walking & Biking							Identify alternative to vulnerable and critical routes
Drainage			Use heat resistant materials				Implement asset management system, increase monitoring and maintenance schedules, minimize repair backlogs
Traffic Flow		Identify alternatives to vulnerable and critical routes			Identify alternative to vulnerable and critical routes, update emergency improvement plans	Protect evacuation routes	
Public Transit							
Buildings & Facilities							
Traffic Controls							

## CHAPTER 8

# Equity and Choice

## Introduction

SACOG is required by law to conduct an environmental justice and Title VI analysis as part of the MTP/SCS, to determine whether the MTP/SCS benefits low-income and minority communities equitably, whether the Plan's transportation investments have any disproportionate negative effects on minority and/or low-income populations in the SACOG region, and whether the plan has disparate impacts on the basis of race, color, or national origin. These environmental justice areas will be referred to throughout this chapter as Low Income High Minority (LIHM) Areas.

While Chapter 5 analyzes the general performance of the MTP/SCS, this chapter provides SACOG's environmental justice and Title VI analysis. The chapter seeks not only to fulfill SACOG's legal requirements to analyze environmental justice and Title VI 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 and regulatory requirements for environmental justice analysis
- How Low Income/High Minority (LIHM) Areas are defined for SACOG's analysis
- Characteristics of LIHM Areas
- Analysis of LIHM Area impacts of the MTP/SC
- FTA guidance and findings for Title VI analysis
- Plan implementation efforts and strategies for enhancing analytical capacity and expertise.

## Legal and Regulatory Framework

### Planning Process and Required Environmental Justice Analysis

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."<sup>1</sup> In 1997, the Department of Transportation followed up with an Order on Environmental Justice<sup>2</sup> designed to implement the Executive Order.

In December 1998, the Federal Highway Administration (FHWA) issued its own environmental justice order.

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](http://www.fhwa.dot.gov/environment/environmental_justice/facts/dot_ord.cfm)

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.
- 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 2016 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 for the MTP/SCS planning process. The engagement process provides 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. The current PPP was adopted in August of 2013.

As part of the development process for the 2016 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 the 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 low-income, minority, and underrepresented residents, SACOG not only used the legally required techniques described in Chapter 2: The Planning Process but also sought out underrepresented residents not included in the environmental justice statute.

Key efforts included:

- Ongoing consultation with a stakeholder Sounding Board, including representatives from equity, public health, affordable housing, senior, disabled, and human service groups, described in more detail in Chapter 2.
- Translation of MTP/SCS workshop fliers for all locations into Spanish, the most common non-English language spoken in the region.
- On-site Spanish translation.
- Outreach through transit-accessible and popular local community events, with opportunities for education, one-on-one conversation, and completing preference surveys.
- An on-line version of the public workshop and survey in Spanish and English.
- A scientific telephone poll of 1,600 residents representative of the region's demographic diversity.
- Consideration of findings and recommendations from recent Short Range Transit Plan updates, Unmet Transit Needs hearings, and a 2011 SACOG study assessing the needs of transit-dependent residents in the region to reach essential or "life-line" destinations.<sup>3</sup>

For more information related specifically to the 2016 MTP/SCS workshops, see Chapter 2: The Planning Process.

## Low Income High Minority Area Definition

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

<sup>3</sup> SACOG, Outreach and Analysis of Transit Dependent Needs, February 2011, [www.sacog.org/transit/lifelinetransitstudy.cfm](http://www.sacog.org/transit/lifelinetransitstudy.cfm)

assessing environmental justice issues in transportation plans, particularly in a state like California where minority individuals are the majority of residents.”<sup>4</sup>

In 2011, SACOG received a three-year Regional Planning for Sustainable Development 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 had the opportunity to work with faculty and students of the UC Davis Center for Regional Change (CRC) on enhanced equity indicators and performance measures to inform SACOG’s equity analyses for the MTP/SCS. CRC’s work included assistance on defining low-income, minority and vulnerable areas to reflect the growing diversity of the six-county region.

Population data from the 2010 Census Survey showed that the Sacramento region had 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. New five-year (2009-2013) data for the Sacramento region recently became available from the American Community Survey (ACS), which provides more detailed data at the Census block group level. 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 45 percent of the region’s population.

**TABLE 8.1**  
**Minority Population in the SACOG Region, 2000-2010**

	Total Minority Population 2000 Census	Total Minority Population 2010 Census	Total Minority Population ACS 2009-13
El Dorado	15%	20%	20%
Placer	17%	24%	25%
Sacramento	42%	52%	52%
Sutter	40%	50%	50%
Yolo	42%	50%	51%
Yuba	35%	41%	42%
<b>Region</b>	<b>36%</b>	<b>44%</b>	<b>45%</b>

Source: U.S. Census Data

SACOG staff worked with the stakeholder Sounding Board to confirm the following definitions for Low Income High Minority (LIHM) Areas for this equity analysis, using the newer 2009-13 ACS block group data available since the last plan:

- **Low-Income Communities:** Census Block Groups where 45 percent or more of the population earns 200 percent or less of the federal poverty level. Block groups meeting this threshold include about 29 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. Block groups meeting this threshold include about 8 percent of the region’s population.
- **Vulnerable Communities:** Block groups in the region that, 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

4 California Department of Transportation, Environmental Desk Guide, [www.dot.ca.gov/hq/tpp/offices/ocp/ej\\_titlevi\\_files/EnvironmentalJusticeDeskGuideJan2003.pdf](http://www.dot.ca.gov/hq/tpp/offices/ocp/ej_titlevi_files/EnvironmentalJusticeDeskGuideJan2003.pdf)



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 adds to the LIHM Areas three block groups totaling about 6,000 people. Combined, the total population of the resulting LIHM Areas is about 32 percent of the total regional population.

A more in-depth technical review of the methodology used to identify LIHM Areas is contained in Appendix C-5 – Low Income and High Minority Areas Methodology.

## LIHM Area Characteristics

Of the 1,427 block groups in the region, 426 make up the region's LIHM Areas. A total of 350 block groups meet low-income criteria alone and 44 meet both low-income and minority criteria, totaling 89 percent of the LIHM Area population. Another 25 block groups meet minority community criteria alone, with 10 percent of the LIHM Area population. Seven block groups meet vulnerability criteria alone, with 0.8 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.

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 LIHM 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.

It is also important to note that:

- Whether areas qualify as "LIHM" or "Non-LIHM" depends on thresholds for block groups 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 LIHM Areas. There are also low-income and minority residents who live in Non-LIHM Areas.
- Although increasing proportions of Hispanic and Asian residents are forecasted for the region, with its current analytical tools, SACOG is not able to predict where future minority populations - or low-income populations - will locate in future. As a result, for purposes of this analysis, SACOG assumes that the areas in the 2012 base year that qualify as LIHM Areas will be the same in 2036. This means that SACOG analyzes performance measures for all residents of the same LIHM and Non-LIHM geographies in 2012 and 2036, but cannot meaningfully say whether the residents of those areas will continue to have the same minority, income and/or vulnerability characteristics in 2036 as in 2012. Since projections are that the Sacramento region will continue to become

more diverse, the populations living in what are now defined as LIHM or Non-LIHM Areas will likely be different in 2036. 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 LIHM Area analysis for later years may understate benefits or overstate impacts for 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/SCS 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."<sup>5</sup> The MTP/SCS considered improvements to meet youth transportation needs as well.

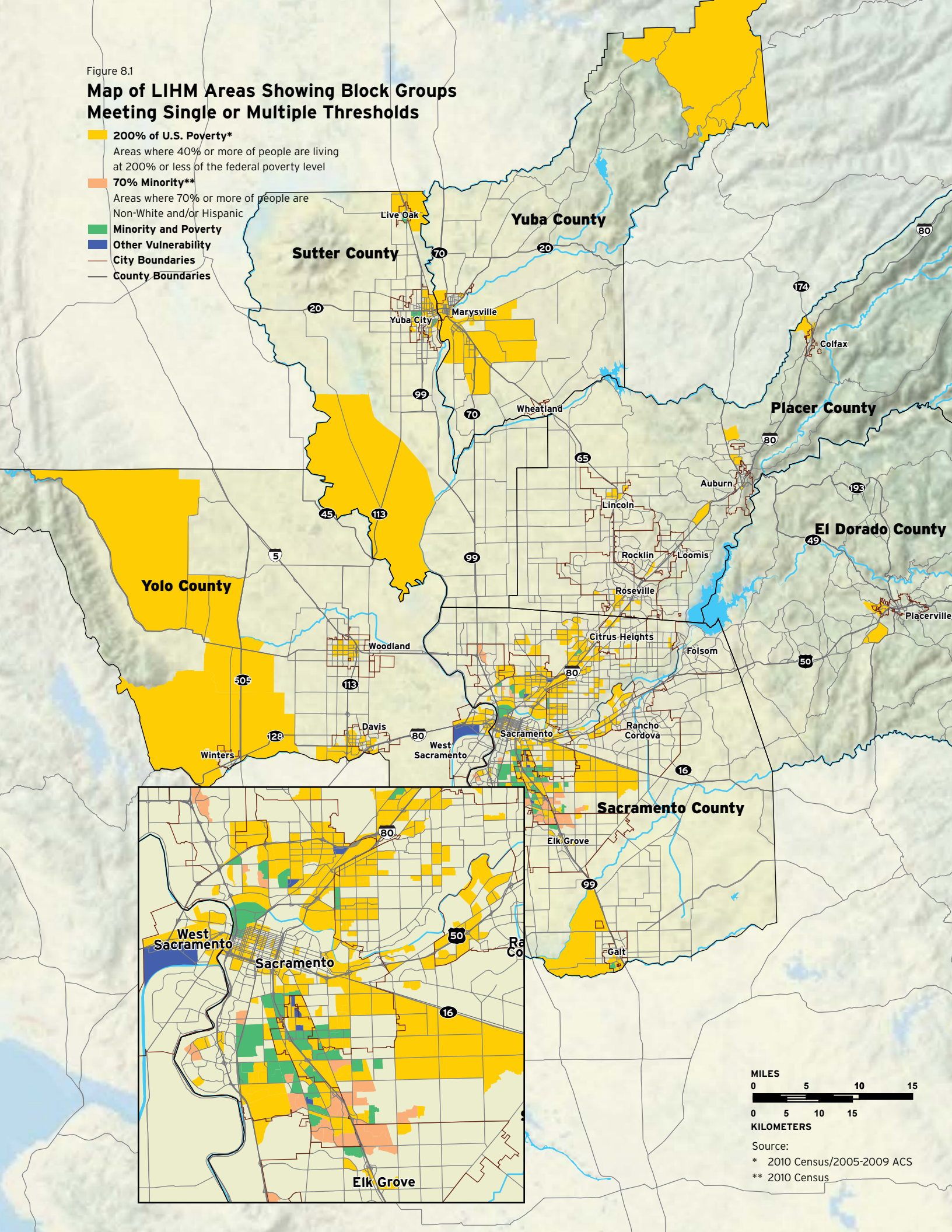
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5 Center for Regional Change, Healthy Youth/Healthy Regions: Informing Action for the 9 County Capital Region and its Youth, July 2011, p. 19

Figure 8.1

### Map of LIHM Areas Showing Block Groups Meeting Single or Multiple Thresholds

- **200% of U.S. Poverty\***  
Areas where 40% or more of people are living at 200% or less of the federal poverty level
- **70% Minority\*\***  
Areas where 70% or more of people are Non-White and/or Hispanic
- **Minority and Poverty**
- **Other Vulnerability**
- City Boundaries**
- County Boundaries**



MILES  
0 5 10 15  
KILOMETERS  
0 5 10 15  
Source:  
\* 2010 Census/2005-2009 ACS  
\*\* 2010 Census

TABLE 8.2

**Demographic Information for LIHM vs. Non-LIHM 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
<b>El Dorado County*</b>										
LIHM Analysis Areas	2.9	50%	72%	2%	1%	1%	0%	0%	2%	21%
Non-LIHM Areas	2.7	19%	83%	1%	1%	4%	0%	0%	3%	9%
<b>Placer County*</b>										
LIHM Analysis Areas	2.8	55%	63%	1%	1%	2%	0%	0%	3%	30%
Non-LIHM Areas	2.7	18%	77%	1%	0%	7%	0%	0%	3%	11%
<b>Sacramento County</b>										
LIHM Analysis Areas	2.9	58%	33%	14%	1%	16%	1%	0%	5%	30%
Non-LIHM Areas	2.6	25%	57%	7%	0%	14%	1%	0%	4%	17%
<b>Sutter County</b>										
LIHM Analysis Areas	3.1	60%	38%	1%	1%	14%	0%	0%	4%	41%
Non-LIHM Areas	2.8	29%	60%	2%	1%	14%	0%	0%	4%	19%
<b>Yolo County</b>										
LIHM Analysis Areas	2.7	58%	42%	2%	0%	16%	0%	0%	4%	35%
Non-LIHM Areas	2.8	27%	54%	3%	1%	10%	1%	0%	4%	28%
<b>Yuba County</b>										
LIHM Analysis Areas	3.1	63%	48%	3%	1%	7%	0%	1%	5%	34%
Non-LIHM Areas	2.8	32%	67%	3%	1%	7%	0%	0%	4%	18%
<b>Region</b>										
LIHM Analysis Areas	2.9	58%	37%	11%	1%	15%	1%	0%	4%	31%
Non-LIHM Areas	2.7	24%	64%	5%	1%	11%	0%	0%	4%	16%

Source: U.S. Census Bureau, 2009-2013 American Community Survey (ACS)

\* Does not include Lake Tahoe portions of either county.

Key characteristics of LIHM analysis areas include:

- About 32 percent of the region's population lives in the defined LIHM Areas. With the five-year ACS data that became available between the 2012 MTP/SCS and this plan, El Dorado County and Placer County now have defined LIHM Areas because of income data available at the Census Block Group level, described more fully in Appendix C-5. As a result of this block group detail, communities with low-income residents are now observed within the context of larger census tracts that do not meet the thresholds.
- People in the LIHM Areas are more than twice as likely to be classified as low income as people in other areas.
- Between the 2012 plan and this plan update, the number of block groups increased from 386 to 426 where 45 percent or more of the population earns 200 percent or less of the federal poverty level. This likely reflects both the more detailed data from the ACS and the effects of the recession on many households' income.
- The number of block groups in the region meeting both low-income and minority criteria decreased from 112 to 44, and the number meeting the 70 percent minority threshold alone decreased from 106 to 25 block groups, highlighting the increasing diversification of the region discussed later in this section.
- Households in LIHM Areas tend to use transit, walking and bicycling at significantly higher rates than Non-LIHM households – more than twice the rate for transit use and a 55 percent greater rate for walking and bicycling region-wide. Table 8.3 shows regional mode shares from SACOG's travel demand model for both LIHM and Non-LIHM Areas. This also indicates that, while less than Non-LIHM Areas, the large majority of LIHM Area residents use personal vehicles for transportation.

TABLE 8.3

**Comparison of Non-Auto Mode Shares between LIHM and Non-LIHM Areas, 2012**

Area Type	Transit	Bicycle & Walk
LIHM Areas	2.0%	13.2%
Non-LIHM Areas	0.9%	7.5%



## Analysis of LIHM 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 LIHM Areas compared with Non-LIHM Areas.

### 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. The MTP/SCS projects significant growth in both housing and employment in Center and Corridor Communities and Established Communities, with these infill areas also supported by a greater mix of uses and transportation options.

In 2012, nearly one-fifth of the population of LIHM Areas lived in Centers and Corridors and over three-quarters in Established Communities. By 2036 over 223,000 more people in LIHM Areas and 588,000 people in Non-LIHM 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, about 27 percent of the LIHM Area population and 8 percent of the

Non-LIHM Area population will be in Centers and Corridors and about two-thirds of both LIHM and Non-LIHM Area population will be in Established Communities. Table 8.4 shows these shifts between 2012 and 2036. The other major increase of Non-LIHM Area population will be in Developing Communities.

TABLE 8.4

### LIHM and Non-LIHM Area Population in Community Types, 2012 and 2036

	Community Type Percent of LIHM Area population in 2012	Percent of LIHM Area population in 2036	Percent of Non-LIHM Area population in 2012	Percent of Non-LIHM Area population in 2036
Center/Corridor	19%	27%	7%	8%
Established	77%	67%	78%	66%
Developing	2%	5%	5%	17%
Rural Residential	2%	1%	10%	9%

### Population in Transit Priority Areas

MTP/SCS 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. As shown in Table 8.5, 36 percent of Placer County's LIHM Area residents, and over 60 percent of Sacramento and Yolo county's LIHM Area residents lived in TPAs in 2012.

By 2036, LIHM Area population in Placer, Sacramento and Yolo counties is expected to grow by 32 percent

overall, but with a 40 percent increase in the population and 38 percent increase in the jobs within TPAs in those counties. This provides minority, low-income, or other residents of LIHM Areas with greater opportunities to live and/or work near quality transit.

The population and employment growth in TPAs also benefits Non-LIHM Areas, where population overall is expected to grow by 37 percent, with an 18 percent increase in the population and 40 percent increase in jobs in TPAs in the three counties. This should provide new opportunities for residents who live in Non-LIHM Areas to live and/or work near transit as well, including minority or low-income individuals.

TABLE 8.5

### Comparison of LIHM and Non-LIHM Areas with Transit Priority Areas, 2012 and 2036

County	Population		Jobs	
	LIHM Area % In TPA	Non-LIHM Area % In TPA	LIHM Area % In TPA	Non-LIHM Area % In TPA
<b>2012</b>				
El Dorado	0%	0%	0%	0%
Placer	36%	9%	44%	33%
Sacramento	62%	31%	80%	54%
Sutter	0%	0%	0%	0%
Yolo	61%	44%	56%	48%
Yuba	0%	0%	0%	0%
Region	54%	23%	67%	43%
<b>2036</b>				
El Dorado	0%	0%	0%	0%
Placer	37%	7%	46%	27%
Sacramento	64%	29%	78%	49%
Sutter	0%	0%	0%	0%
Yolo	68%	44%	62%	51%
Yuba	0%	0%	0%	0%
Region	57%	21%	68%	38%

### 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."<sup>6</sup> 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. A 2013 report by Dowell Myers and Michael Pitkin for the Research Institute for Housing America and Mortgage Bankers Association, found that between 2000 and 2010, immigrants accounted for 82 percent of the growth in homeownership in California. This reinforces the likelihood of increasing demographic diversification across the region's current LIHM and non-LIHM Areas and Community Types over the planning period. 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). Changing housing demand plus California's unique law, with its emphasis on housing for all income groups as one of its factors and the requirement that the SCS and RHNA must be consistent with each other, may also mean more increasing income diversity in what are currently LIHM and non-LIHM 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 nearly 165,000 new homes and over 367,000 new jobs in Center and Corridor and Established Communities, where LIHM Area populations are expected to increase significantly, as well as nearly 115,000 homes and 69,000 jobs in Developing Communities. The MTP/SCS projects 37 percent of new housing units and 42 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 2012, 64 percent of the region's housing stock was large-lot single family, with 11 percent small-lot single family homes, and 25 percent attached - such as condominiums, townhomes, apartments, and lofts. In 2014, SACOG updated its Trends in the Housing Market, which can be found in Appendix E-3 - Land Use Forecasting Background Documentation. The report identifies several major factors that will likely change the demand for these housing types in the region over the plan period:

- The two largest age cohorts are the Baby Boomer generation (born between 1946 and 1964) and

6 Myers, Dowell, *Immigrants and Boomers: Forging a New Social Contract for the Future of America*, Russell Sage Foundation, 2007, pp. 4-5.

the Millennial generation (born between 1981 and 1999). According to 2012 projections for California's population made by John Pitkin and Dowell Myers of USC's Population Dynamics Research Group, those age 65 and over will increase from 11 percent of California's population in 2010 to 15 percent in 2020 and 20 percent in 2035.

- Housing surveys show growing preferences among older adults for downsizing, small lot single family homes and attached products, transit, walking and biking options, proximity to shopping, parks, and services, and renting rather than owning.
- The majority of the region's population growth will come from immigrants and their offspring. Hispanic and Asian residents will be the largest growth groups, continuing the trends since 2000. Pitkin and Myers project that Hispanic residents will increase from 38 percent of California's population in 2010 to 55 percent in 2020 and 56 percent in 2035, while Asian/Pacific Islander residents will increase from 14 percent of California's population in 2010 to 17 percent in 2020 and 22 percent by 2035.
- Asian, Hispanic, and African-American residents tend to form fewer households because of a higher prevalence of intergenerational living. In 2012,

about 25 percent of Hispanic and African-American residents and 27 percent of Asian-Americans lived in households with at least two adult generations, compared with 14 percent of Caucasians.

- Household formation rates are lower for younger age groups. In 2012, 36 percent of the nation's millennials were living with their parents, the highest proportion in 40 years. The median age of first marriage is rising and women are delaying having children.
- One-person households will likely continue to grow over the next several decades, particularly among older adult households.

These population shifts suggest 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, and that 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 2036, the MTP/SCS plans for these demographic shifts by increasing the proportion of small-lot and attached homes to 62 percent of the new housing stock in LIHM Areas, and 37 percent of the new housing options in Non-LIHM Areas.

TABLE 8.6

### Housing Product Mix, 2012 and 2036 by LIHM and Non-LIHM Area

	Rural Residential	Large-Lot Single Family	Small-Lot Single Family	Attached	Small Lot Plus Attached
<b>LIHM AREAS</b>					
Share of LIHM Area homes by type, 2012	2%	44%	13%	41%	54%
Share of total homes in LIHM Areas by type, 2036	1%	36%	15%	48%	62%
<b>NON-LIHM AREAS</b>					
Share of Non-LIHM Area homes by type, 2012	11%	61%	11%	18%	29%
Share of total homes in Non-LIHM Areas by type, 2036	9%	55%	15%	22%	37%

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 LIHM and Non-LIHM Area residents, including accessibility from LIHM and Non-LIHM 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

Between 2008 and 2012, transit revenues dropped, which required transit funding adjustments in the 2012 MTP/SCS. Because LIHM 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 LIHM Areas.

Although the 2012 MTP/SCS contained a 17 percent reduction (10 percent per capita) in transit expenditures from the 2008 MTP, it still nearly doubled vehicle service hours regionwide compared with the 2008 base year. With the fix-it-first orientation of this plan update, transit capital investments increase by 6 percent to address needs for keeping transit vehicles and facilities in a state of good repair. Expenditures for transit operations remain consistent with the 2012 plan. Service hours on buses serving LIHM Areas still increase by 111 percent; service hours on rail and bus routes that serve LIHM Areas increase by 108 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 2036.

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 LIHM 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 LIHM as well as non-LIHM 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 2036 that contain a large share of the new jobs, shopping and medical facilities. The MTP/SCS connects existing and new activity centers with numerous proposed bus rapid transit corridors. While routes provide regionwide benefits, corridors directly serving LIHM 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.



Figure 8.2

### 2036 Transit Network Compared with LIHM and Non-LIHM Areas

**200% of U.S. Poverty\***

Areas where 40% or more of people are living at 200% or less of the federal poverty level

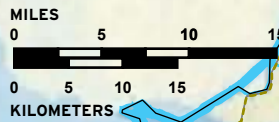
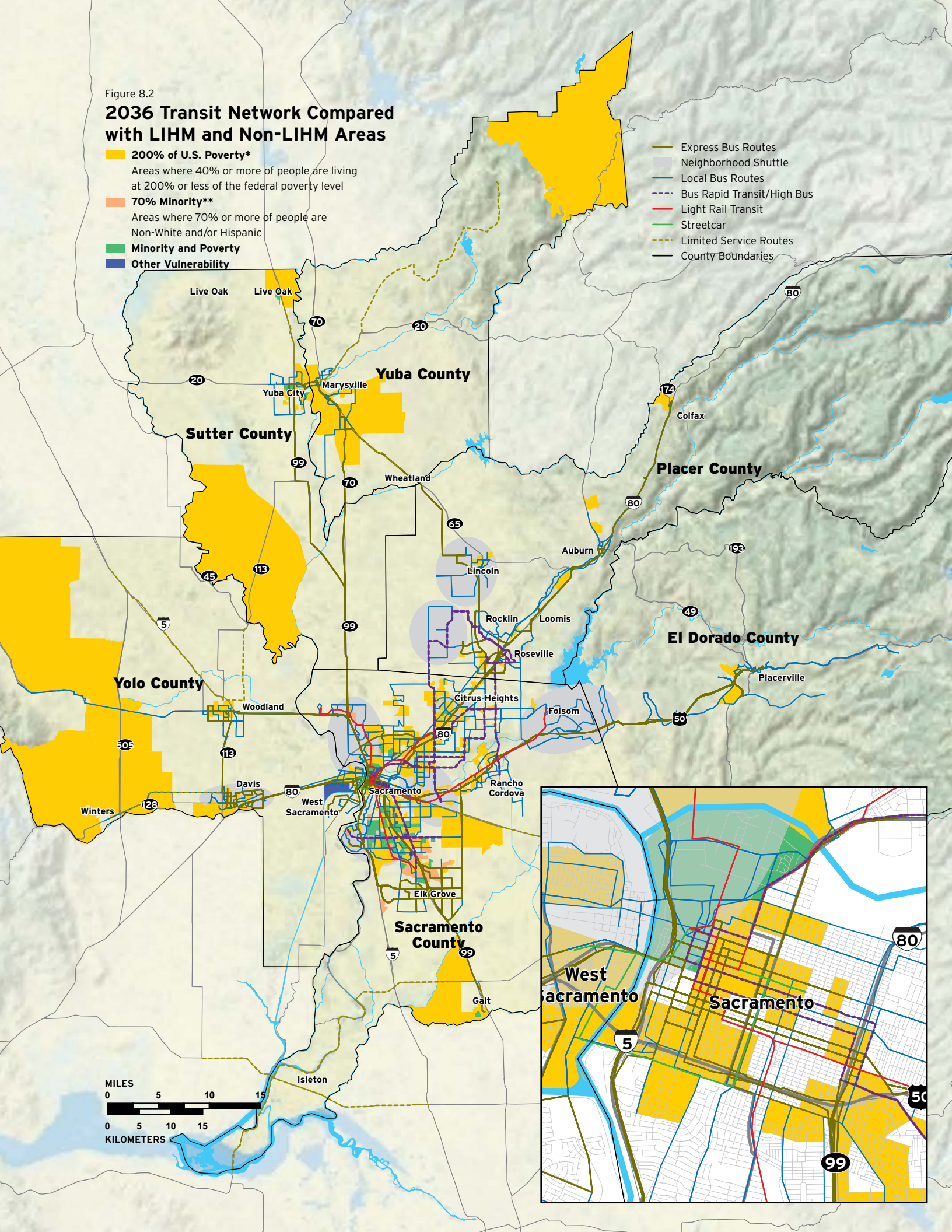
**70% Minority\*\***

Areas where 70% or more of people are Non-White and/or Hispanic

**Minority and Poverty**

**Other Vulnerability**

- Express Bus Routes
- Neighborhood Shuttle
- Local Bus Routes
- Bus Rapid Transit/High Bus
- Light Rail Transit
- Streetcar
- Limited Service Routes
- County Boundaries



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 2036 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. Additionally, Connect Card, the region’s new transit smart card fare collection system, is planned to roll out on nine transit agencies in 2016. It will offer customers easier connections between transit vehicles and systems, as well as free card registration and balance protection in case of loss or theft.

Chapter 4 provides additional detail on transit investments in the plan. Chapter 10 and Appendix B-1 - Financial Plan discuss some of the ongoing transit funding challenges facing the region.

### Transit Accessibility

LIHM 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 LIHM and Non-LIHM Areas. This section assesses changes in transit access to a variety of destinations, including jobs, medical services, 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 2012 and 2036 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 LIHM or Non-LIHM Areas in a particular county.

### Job Access

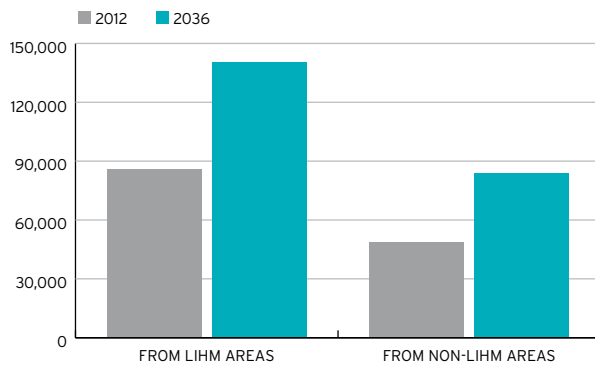
Transit access to jobs between 2012 and 2036 improves for both LIHM and Non-LIHM Areas. Regionwide between 2012 and 2036, as shown in Figure 8.3, jobs accessible within 30 minutes via transit increase by 64 percent from LIHM Areas, and 71 percent from Non-LIHM Areas, using the weighted average methodology described above.

Access by transit to retail jobs also improves for LIHM and Non-LIHM Areas. Projections of retail job growth are developed starting with a regional estimate of retail demand. 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.

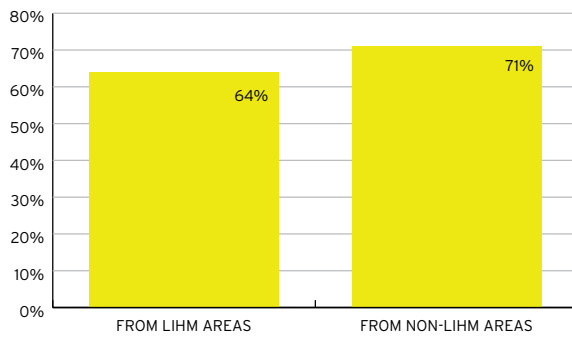
As shown in Figure 8.3, between 2012 and 2036, retail jobs accessible by transit from LIHM Areas increase by 47 percent and from Non-LIHM Areas by 45 percent.

**FIGURE 8.3**  
**Increase in Jobs Accessible within 30-Minute Transit Travel Time**

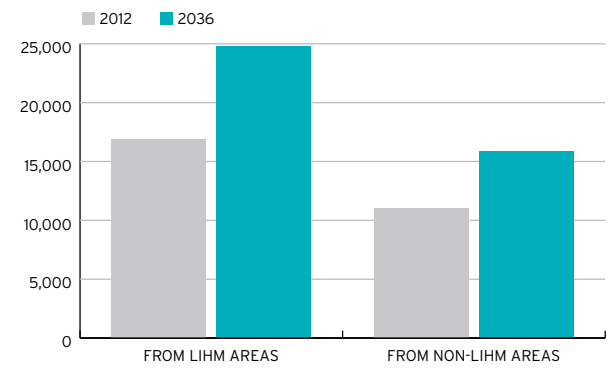
**Transit Access to Jobs**



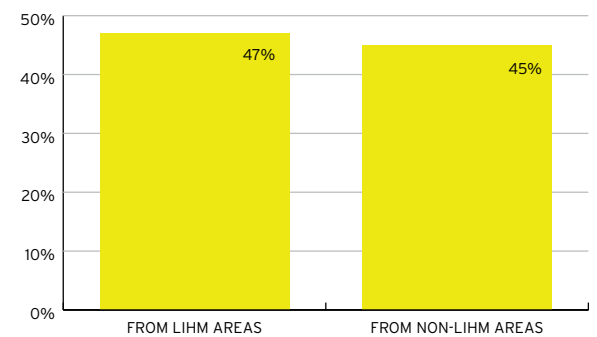
**Increase in Jobs Accessible by Transit**



**Transit Access to Retail Jobs**



**Increase in Retail Jobs Accessible by Transit**

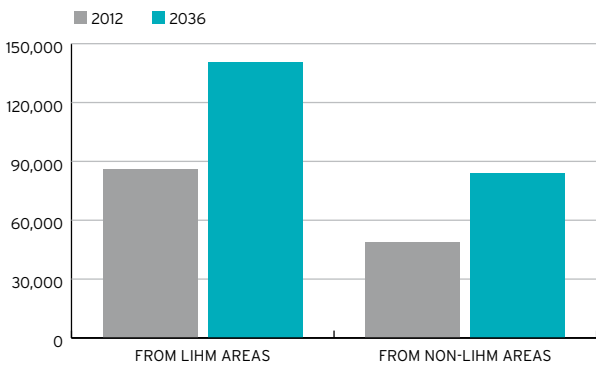


**Access to Medical Care**

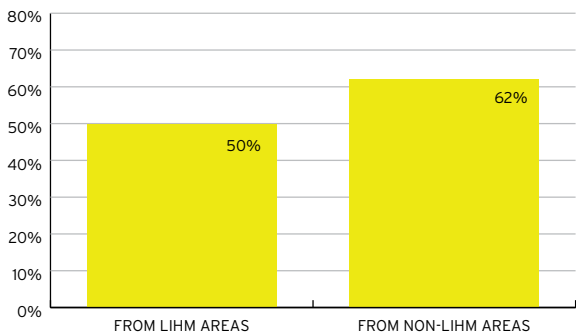
Access by transit to medical services as measured by access to medical-related jobs also improves by 50 percent from LIHM Areas and 62 percent from non-LIHM Areas between 2012 and 2036 as illustrated in Figure 8.4.

**FIGURE 8.4**  
**Transit Access to Medical Jobs**  
 Increase in Medical Jobs Accessible within 30-Minute Transit Travel Time

**Transit Access to Medical Jobs**



**Increase in Medical Jobs Accessible by Transit**



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 2036. Figure 8.5 shows the location of medical jobs throughout the region in 2012.

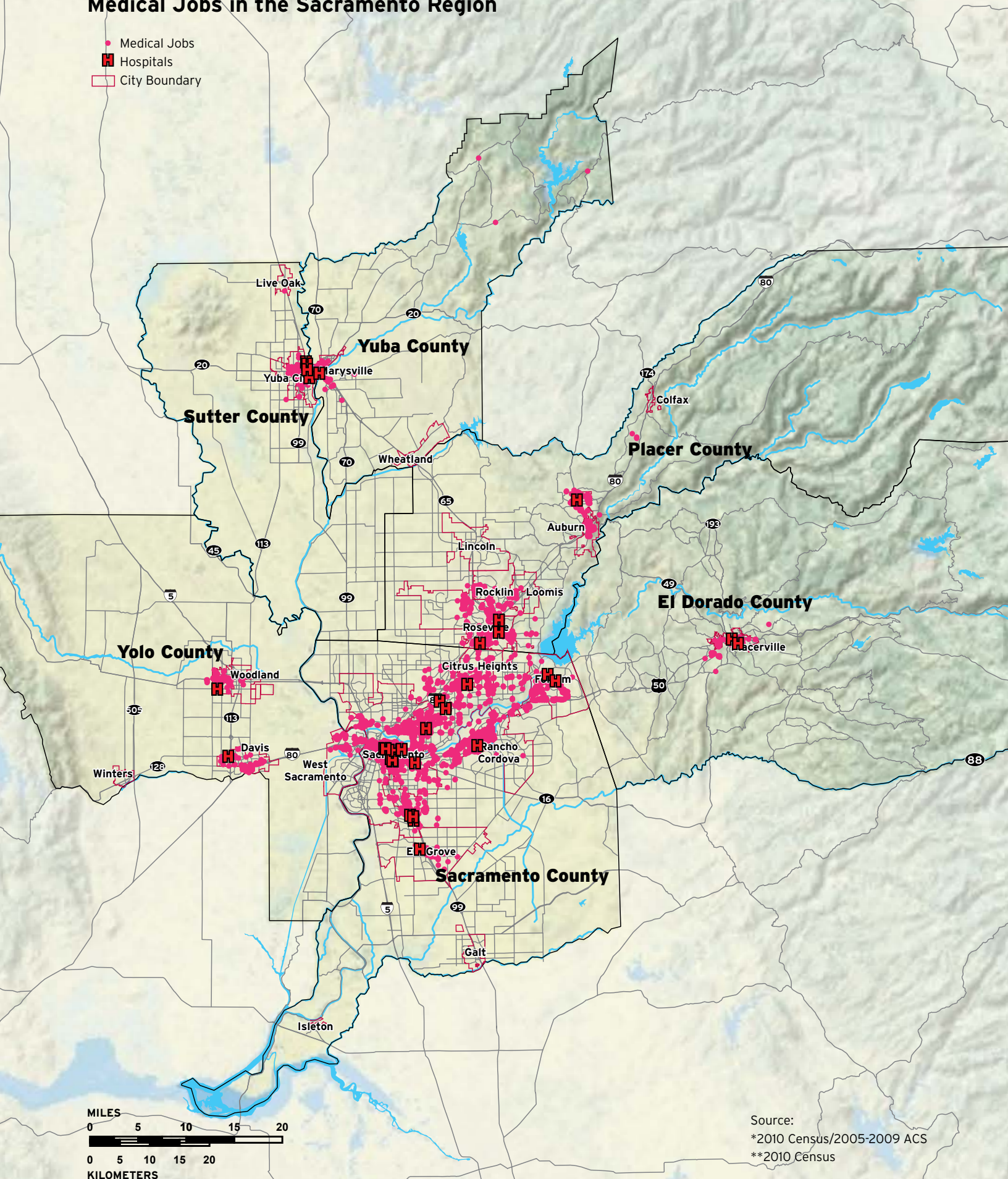
SACOG does recognize limitations with this measure. The measure used in this LIHM analysis is of transit access to medical jobs, rather than to medical services. It is currently not possible to measure or forecast each resident's access to medical services due to the range of providers available, the 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 8.5

# Medical Jobs in the Sacramento Region

- Medical Jobs
- H Hospitals
- City Boundary



Source:  
\*2010 Census/2005-2009 ACS  
\*\*2010 Census



**Access to Higher Education**

Higher education is an important stepping stone to careers and employment for many of the region’s LIHM and Non-LIHM 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 LIHM or Non-LIHM Area can reach via transit. Enrollments are projected to 2036 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 2012 and 2036, the number of enrollments accessible via transit within 30 minutes increases by 44 percent from LIHM Areas, as well as 37 percent from Non-LIHM Areas. These increases are due both to improved transit service, as well as a 36 percent projected growth over the plan period in higher education capacity in the region, particularly in more central areas.

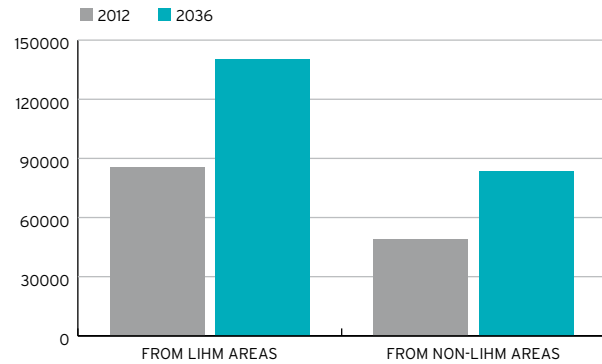
No transit accessibility measure can address which colleges or universities offer the training or degree programs sought by LIHM or Non-LIHM Area residents or whether student applicants will be accepted for admission, but SACOG recognizes limitations even with its current methodology. Assessing transit access to enrollment levels may understate or overstate transit access from LIHM 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

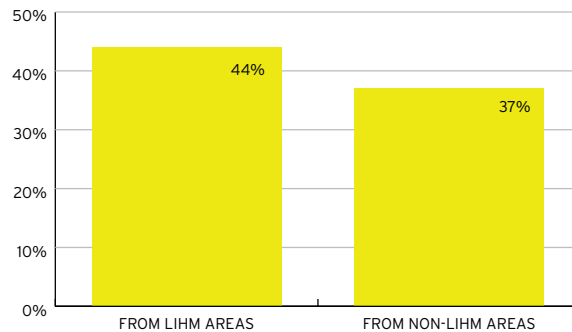
**Transit Access to Higher Education**

Increase in Higher Education Enrollments Accessible within 30-Minute Transit Travel Time

**Transit Access to Higher Education**



**Increase in Higher Education Accessible by Transit**



### Access to Parks

Access to parks is important for youth and adult physical activity, health and recreation opportunities.

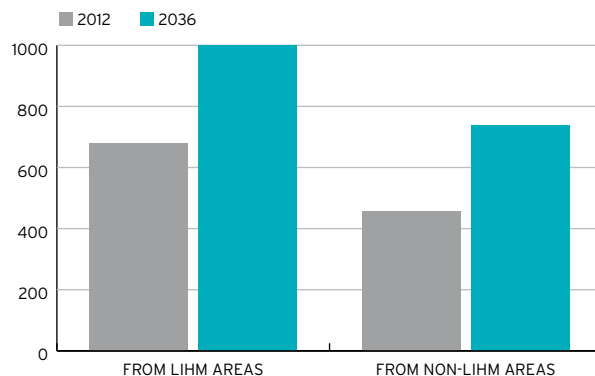
Access to parks in this analysis is defined as access to park acres. Future park acreage is projected through 2036 using a standard park ratio of 5 acres per 1,000 population for areas with new growth. As shown in Figure 8.7, by this measure park acres accessible within 30 minutes by transit increase by 47 percent from LIHM Areas and by 63 percent from Non-LIHM Areas. LIHM Area residents also have transit access to more park acres on average than Non-LIHM Area residents, likely due to the greater availability of transit services in more central areas.

FIGURE 8.7

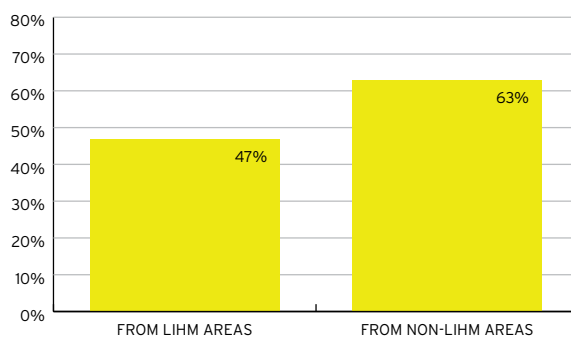
### Transit Access to Parks

Increases in Park Acreage Accessible within 30-Minute Transit Travel Time

#### Transit Access to Park Acres



#### Increase in Park Acres Accessible by Transit



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 LIHM and Non-LIHM Areas can access via transit. SACOG plans to explore new methodologies that can better capture transit access to parks from LIHM and Non-LIHM Areas, taking into account the significant variation in parks across the region, as well as proximity for walk or bike access.

### 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 2012 and 2036. Although transit use remains limited, in most counties transit mode share more than doubles for both LIHM and Non-LIHM Areas.

TABLE 8.7

### LIHM and Non-LIHM Area Transit Mode Share, 2012 & 2036

Area	Percent of All Travel by Transit, 2012	Percent of All Travel by Transit, 2036
LIHM Areas	2.0%	4.9%
Non-LIHM Areas	0.9%	2.1%

SACOG also analyzed the percentage of trips made by transit based on household income. As indicated in Table 8.8, households of all income levels increase the proportion of their trips made by transit as a result of the land use pattern and transit investments in the plan, with those in the lowest income brackets using transit the most.

TABLE 8.8

**Transit Trip Share by Household Income Category, 2012 & 2036**

Household Income Level	Percent of All Travel by Transit, 2012	Percent of All Travel by Transit, 2036
Less than \$15,000	4.4%	9.2%
\$15,000 - \$30,000	1.5%	3.5%
\$30,000 - \$50,000	1.0%	2.4%
\$50,000 - \$75,000	0.7%	1.9%
More than \$75,000	0.6%	1.7%

**Active Transportation**

A new metric for plan performance is the proportion of the LIHM and non-LIHM Area population achieving over 30 minutes of physical activity via their transportation. On most days, nearly half of all adults in California do not meet the recommended level of 30 minutes of moderate physical activity, a widely accepted standard developed by the Centers for Disease Control and Prevention as part of their physical activity guidelines. This lack of physical activity increases risk factors for many chronic diseases and contributes to rising medical care costs. Indeed, work by the California Center for Public Health Advocacy found the economic costs associated with physical inactivity in the six-county Sacramento region to be over \$1.1 billion in 2006. Overall, adults from LIHM income levels and minority groups (except American Indians and Alaskan Natives) are less likely to meet recommended physical activity levels, and thus more likely to incur increased medical care costs. However, the region's transportation system can help support increased physical activity and its associated health benefits, in addition to providing access to jobs, education and other opportunities.

For this active transportation indicator, SACOG assessed the number of people in the region who get at least 30 minutes of physical activity from active modes of transportation, defined as bike trips, walk trips, and the walk component of transit trips (i.e., walking to and from the transit station/stop on either end of the

trip). This assessment was performed using SACOG's regional travel demand model. The measure only looks at physical activity from transportation itself, and does not capture other ways residents may reach the recommended 30-minute threshold, such as going to a gym, participating in organized sports, recreational walking or biking, or doing household chores or yardwork.

The plan anticipates that by 2036 over a quarter of the LIHM Area population will be in Centers and Corridors and about two-thirds of both LIHM and Non-LIHM Area population will live in Established Communities. This active transportation measure shows that these land use patterns combined with plan investments in transit and bicycle/pedestrian infrastructure result in increases in use of active transportation modes and minutes of physical activity that outpace population growth. This increase in active transportation is especially apparent in LIHM areas: by the horizon year of the plan, residents of LIHM areas who meet recommended physical activity levels just by how they commute and travel through the region increase by 79 percent, while the population of these same areas rises by only a third. By 2036, through using active transportation modes, over 14 percent of all people living in LIHM areas surpass the threshold of 30 minutes of physical activity most days, and 8 percent of individuals in non-LIHM areas, as shown in Table 8.9.

TABLE 8.9

**Increases in Individuals with over 30 Minutes of Daily Active Transportation, 2012 & 2036**

	LIHM Areas			Non-LIHM Areas		
	2012	2036	Increase	2012	2036	Increase
Population	692,002	914,893	32%	1,576,136	2,163,879	37%
People with over 30 mins. of active transportation	69,360	124,017	79%	102,713	175,261	71%
% with over 30 mins. of active transportation	10%	14%		7%	8%	

SACOG has also assessed a number of other health-related measures and models with support from the Strategic Growth Council. SACOG is continuing to explore additional potential health metrics for projecting and monitoring public health outcomes in the next plan cycle. Appendix C-6 - Active Transportation/Health Metrics Research details SACOG's work to date.

### Auto Accessibility

As noted earlier, a majority of LIHM Area residents travel by personal vehicle to their destinations, as do a majority of Non-LIHM Area residents. For this reason, this analysis also examines the effect of the MTP/SCS on access by auto from both LIHM and Non-LIHM 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.

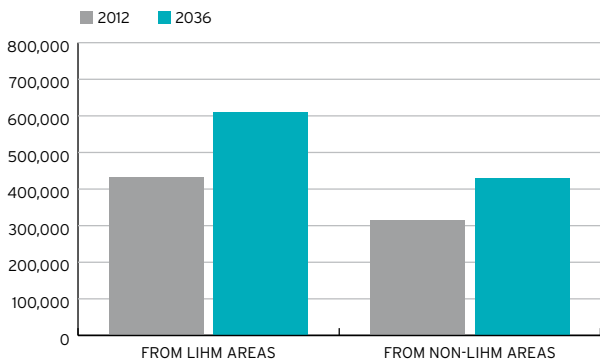
As noted previously, this analysis uses a weighted average for the jobs, higher education enrollments, and park acres that can be accessed by car. Auto travel time is calculated as the time spent driving from home to destination, including time to park.

**Job Access by Car**

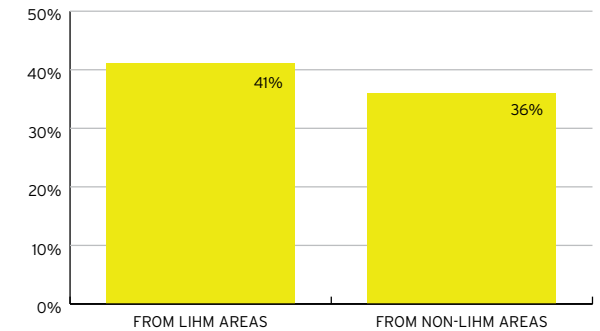
As shown in Figure 8.8, access to jobs within a 30-minute drive increases. Jobs that can be accessed increase by 41 percent from LIHM Areas and 36 percent from Non-LIHM Areas between 2012 and 2036. Auto access also increases to retail jobs, 23 percent from LIHM Areas and 17 percent from Non-LIHM areas, although the total job base is lower.

**FIGURE 8.8**  
**Auto Access to Jobs and Retail Jobs**  
 Increase in Jobs Accessible within 30 Minutes by Car, 2012-2036

**Auto Access to Jobs**



**Increase in Jobs Accessible by Auto**

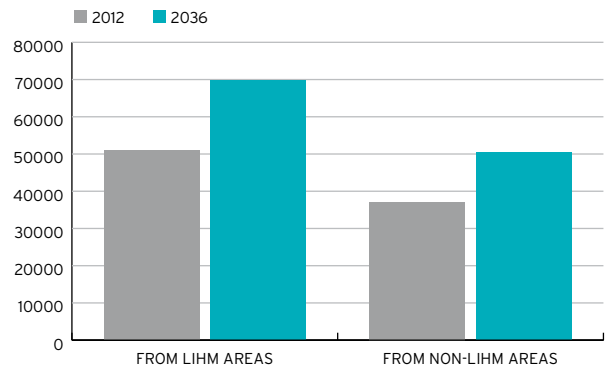


**Access to Medical Jobs**

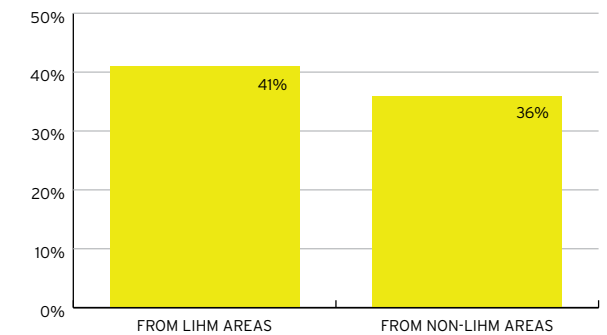
Figure 8.9 illustrates the 36-37 percent increase in medical jobs that can be accessed within a 30-minute drive from both LIHM and Non-LIHM areas across the region. As with the transit access measure, SACOG is using medical jobs as the best currently available proxy for access to medical services.

**FIGURE 8.9**  
**Auto Access to Medical Jobs**  
 Increase in Medical Jobs Accessible within 30 Minutes by Car, 2012-2036

**Auto Access to Medical Jobs**



**Increase in Medical Jobs Accessible by Auto**





### Higher Education Access

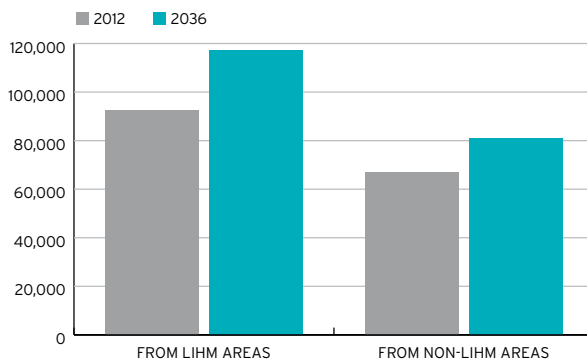
Auto access to higher education also improves by 27 percent for residents of LIHM Areas and 21 percent from Non-LIHM Areas in the region. Figure 8.10 shows these increases in auto access within 30 minutes to higher education enrollments.

FIGURE 8.10

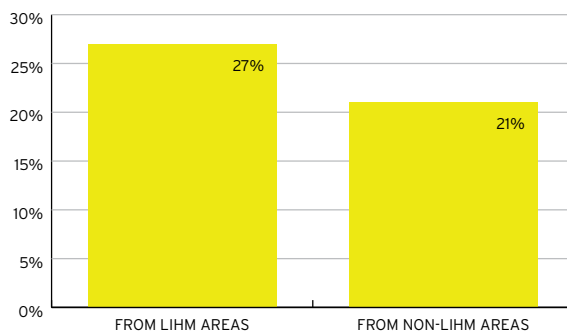
#### Auto Access to Higher Education, 2012-2036

Increase in Higher Education Enrollments Accessible within 30 Minutes by Car

#### Auto Access to Higher Education



#### Increase in Higher Education Accessible by Auto



### Access to Parks

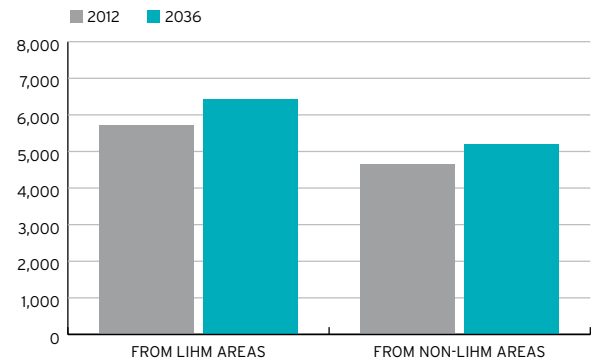
Lastly, SACOG measured the improvement in auto access to parks between 2012 and 2036. By 2036, as shown in Figure 8.11, park acres accessible by car increase by 12 percent from both LIHM Areas and Non-LIHM Areas.

FIGURE 8.11

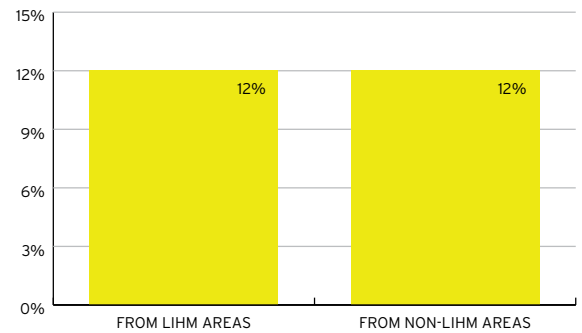
#### Auto Access to Parks, 2012-2036

Increase in Park Acreage Accessible within 30 Minutes by Car

#### Auto Access to Parks



#### Increase in Parks Accessible by Auto



### Transit and Auto Access Comparison

SACOG also conducted a regional analysis comparing transit and driving access within 30 minutes from LIHM and Non-LIHM Areas. Table 8.10 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 LIHM and Non-LIHM Areas within 30 minutes. The table also uses a weighted average for the jobs, higher education enrollments, and park acres that can be accessed by transit or driving.

Table 8.10 indicates that regionally, transit accessibility within 30 minutes to jobs, medical jobs, and higher education is projected to improve for residents of LIHM Areas, but auto accessibility from LIHM and non-LIHM 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 2036 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 2036 from LIHM areas, close to 50 percent of the region's jobs and medical jobs, and over 60 percent of higher education enrollments will be accessible within 30 minutes by car, compared with around 11 percent of jobs and 17 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-LIHM Areas, about a third of the region's jobs and medical jobs and 43 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-LIHM 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 2036 residents of LIHM Areas are expected to have access to about 25 percent of the region's park acres by car but only 4 percent by transit within 30 minutes. Residents of Non-LIHM Areas are projected to have access to 20 percent of the region's park acres by car vs. 3 percent by transit within 30 minutes. As discussed previously, SACOG plans to continue refining these performance measures over time.

TABLE 8.10

### Comparison of Transit and Driving Accessibility within 30 Minutes from LIHM and Non-LIHM Areas

Type of Accessibility	Percent of Regional Total Accessible within 30 Minutes by Transit		Percent of Regional Total Accessible within 30 Minutes by Car	
	from LIHM Area	from Non-LIHM Area	from LIHM Area	from Non-LIHM Area
<b>Jobs</b>				
2012	10%	6%	49%	36%
2036	11%	6%	46%	32%
<b>Medical Jobs</b>				
2012	13%	7%	54%	40%
2036	12%	7%	49%	35%
<b>Higher Education Enrollments</b>				
2012	16%	8%	67%	48%
2036	17%	8%	62%	43%
<b>Park Acres</b>				
2012	3%	2%	25%	21%
2036	4%	3%	25%	20%

### 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.

Table 8.11 shows the percent of the population within and outside this 500-foot buffer in LIHM and Non-LIHM Areas in the region. In both 2012 and 2036, the percentage of total LIHM Area population exceeds the percentage of total Non-LIHM Area population within the buffer zone by about 2:1; however combined, the proportion of both LIHM and Non-LIHM Area population within the buffer zone increase only slightly between 2012 and 2036, from 2.7 to 3.1 percent of the entire region’s population.

TABLE 8.11

### Population within and Outside 500-Foot Buffer of High-Volume Roadways, 2012 & 2036

County	2012 – within 500' Buffer 2.7% of Regional Population		2012 - Outside 500' Buffer 96.3% of Regional Population	
	% of total LIHM Area Population	% of total Non-LIHM Area Population	% of total LIHM Area Population	% of total Non-LIHM Area Population
El Dorado	0.6%	0.7%	99.4%	99.3%
Placer	3.6%	1.8%	96.4%	98.2%
Sacramento	4.5%	2.3%	95.5%	97.7%
Sutter	1.4%	2.1%	98.6%	97.9%
Yolo	5.4%	2.4%	94.6%	97.6%
Yuba	4.0%	0.6%	96.0%	99.4%
<b>Region Total</b>	<b>4.4%</b>	<b>2.0%</b>	<b>95.6%</b>	<b>98.0%</b>

County	2036 – within 500' Buffer 3.1%		2036 – Outside 500' Buffer 96.9%	
	% of total LIHM Area Population	% of total Non-LIHM Area Population	% of total LIHM Area Population	% of total Non-LIHM Area Population
El Dorado	2.8%	0.9%	97.2%	99.1%
Placer	4.3%	1.6%	95.7%	98.4%
Sacramento	5.0%	2.9%	95.0%	97.1%
Sutter	1.7%	1.5%	98.3%	98.5%
Yolo	7.6%	2.2%	92.4%	97.8%
Yuba	4.0%	0.5%	96.0%	99.5%
<b>Region Total</b>	<b>5.1%</b>	<b>2.2%</b>	<b>94.9%</b>	<b>97.8%</b>

The science behind such environmental hazards analysis is continuing to evolve. In 2005, the California Air Resources Board issued its Air Quality and Land Use Handbook: A Community Health Perspective. The Handbook sought to provide guidance concerning potential health impacts associated with proximity to air pollution sources, while stating, “with careful evaluation, infill development, mixed use, higher density, transit-oriented development, and other concepts that benefit regional air quality can be compatible with protecting the health of individuals at the neighborhood level.” In 2009, the California Air Pollution Control Officers Association (CAPCOA), expanding on the ARB Handbook, released a Health Risk Assessments for Proposed Land Use Projects Guidance Document. The CAPCOA Guide outlined recommended procedures to identify when a project should undergo further risk evaluation, how to conduct a health risk assessment, and mitigation measures appropriate for various land use projects.

Building on the ARB and CAPCOA guidance, SMAQMD developed its Recommended Protocol for Evaluating the Location of Sensitive Land Uses Adjacent to Major Roadways. The Protocol was most recently updated in January 2011. 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 also different for children, seniors and those with certain health conditions than for healthy adults. The SMAQMD Protocol recommends incorporating best practices to reduce pollutant exposure for projects contemplated within 500 feet of a freeway or major roadway, and defines when a site-specific health risk assessment is necessary and the methodology for conducting one.

In February 2015, the Office of Environmental Health Hazard Assessment (OEHHA) issued a new Guidance Manual for air districts on evaluating toxic air contaminants. SMAQMD and other air districts will be working to update their own programs to reflect the new Guidance Manual. While none of these guidance documents are regulatory, they do provide information, methodologies, and best practices for land use decision makers to make informed land use decisions on siting new residential projects and other sensitive land uses in

proximity to freeways and major roadways, and to consider public health along with other priorities such as housing and transportation needs, and the benefits of urban infill and community economic development.

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 health risk assessments on a project-by-project basis to assess risk for planned residents or users, and provides guidance and methodologies for conducting such assessments.
- 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 freeways and major 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. Best practices also exist to mitigate risks, such as siting residences and sensitive receptors furthest away from the roadway, reducing windows facing the freeway or major 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 3 percent of the population in SACOG's analysis. In addition, of the small number of residents within the buffer zone in LIHM and Non-LIHM Areas, it is likely that the population is diverse in ethnicity and income level, especially by 2036. Trends will likely continue to geographically decentralize the concentrations of LIHM populations compared to today; the inherent limitations in estimating impacts on LIHM compared with Non-LIHM populations in 2036, together with SACOG's inability to project the location of the new population within these two categories, likely mean that these data over-state the differences between LIHM and Non-LIHM populations for exposure to air contaminants. SACOG still has no way of further quantifying these effects at this time.

Freeway and major roadway exposure as a performance measure is a step towards identifying the effects on LIHM and Non-LIHM 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.

### Roads and Related Improvements

Road projects in the MTP/SCS are located throughout the region and are not disproportionately concentrated in LIHM Areas. Figure 8.12 illustrates the key road projects overlaid on LIHM and non-LIHM Areas. Due to funding shortfalls, the MTP/SCS reduces funds for road capacity investments by 9 percent per capita from the level in the 2012 MTP, while increasing road maintenance/rehabilitation and bicycle/pedestrian funding by 20 and 12 percent, respectively. It is important to note that because a portion of funds are categorical, not all projects that will be funded over the life of the plan can be mapped.

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 encourages member agencies to consider all users in the planning, construction, operation, and maintenance of any transportation projects contained in the plan.

Sample MTP/SCS road projects that benefit LIHM Areas include:

#### City of Citrus Heights

Rehabilitation and complete street improvement of Antelope Road, Auburn Blvd., and Greenback Lane, including ADA, pedestrian, bicycle, and transit facilities.

#### City of Elk Grove

Implementation of Project AWARE (Advancing Walk and Roll Environments) to identify needed roadway improvements to support students walking and biking safely to multiple schools in the city.

#### City of Lincoln

Improvements to Lincoln Boulevard, the city's main street, between First St. and McBean Park Dr. to provide a more pedestrian, bicycle- and Neighborhood Electric Vehicle (NEV)-friendly environment, including wider sidewalks, crosswalks, intersection bulb-outs, and Class 2 bike/NEV lanes.

#### City of Live Oak

Numerous road rehabilitation and streetscape improvement projects to support community redevelopment, including drainage, curb and gutter, sidewalks, and bike lanes.

#### City of Marysville

Planning and infrastructure projects to improve safe bicycle and pedestrian routes to various local schools.



### **City of Sacramento**

- Improvements to Meadowview Rd. from the light rail station to I-5 and along 24th St from Meadowview Rd. to Florin Rd., including medians, sidewalk treatments, and crosswalks.
- Improvements to North 12th Street between Richards Blvd. and North B Street to support the Twin Rivers Choice Neighborhood plan, including sidewalk widening, drainage and safety improvements, and Regional Transit planning for a new Blue Line light rail station at North 12th Street and Richards Blvd.

### **Sacramento County**

Complete street improvements such as sidewalk and intersection improvements and bike lanes on Fulton Avenue from Arden Way to Auburn Blvd., Cottage Way between Cortez Ln. and Watt Ave., and Fair Oaks Blvd. from Marconi to Engle Rd. including along the frontage of Carmichael Park.

### **City of Woodland**

Streetscape improvements on East Main Street, including sidewalks, 10-foot off-street bike path, landscaping, class II bike lanes and bus turnouts.

### **Yuba City**

Replacement of the two-lane 5th Street Bridge across the Feather River with an upgraded four-lane bridge, including pedestrian/bicycle improvements to facilitate travel between Yuba City and Marysville.

### **Yuba County**

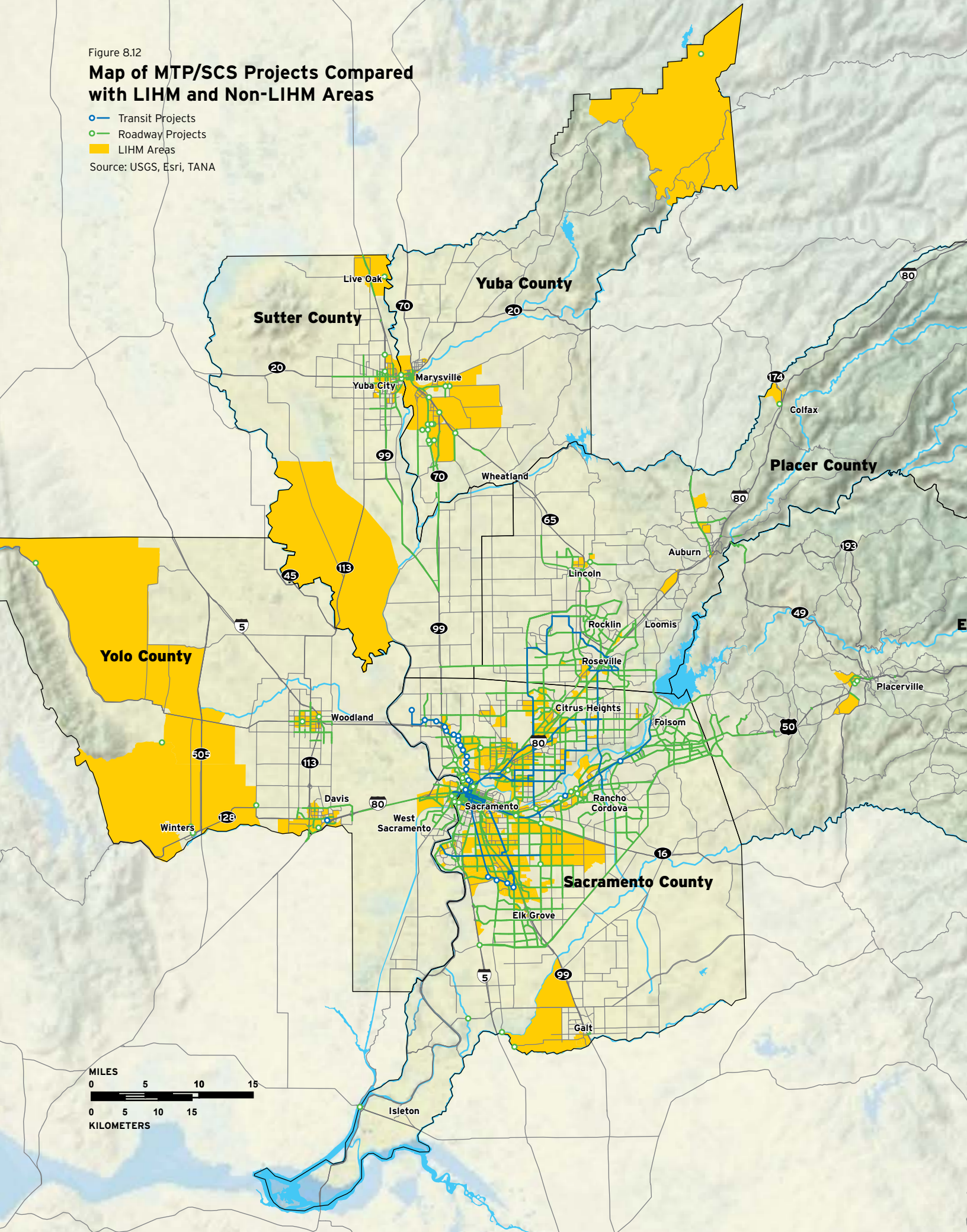
Complete street improvements to North Beale Road in the area of Yuba Community College in Linda, and to Olivehurst Ave. from 7th Ave. to McGowan Pkwy, and a roundabout at the intersection of Olivehurst Ave. and Powerline Rd., with lighting, refuge islands, and widened sidewalks to facilitate pedestrian and bicycle travel.

Figure 8.12

### Map of MTP/SCS Projects Compared with LIHM and Non-LIHM Areas

- Transit Projects
- Roadway Projects
- LIHM Areas

Source: USGS, Esri, TANA



A complete list of projects is in Appendix A-1 - Project List.

As a result of the MTP/SCS land use pattern and roadway, bike and pedestrian facility investments, walking and bicycling are expected to increase as a mode share in the region in both LIHM and Non-LIHM Areas, as shown in Table 8.12.

TABLE 8.12

### **Bike and Walk Mode Share in the SACOG Region, 2012 & 2036**

Area	2012 Bicycle and Walk Mode Share	2036 Bicycle and Walk Mode Share
LIHM Areas	13.2%	15.5%
Non-LIHM Areas	7.5%	8.4%

## Title VI Analysis

While environmental justice is a principle for federal agencies to ensure their programs and activities do not disproportionately burden low-income and minority populations, Title VI provides legal protection from discrimination in federal programs on the basis of race, color, or national origin.

Following the adoption of the 2012 MTP/SCS, the Federal Transit Administration (FTA) issued a new Title VI Circular, Circular 4702.1B, in October 2012. The Circular provides guidance to metropolitan planning organizations (MPOs) such as SACOG and other recipients of federal Department of Transportation (DOT) funding to ensure that their programs, policies, and activities comply with DOT's Title VI regulations. Every three years, SACOG and other MPOs must submit a Title VI Program report providing information and analysis on their compliance with Title VI regarding nondiscriminatory delivery of services and benefits under federally-funded programs or activities. The Circular further states:

In its regional transportation planning capacity, the MPO shall submit to the State as the primary recipient, and also to FTA:

1. All general requirements) set out in section 4 of Chapter III of this Circular;
2. A demographic profile of the metropolitan area that includes identification of the locations of minority populations in the aggregate;
3. A description of the procedures by which the mobility needs of minority populations are identified and considered within the planning process;
4. Demographic maps that overlay the percent minority and non-minority populations as identified by Census or ACS data, at Census tract or block group level, and charts that analyze the impacts of the distribution of State and Federal funds in the aggregate for public transportation purposes, including Federal funds managed by the MPO as a designated recipient;
5. An analysis of impacts identified in paragraph (4) that identifies any disparate impacts on the basis of race, color, or national origin, and, if so, determines whether there is a substantial legitimate justification for the policy that resulted in the disparate impacts, and if there are alternatives that could be employed that would have a less discriminatory impact.

SACOG conducted a Title VI analysis per FTA guidance, and did not identify disparate impacts based on race, color or national origin. Detail on the analysis may be found in Appendix C-5.

## Strategies

Chapter 6: Policies and Strategies, 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 (RUCS), 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.

SACOG is committed to deepening its ability to analyze and address performance considerations in its planning activities. Since the adoption of the 2012 MTP/SCS, SACOG has undertaken a number of efforts designed to help implement the plan and Blueprint vision for the region. These efforts include:

### Technical Assistance

Through funding from the Strategic Growth Council's third grant round, SACOG is working with Portland State University's Urban Sustainability Accelerator (USA) Program to provide technical assistance to cities and counties in the region on specific priority local projects that will help intensify/revitalize a Center, Corridor, or Established Community. SACOG is also beginning a program of technical assistance to cities, counties, developers, public health staff, advisory councils/neighborhood groups, and other stakeholders on addressing older commercial corridors and advancing healthy communities through active design/transportation policies, plans and implementation.

### Community Revitalization and Capacity-Building in Disadvantaged Communities

In a project funded by the Strategic Growth Council, Sierra Health Foundation and The California Endowment, SACOG is working with Portland State University's Center for Public Interest Design, community organizations and residents to investigate and complete feasibility studies for reuse/revitalization efforts in disadvantaged areas of South Sacramento and Del Paso Heights.

### Regional Bicycle, Pedestrian and Trails Master Plan

SACOG updated the regional Master Plan for bicycle, pedestrian and trails improvements in Spring 2015, with help from member jurisdictions and the Bicycle and Pedestrian Advisory Committee. The plan can be found in Appendix H-1 - Regional Bicycle, Pedestrian and Trails Master Plan.

### Safe Routes to School Education and Encouragement Project

With partner organizations, staff has been creating trainings and tools to help sustain new and continuing Safe Routes to School programs in the region.

### Regional Bike/Ped Data Collection

SACOG is developing a pilot bicycle/pedestrian counter data collection program to help inform bicycle infrastructure planning, and bicycle/pedestrian project evaluation standards to help guide future regional funding rounds.

### Bikeshare Pilot Project

SACOG is leading an effort to plan, install and operate a pilot system of bikeshare stations serving the cities of Sacramento, West Sacramento, and Davis, including addressing access for residents of disadvantaged communities.

### **Connectivity Study of Transportation Services to Improve Health Care Access**

Funded through a Caltrans discretionary planning grant, this regional study implements a recommendation of SACOG's Lifeline Transit Study to identify and analyze needs and alternatives to improve transportation access to health and mental health care.

### **Rural Ride-Sharing Alternatives Planning Study**

Through a Caltrans grant, SACOG staff will lead a planning study of ridesharing alternatives to serve seniors, persons with disabilities and low-income families living in very rural portions of the region where public transit is costly, limited or non-existent.

### **Housing Element Assistance**

As part of HUD-grant funded work to explore housing programs and requirements across the region, SACOG staff developed regional data sets to support member jurisdictions' work on required updates of their housing elements.

### **Access to Local Food**

Through the RUCS project, described in more detail in Chapter 7: Environmental Sustainability and Appendix E-2 - Rural-Urban Connections Strategy, SACOG is continuing to conduct studies and analyses to support rural and urban agricultural production and greater access to local, healthy food in the region.

Specific areas where SACOG hopes to build future analytical capacity and expertise for MTP/SCS and planning efforts include:

- Jobs-Housing Fit and Housing plus Transportation Cost measures. SACOG is continuing its efforts to develop consistent, data-supported methodologies that help 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 older adults, as the region ages.
- Measures of benefits to youth as the future residents of the region.

SACOG is also continuing to explore combined and individual indicators that would broaden SACOG's biannual monitoring report and help deepen the region's understanding of progress made in implementing the MTP/SCS and Blueprint vision.



## CHAPTER 9

# Economic Vitality

Efficiently connect people to their communities and get goods to market

## Regional Employment Patterns

Jobs and employment are the drivers of growth in the region. Jobs, or the prospect of jobs, bring new residents to the region, and generate wages and income for households and a large share of the region's travel demand. Approximately 20 percent of the person trips, and almost half of the vehicle miles traveled by residents of the region, are related to commuting to work. The vast majority of commercial and truck trips have one or both ends at an employment site in the region.

Integrated land use and transportation planning support the region's economic vitality in several fundamental ways, including 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 transportation support for commerce and employment generally in the region.

As discussed in Chapter 3, SACOG developed regional growth projections for this plan update that are largely informed by and consistent with projections used in the 2012 MTP/SCS that were developed by the Center for Continuing Study of the California Economy (CCSCE). These technical inputs to the plan include forecasts of future employment (by major employment sector), population, and household growth at the regional scale. Appendix D – Regional Growth Forecast provides more detail.

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. Prior to the Great Recession (2007-2009), the SACOG region was experiencing job growth above the state average. However, due to the national recession, regional employment dropped precipitously after peaking in 2007.

Although the region is still recovering from the recession, today much of the employment lost between 2008 and 2012 is back, and the region is again outpacing the

state in terms of job growth. In 2008, the region had over 966,000 jobs, but by 2012, jobs had decreased region-wide to about 900,000. By 2014, job totals had returned to nearly 936,000, as shown in Table 9.1. Job growth led to the unemployment rate for the six-county region dipping below 10 percent early in 2013, for the first time since late 2008. The unemployment rate, though, still shows significant variation within the region. It is lowest in Placer County at about 6.3 percent in 2014, compared to the peak of 11.6 percent in 2010. The unemployment rate in 2014 was highest in Yuba and Sutter Counties at 11.2 and 12.7 percent, respectively, but has decreased significantly compared to 17.8 and 18.4 percent in 2010.

### 2020 and 2036 Job Projections

In its regional projections for the 2012 MTP/SCS, CCSCE identified numerous factors that were expected to restrain job growth in the SACOG region to 2020. SACOG's employment projections for this MTP/SCS also identify the following factors as affecting near-term job growth by 2020:

- Slower national and state growth rates, in part due to reduced immigration rates in the short-term.
- Slower recovery expected in the housing market – although lower home prices make the area more attractive to potential businesses and residents.
- State budget challenges that might 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.<sup>1</sup>

However, as noted above, the region is showing signs of increasing job recovery. According to the U.S. Census Bureau, among the 50 largest counties with the most employees, Sacramento had the highest rate of employment growth among all sectors between 2012 and 2013 (up 5.5 percent). Because the region is making positive progress towards reversing the significant job loss that occurred from 2008 to 2012, and appears to

<sup>1</sup> CCSCE, 2012 MTP/SCS, Appendix D-1 Regional Projections.

be on course to fulfill many of the long-term economic projections made by CCSCE for the 2012 MTP/SCS, the total number of jobs forecast in the region by 2036 is virtually the same in this plan update as for the 2012 MTP/SCS.

Table 9.1 shows the comparison of employment projections for the 2012 MTP/SCS and this plan. While early-year employment projections were greater in the 2012 plan than in this plan update, projections by 2027 are close, and by 2036 employment projections are virtually identical. Appendix D-1 has more detailed information and background on these regional growth projections.

TABLE 9.1

### Comparison of Employment Projections for 2012 and 2016 MTP/SCS<sup>2</sup>

Year	Total Employees		
	2012 MTP/SCS	2016 MTP/SCS	Lag of 2016 vs. 2012 SCS
2012	1,001,700	900,196	-101,504
2014	1,019,892	935,743	-84,149
2020	1,072,544	1,042,385	-30,159
2027	1,192,698	1,178,434	-14,264
2036	1,327,423	1,326,851	-572

Table 9.2 shows which major industry sectors are projected to grow more quickly or slowly through 2020 and through 2036.

TABLE 9.2

### Projected Percentage Growth in Jobs by Major Industry Group through 2020 and 2036 (from 2012)

Industry	2012-2020	2012-2036
Agriculture, Mining, Utility, Construction, Manufacturing, Wholesale, Transportation/Warehousing	8%	24%
Finance, Insurance, Real Estate, Professional and Technical Services, Management, Health Care	17%	51%
Public Administration (not including national security or public services such as police, fire, etc.)	15%	45%
Retail Trade	8%	25%
Arts/Entertainment, Recreation, Other Services	11%	33%
Restaurants and Bars	10%	31%
Public and Private Schools	23%	70%
Military	0%	0%
Hospitals and Major Medical Centers	34%	102%
<b>Total Jobs</b>	<b>16%</b>	<b>47%</b>

Although total employment is rising in the region, just as growth varies by geography, the region's employment decreases and increases, varying strongly by sector:

Government sector jobs will be a source of growth, particularly after 2020. 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 continue growing in the future.

Construction saw some of the biggest increases and decreases in the 2000s, adding more than 15,000 jobs between 2001 and 2007, then losing 31,000 between 2007 and 2011. Although construction job levels will still likely grow more slowly in the short term, they are expected to rise in response to long-term population and housing growth.

Manufacturing declined fairly steadily, losing almost 12,000 jobs between 2001 and 2007, and another 8,000 from 2007 to 2011. Retail increased by just over 11,000 jobs during the years 2001 to 2007, and decreased by nearly 12,000 from 2007 to 2011. Factoring in population growth over the same time period, the “rate” of retail employment compared to population or housing declined over the entire period.<sup>2</sup> As shown in Table 9.2, manufacturing and retail trades are projected to grow substantially more slowly than the regional total.

Educational and health services are projected to grow substantially more quickly than total jobs. Health care increased in the 2000s, adding 24,000 jobs from 2001 to 2007, and another 5,000 from 2007 to 2011. The 2036 employment projection assumes that the region will significantly expand health care services 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 continuing to look 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.

Table 9.3 shows the percentage of total jobs in the region by major industry group for 2012, 2020 and 2036. While most of the industry groups remain fairly consistent over time, the significant growth expected in health care-related jobs increases the proportion of total jobs captured by that industry.

TABLE 9.3

### Percent of Total Jobs in the SACOG Region by Major Industry Group, 2012-2036

Industry	2012	2020	2036
Agriculture, Mining, Utility, Construction, Manufacturing, Wholesale, Transportation/Warehousing	14%	13%	12%
Finance, Insurance, Real Estate, Professional and Technical Services, Management, Health Care	20%	20%	20%
Public Administration (not including national security or public services such as police, fire, etc.)	11%	11%	11%
Retail Trade	14%	13%	12%
Arts/Entertainment, Recreation, Other Services	10%	9%	9%
Restaurants and Bars	8%	8%	7%
Public and Private Schools	10%	10%	11%
Military	1%	1%	0.5%
Hospitals and Major Medical Centers	13%	15%	17%
<b>Total Jobs</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

2 SACOG Draft Regional Transportation Monitoring Report, August 2013.

## 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 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 2011 led to over 39.1 million hours of travel delay and \$834 million in congestion costs (calculated as the costs of delay, fuel and truck congestion).<sup>3</sup> For individuals, significant congestion leads to longer commutes and higher household transportation costs.

While the Sacramento region saw reductions in commuting and congestion due to the economic downturn and higher unemployment levels, congestion has persisted in affecting commuters on many of the region's highways and roadways, and is expected to remain an issue as the economy continues to recover 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 crashes, stalled vehicles, spilled loads, roadside distractions, police stops, work zones, and weather. In general, congestion data and analysis is focused on recurring patterns, not one-time incidents or seasonality.

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, orchards, pumpkin patches, Christmas tree farms, and agricultural fairs and festivals), 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. Caltrans and a number of jurisdictions in the region have been working with SACOG on mitigation fee programs for new development, but these fees will primarily serve to address impacts to the state highway system.

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 sections provide a more detailed discussion of these challenges.

3 <http://tti.tamu.edu/documents/mobility-report-2012-wappx.pdf>, p. 29

### Commute Volume, Distance, and Mode Choice

As noted in Chapter 5, commute travel represents a significant share of total travel in the region. Forty-six percent of all household-generated VMT will be commute related by 2036. 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 12.9 miles. Only 5 percent of commute trips in the region are 38 miles or longer. Ninety percent are shorter than 28.7 miles, and 75 percent are shorter than 17 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.

During peak hours, about 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 9.4 illustrates the region's current commute mode shares.

Transit, bicycle and pedestrian commuting have been increasing over time. 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 9.4

### Weekday Commuter Travel Mode, 2012

Mode of Travel	2012
Drive alone	76.3%
Carpool	15.0%
Public Transit	2.5%
Bike/Walk	3.0%
Work at home	3.2%

### 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 84 percent of projected new employment and 58 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 16 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, the West Sacramento-Sacramento streetcar corridor, 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. The large employment centers of Rancho Cordova and southwest Placer County are also slated for significant housing growth that can help bring residents and jobs closer together.

Although the MTP/SCS projects some long-distance commuting will continue to downtown Sacramento, Rancho Cordova, southwest Placer County and other major job centers, the per capita decline in vehicle miles traveled reflects improvement from today and the 2012 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.

### Jobs/Housing Relationship

The relationship between the number of households and jobs has long been used as an indicator of the potential for longer or shorter commutes. The most common statement of the relationship is the "jobs/housing balance" (J/HB). In areas with very low J/HB (i.e., few jobs for the number of households in the area), many workers need to commute out of their residence area to find work. In areas with very high J/HB (i.e., many jobs for the number of households in the area), jobs need to be filled by workers from outside the area. All else being equal, areas with high or low J/HB's are likely to generate longer commutes for workers. This is the most basic assumed relationship of the balance between J/HB and the need for travel.

Table 9.5 provides a county-level tally of the land use forecast for jobs and households. A base year of 2008 is being shown for this summary because it reflects a more normal year in the regional economy than 2012 as that was during the recession. At a county level, J/HB improves for El Dorado County, and is stable for other counties. However, as discussed in the following sections, county-level assessments of J/HB may miss significant issues based on the distributions of jobs, households and worker flows related to the region's major job centers.

TABLE 9.5

### Jobs and Households by County, 2008 and 2036

County	Jobs		Households		Jobs/Housing Balance	
	2008	2036	2008	2036	2008	2036
El Dorado <sup>1</sup>	44,763	64,078	55,305	70,071	0.81	0.91
Placer <sup>1</sup>	141,613	210,034	124,761	188,106	1.14	1.12
Sacramento	626,155	831,171	511,402	699,811	1.22	1.19
Sutter	31,751	43,805	31,314	43,462	1.01	1.01
Yolo	102,378	145,690	73,013	105,828	1.4	1.38
Yuba	23,178	32,501	23,482	32,924	0.99	0.99
<b>Regional Total</b>	<b>969,838</b>	<b>1,327,279</b>	<b>819,277</b>	<b>1,140,202</b>	<b>1.18</b>	<b>1.16</b>

<sup>1</sup> Excludes Tahoe Basin.

### Regional Job Centers

For purposes of evaluating land uses for the 2016 MTP/SCS, jobs/housing balance was assessed for the region's 15 largest employment centers. A base year of 2008 was used for this particular analysis because it reflected a more normal year in the regional economy than 2012 during the recession.

For this analysis, job centers are defined as:

- Concentrations of at least 10,000 "base" jobs (i.e. including manufacturing, office, medical, educational, and service employment, and excluding "residential-serving" sectors like retail and restaurant uses), at average density of eight or more jobs per acre. "Base" jobs were considered in defining the centers, because these jobs are more directly related to economic vitality and competitiveness in the region.
- Centers where 80 percent or more of the uses within the center were employment, not residential. Little housing was provided within the center, and J/HB must be achieved in areas around the centers.

Figure 9.1 shows the geography of the 15 employment centers meeting the above criteria. The map shows the underlying 2036 base employment density on which the jobs center definition was based.

Table 9.6 shows "base" and total jobs and households in 2008 and projected for 2036 in each of the 15 identified job centers. While about 50 percent of base jobs, and 46 percent of total jobs, are located within the 15 jobs centers, only 9 percent of households in 2008, and 12 percent in 2036, were located within the centers. J/HB at the 15 centers ranges from 3.3 to 33.5 in 2008, all well above the regional balance of 1.16. In total, J/HB for all 15 centers is 6.10 in 2008, improving to 4.39 by 2036, but still extremely jobs rich.

Figure 9.1

### Major Employment Centers

- Employment Center
- 4 Mile Buffer
- County Boundaries
- Rivers/Lakes

**Employment Density (non-retail jobs/acre)**  
Low Med High

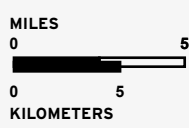
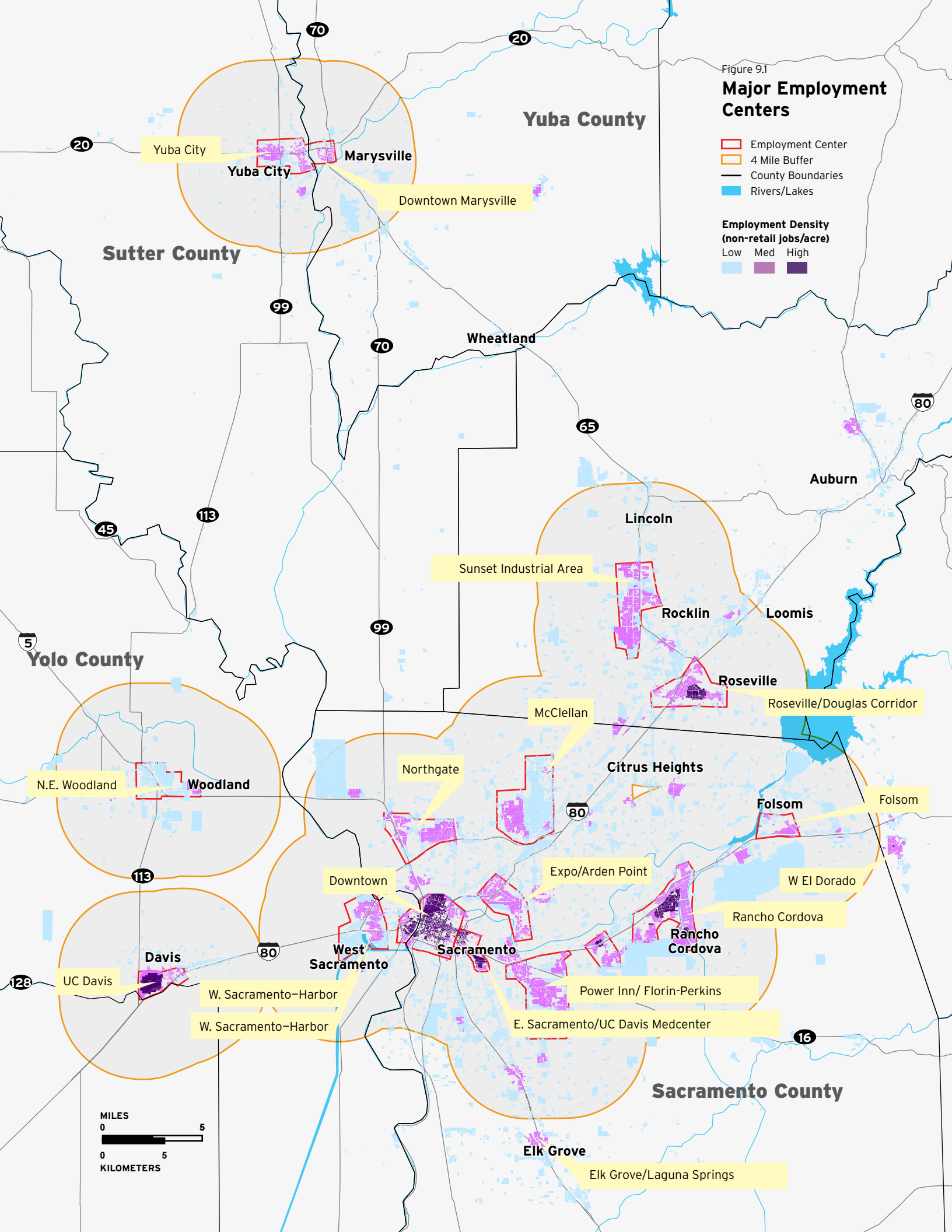


TABLE 9.6  
**Jobs and Households in Employment Centers**

Employment Center	"Base" Jobs <sup>1</sup>		Total Jobs		Households		Jobs/Housing Ratio	
	2008	2036	2008	2036	2008	2036	2008	2036
Sacramento CBD/ Riverfront	99,243	133,026	109,719	144,559	17,523	46,211	6.26	3.13
Rancho Cordova	42,836	61,031	47,764	67,300	6,646	8,572	7.19	7.85
Power Inn/Florin-Perkins	31,928	47,268	34,919	53,409	4,241	14,970	8.23	3.57
Roseville/Douglas Corridor	26,877	32,958	35,202	41,593	6,376	7,764	5.52	5.36
Expo/Arden/PointWest	26,005	25,151	27,786	26,487	4,063	5,207	6.84	5.09
East Sacramento Medical	26,599	23,559	35,318	32,844	7,492	9,322	4.71	3.52
Sunset Industrial Area	17,398	23,991	23,834	30,599	6,122	7,845	3.89	3.9
Yuba City/Marysville/ SR20 Corridor	14,089	38,422	16,135	42,159	482	2,607	33.48	16.17
North Natomas	13,773	24,641	18,667	33,831	4,889	10,195	3.82	3.32
Folsom	20,894	21,753	23,867	25,048	1,650	2,754	14.46	9.1
UC Davis	16,794	29,271	18,987	31,388	5,784	8,635	3.28	3.63
Bradshaw/US-50	10,606	13,707	11,694	15,286	2,411	4,212	4.85	3.63
West Sacramento Industrial Area	11,961	11,682	13,929	13,932	2,016	2,474	6.91	5.63
Woodland NE Industrial Area	11,870	12,061	13,634	14,594	1,656	2,516	8.23	5.8
McClellan	11,931	31,439	13,757	34,998	1,690	5,229	8.14	6.69
<b>Total of All Employment Centers</b>	<b>382,804</b>	<b>529,960</b>	<b>445,212</b>	<b>608,027</b>	<b>73,041</b>	<b>138,513</b>	<b>6.1</b>	<b>4.39</b>
<b>Total in Centers + four- mile Radius</b>	<b>668,478</b>	<b>909,058</b>	<b>822,953</b>	<b>1,113,046</b>	<b>627,682</b>	<b>882,270</b>	<b>1.31</b>	<b>1.26</b>
<b>Total In Region</b>	<b>779,955</b>	<b>1,063,064</b>	<b>969,838</b>	<b>1,327,278</b>	<b>819,277</b>	<b>1,140,202</b>	<b>1.18</b>	<b>1.16</b>
% of Region in Centers	49%	50%	46%	46%	9%	12%		
% of Region w/in 4 miles of All Centers	86%	86%	85%	84%	77%	77%		

1 "Base" jobs exclude retail and food service.

### Employment Center Jobs/Housing Balance

The reality of the relationship between jobs and housing is far more complex than the county-level J/HB in Table 9.5 portrays, for several reasons:

- J/HB is dependent on the geography used for the computation—but there is no “right” geography to use. Example: One jurisdiction has a housing-rich J/HB (say 10,000 households and 3,000 jobs, or a J/HB of 0.3). An adjacent jurisdiction has a jobs-rich J/HB (13,000 jobs and 2,000 households, or a J/HB of 6.5). But both jurisdictions combined (say, at a very small county level), with a total of 16,000 jobs and 12,000 households, has a “good” J/HB of 1.3. Which geography is worth paying attention?
- Areas with “good” J/HB may still force longer commutes for workers, if the housing available in the area is unaffordable or unattractive to the workers filling the jobs in the area. For example, if most of the housing units sufficient to theoretically house all of the area jobs’ employees are market-rate, but most of the jobs in a given area pay minimum wage, does the area still have a “good” J/HB?
- Finally, employment necessarily concentrates in specific areas. For example, industrial/warehouse areas are usually homogenous employment areas with little or no housing for good reason—they are unattractive areas in which to reside. Even for concentrated office and service employment centers, where attractive housing could be located, employment uses often out-compete housing as a land use in those centers, for economic reasons. So, for good planning and economic reasons, healthy, vibrant employment centers tend to have “poor” (and usually jobs-rich) J/HB’s.

These issues, among others, have stimulated a reappraisal of J/HB as a worthwhile indicator of the relationship between jobs and housing, and a move toward the notion of “fit” between wages of jobs (where people work) and costs of housing (where workers reside). Since the 2012 MTP/SCS, SACOG has been seeking to develop a more sophisticated jobs-housing relationship measure, but due to significant data limitations and methodological concerns, will continue to use J/HB as the metric for this MTP/SCS update. The measure is based on the following principles and guidelines:

- It uses as a target average regional J/HB. In 2008, the regional J/HB was about 1.18, or 1.18 jobs per household. This ratio dropped to 1.06 by 2012, due to the loss of employment in the recession. Because 2008 was a more normal year in the regional economy and, based on regional forecasts, the region is expected to return to just under the 2008 ratio of jobs to households by 2036, 1.16 is the target for evaluating J/HB. That is, the degree to which an area moves toward 1.16 is considered improvement in J/HB in the plan. So, a jobs-rich area with 1.9 jobs per household would improve by adding more housing than jobs and thereby moving J/HB toward 1.16. A housing-rich area with 0.5 jobs per household would also improve, by adding more jobs than housing and increasing J/HB toward 1.16.
- The metric assumes that employment in a healthy regional economy has and will continue to cluster in centers, within which “good” J/HB is difficult, and in some cases undesirable, to achieve. J/HB targets must be set not necessarily solely within job centers, but for employment centers and a reasonable area around those centers. The measure uses an objective definition of employment centers, based on the size, concentration, and future capacity of jobs centers within the region, to identify employment areas of interest for assessing and measuring the balance between jobs and potential locations of residences for workers in and around those centers.
- As in the 2012 MTP/SCS, the analysis defines four miles of employment centers as J/HB areas of interest for measuring the fit between jobs and worker residence. The median one-way commute distance for workers in the Sacramento region is about eight miles. Four miles is significantly lower than the median commute distance, and improving the balance between jobs and housing within this distance should support shortening of commute driving distances. Four miles is a reasonable bicycle commute distance, and could also be served with local transit service.
- Jobs outside the centers, but within the combined four-mile radius area, are also considered relevant



for assessing J/HB. Table 9.6 provides a tally of jobs and households within the employment centers themselves and within a four-mile radius. In 2008, about 46 percent of all jobs in the region were located within the 15 employment centers. A very small share (9 to 12 percent) of the region's households are also located within the employment centers as of 2008. However, within the combined four-mile radius around all employment centers, approximately 85 percent of all jobs and 77 percent of all households are located in the combined four-mile radius around all centers as of 2008. This supports the concept of the four-mile "sheds" around these centers assessing progress toward J/HB.

- Because the four-mile radii of some employment centers overlap, SACOG developed an approach that essentially "splits" both jobs and households, and credits each center with the split. So, if a particular area is "shared" by the four-mile radii of two employment centers, each center is credited with one-half of each job and one-half of each household in the overlapping area. This approach recognizes, in a simple way, that "competition" among centers exists for both jobs (on the household side) and workers (on the employer side). This approach also eliminates double counting of jobs and households.

Table 9.7 below provides the "split" calculation of J/HB for each of the 15 employment centers. This method of computing employment center J/HB results in some interesting findings:

- In Year 2008, more centers, plus the "shares" of households and jobs in the four-mile buffer areas, are jobs-rich than housing-rich. Seven centers (Sacramento CBD/Riverfront, Rancho Cordova, Expo/Arden/Point West, East Sacramento Medical, North Natomas, Bradshaw/US-50, and West Sacramento Industrial Area) show up as significantly jobs-rich. Only two centers (Roseville/Douglas Corridor, McClellan) show up as significantly housing-rich.
- To achieve "perfect" J/HB of 1.2, 51,000 more households would need to be located within the combined four-mile radius area.

- Based on the 2036 growth projections for the MTP/SCS, 14 of 15 centers improve in J/HB (i.e., they move closer to 1.16 over the plan horizon). The one center that does not improve, Power Inn Industrial Area, becomes marginally more housing rich, due to the number of new households in the inner Jackson Highway Corridor area.

Overall in the combined four-mile radius area, J/HB improves through the planning horizon, decreasing from 1.31 to 1.26 (i.e., becoming more balanced in total). In comparison, the rest of the region increases from only 0.77 to 0.83 jobs per household.

TABLE 9.7

**Jobs and Households Split to Four-Mile Sheds around Employment Centers**

Employment Center	Total Jobs <sup>1</sup>		Total Households <sup>1</sup>		Jobs/Housing Balance	
	2008	2036	2008	2036	2008	2036
Sacramento CBD/Riverfront	72,043	86,612	38,548	56,434	1.87	1.53
Rancho Cordova	66,532	91,866	47,310	75,308	1.41	1.22
Power Inn/Florin-Perkins	79,966	99,489	77,482	101,061	1.03	0.98
Roseville/Douglas Corridor	62,141	84,640	71,084	80,888	0.87	1.05
Expo/Arden/PointWest	68,775	79,625	35,965	52,594	1.91	1.51
East Sacramento Medical	73,732	90,077	36,697	52,447	2.01	1.72
Sunset Industrial Area	40,445	53,604	37,450	49,080	1.08	1.09
Yuba City/Marysville/SR20 Corridor	53,439	98,957	49,351	88,251	1.08	1.12
North Natomas	45,075	73,306	27,387	44,853	1.65	1.63
Folsom	43,367	57,482	22,227	34,227	1.95	1.68
UC Davis	34,342	44,954	31,193	39,644	1.1	1.13
Bradshaw/US-50	44,041	60,536	22,362	31,736	1.97	1.91
West Sacramento Industrial Area	47,615	69,568	36,576	55,820	1.3	1.25
Woodland NE Industrial Area	27,541	34,399	18,722	23,733	1.47	1.45
McClellan	63,898	87,931	75,328	96,193	0.85	0.91
Total in Centers+four-mile Radius	822,953	1,113,046	627,682	882,270	1.31	1.26
Rest of Region	146,885	214,232	191,595	257,932	0.77	0.83
<b>Region Total</b>	<b>969,838</b>	<b>1,327,278</b>	<b>819,277</b>	<b>1,140,202</b>	<b>1.18</b>	<b>1.16</b>

<sup>1</sup> Jobs and households on this table are split amongst four-mile radius sheds around employment centers, where the sheds overlap.

TABLE 9.8

**Worker Travel Characteristics to Employment Centers**

Employment Center	Worker Travel Characteristics							
	Total Jobs		Total Households		Jobs / Housing Balance		Auto Commute Time (One-Way, in Minutes)	
	2008	2036	2008	2036	2008	2036	2008	2036
Sacramento CBD/ Riverfront	1.87	1.53	17.3	11.5	20.30%	47.60%	31.6	28.3
Rancho Cordova	1.41	1.22	23.8	20.6	2.60%	5.60%	28.3	26.2
Power Inn/Florin-Perkins	1.03	0.98	21.6	19	2.70%	5.40%	25.1	23.3
Roseville/Douglas Corridor	0.87	1.05	19.7	18.4	2.60%	4.80%	21.9	22.3
Expo/Arden/PointWest	1.91	1.51	19.2	17.2	10.90%	13.70%	25.3	24.1
East Sacramento Medical	2.01	1.72	20.1	18.5	4.80%	9.00%	23.5	23.3
Sunset Industrial Area	1.08	1.09	10.1	9	7.40%	9.50%	13.7	12.3
Yuba City/Marysville/ SR20 Corridor	1.08	1.12	23.4	20.4	1.00%	2.30%	24.1	22.5
North Natomas	1.65	1.63	22.7	21.2	2.20%	6.80%	23.8	23.4
Folsom	1.95	1.68	26.4	23.9	1.70%	4.20%	27.2	25.9
UC Davis	1.1	1.13	15	12.4	20.00%	29.30%	33.5	35.4
Bradshaw/US-50	1.97	1.91	20.7	18.5	4.40%	9.70%	24.1	23.4
West Sacramento Industrial Area	1.3	1.25	21	19	2.10%	4.20%	25.8	23.3
Woodland NE Industrial Area	1.47	1.45	27.7	24.3	3.40%	5.60%	27.3	25.4
McClellan	0.85	0.91	23.5	20.6	2.00%	3.20%	25.1	24.8
Total in Centers+four-mile Radius	1.31	1.26	20.2	17.1	8.20%	17.10%	26.5	24.9
Rest of Region	0.77	0.83	21.5	19.5	3.40%	5.20%	26.6	25.4
<b>Region Total</b>	<b>1.18</b>	<b>1.16</b>	<b>20.9</b>	<b>18.4</b>	<b>5.60%</b>	<b>10.80%</b>	<b>26.5</b>	<b>25.1</b>

Based on travel forecasts prepared using SACSIM regional travel demand model, and the Preferred Scenario for Year 2036.

### Travel Performance to Employment Centers

Table 9.8 provides a snapshot of selected worker-travel characteristics to each of the 15 employment centers. As shown in the table:

- Average commute vehicle miles traveled (VMT) per worker at each employment center decreases from 2008 to 2036, from 20.2 to 17.1 for all employment centers.
- Transit, bike and walk mode share increases over time for all of the centers.
- Average auto commute time to each center (calculated averaging both solo vehicle and car-pool times for all auto trips to each workplace) improves to 13 of 15 of the centers.

### Transit-Oriented Development

As discussed in Chapter 3, a portion of the MTP/SCS housing and employment growth is within Transit Priority Areas (TPAs), 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 plan.

Since the 2012 MTP/SCS, SACOG has been working with a variety of partners to identify strategies for jump-starting transit-oriented development (TOD) in the region, along with other MTP/SCS land use and transportation changes, that should help areas grow into more lively commercial and residential hubs, and 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.
- Creating greater social and economic opportunity by facilitating travel to employment, and education and training to increase 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.
- Linking residents and businesses to vital commercial and recreational resources that support social well-being, and improving quality of life, a major factor in business location decisions.

The Metropolitan Research Center at the University of Utah has identified a number of employment sectors that are potential targets for siting near light rail in medium-sized markets such as the Sacramento region, including knowledge-based industries, education, medical care, social services, public administration, and sports stadiums with diverse surrounding uses. SACOG is continuing to support research and partnerships to help address barriers and facilitate supportive TOD in the region's Transit Priority Areas.

### Development in Mature Suburbs

As discussed in Chapter 3, the MTP/SCS projects by 2036 that 30 percent of new housing and 35 percent of new employees will be located in Center and Corridor Communities. The plan also projects that 27 percent of new housing and 49 percent of new jobs will be in Established Communities, which include a number of the region's employment centers, including McClellan Park, Sunset Industrial Park, Woodland Industrial Park, and El Dorado Business Park.

A number of the Sacramento region's Established Communities are suburbs alternately titled "first tier," "inner ring," or "mature," reflecting their growth out from central cities in the wave of suburban development following World War II. Nationwide there are approximately 1,700 first tier suburbs. Using a measure of population declines of five percent or more and increases in poverty of 20 percent or more, the U.S.

Department of Housing and Community Development has defined nearly half of these suburbs as vulnerable or distressed.<sup>4</sup>

The National League of Cities has convened a First Tier Suburbs Council of cities and towns that lie outside of central cities but inside the ring of developing suburbs and rural areas. The Council has identified a variety of challenges facing many first tier suburbs, including renovating aging homes and deteriorating housing stock; maintaining and improving aging infrastructure; addressing deteriorating public schools; and retaining and attracting business and re-building economic vitality.<sup>5</sup>

Since the 2012 MTP/SCS, SACOG began a program of research on first tier or “mature suburbs” in the region, focused on areas where market economics may not yet be fully ripe for infill development and revitalization. This research assessed housing growth in the region by decade using Census data. As shown in Table 9.9:

- 60% of Central Cities were built before 1950
- 50% of Mature Suburbs were built from 1950 to 1979
- 50% of Newer Suburbs were built since 1980
- There was limited growth in Rural Areas in the remainder of region

TABLE 9.9

**Housing Growth by Decade**

Decade	Rural Areas	Central Cities	Mature Suburbs	Newer Suburbs
Pre-1940	9%	46%	33%	12%
1940-1949	6%	29%	52%	13%
1950-1959	4%	9%	77%	10%
1960-1969	5%	5%	76%	15%
1970-1979	6%	3%	67%	24%
1980-1989	7%	2%	36%	55%
1990-1999	6%	1%	20%	73%
2000-2009	4%	2%	11%	82%

Figure 9.2 illustrates the location of these areas in the region.

4 Sander, David, Ph.D. “Suburban Revitalization: Rebirth and the Changing Nature of Demographics & Housing.” September 2014. PowerPoint presentation. <http://sacog.org/calendar/2014/09/board/pdf/18-HANDOUT%20First%20Tier%20Suburbs%20Presentation.pdf>

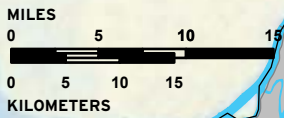
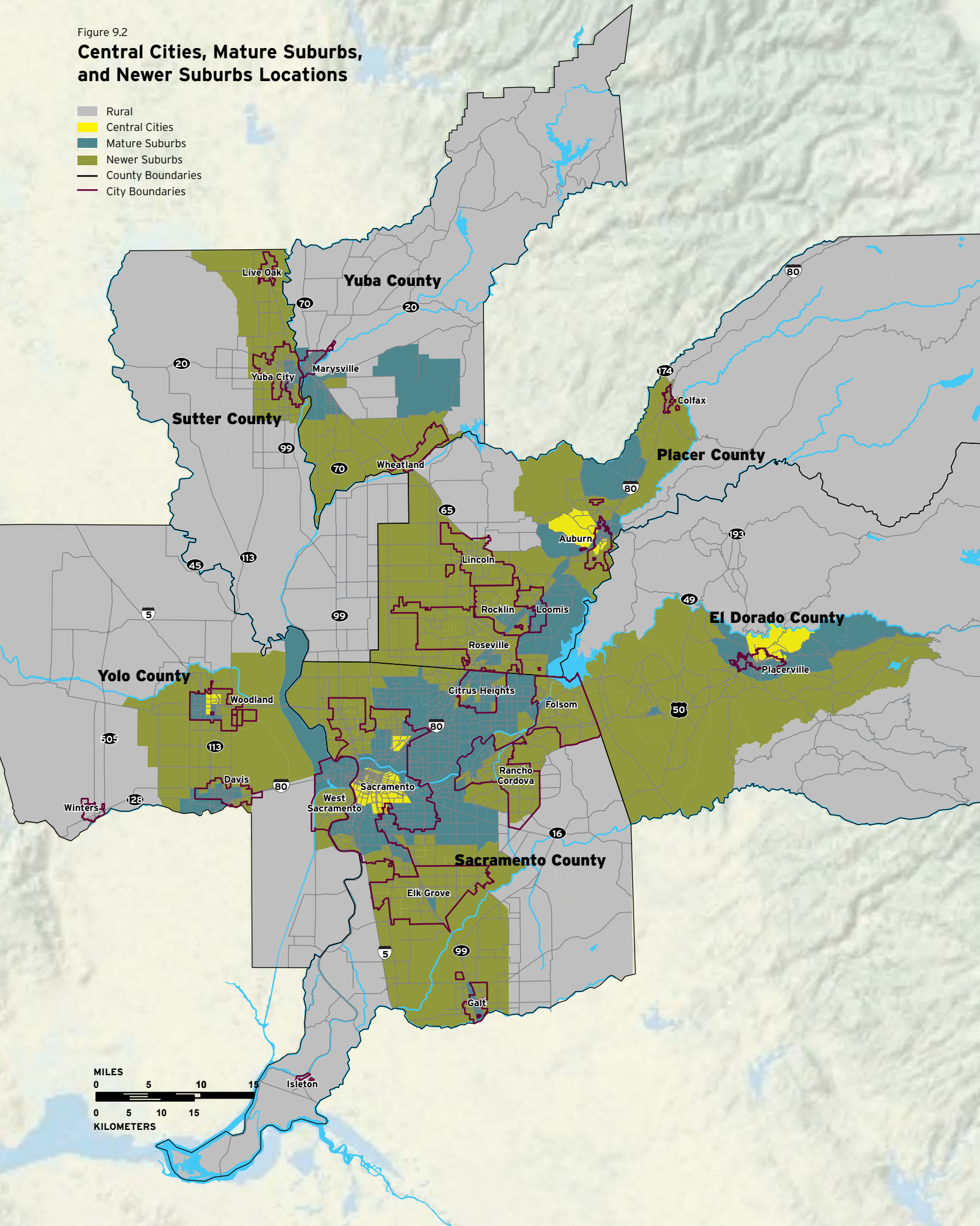
5 <http://www.nlc.org/build-skills-and-networks/networks/committees-and-councils/first-tier-suburbs-council/first-tier-suburbs-issues-of-importance>



Figure 9.2

### Central Cities, Mature Suburbs, and Newer Suburbs Locations

- Rural
- Central Cities
- Mature Suburbs
- Newer Suburbs
- County Boundaries
- City Boundaries



The age of the housing stock is a good indicator of the age of the community. Since the WWII era, most housing in a subdivision or community is built in a relatively short time period, and most of the public infrastructure - from water, sewer, and roads to schools and fire stations- is generally built at the same time as the housing. With infrastructure of the same age, and because of deferred maintenance (see the Fix it First discussion in Chapter 10), many mature suburbs face large and quickly growing costs for infrastructure upgrades or risk dramatic decreases in the quality of the community.

As shown in Table 9.10, the residents of Mature Suburbs in the region did not fare as well as other Community Types:

- Household incomes decreased more than other areas from 1990 to 2010.
- Homeownership rates declined more.
- Home values increased less than newer suburbs.
- Housing cost burden increased more, whereas in Newer Suburbs, housing costs increased more but incomes more than offset the costs.
- College education rates did not improve as much. The reasons are uncertain, since this result could be a cause of lower economic vitality (economic sectors with high education requirements are not locating in mature suburbs) or an effect (other factors have made mature suburbs less attractive for college graduates).

However, the percent of homeowners without a mortgage increased more (the cost to homeowners without a mortgage is generally 20-25% of those with mortgages).

The combination of rising public infrastructure costs and relatively lower economic resources of the residents results in mature suburbs facing the need to broaden their horizons beyond new capital projects. Thus strategies like higher priority for Fix-it-First road investments and Complete Streets programs have a growing appeal. Since 45 percent of the region's households reside in mature suburbs (Table 9.10), these funding strategies can have a significant impact on the overall transportation plan.

SACOG has begun a program of technical assistance to help Centers, Corridors and Established Communities in the region identify strategies for pursuing infill development and revitalization opportunities to address older centers, neighborhoods, and auto-oriented shopping and strip centers that may be in economic and/or physical decline, as well as commercial corridors that experience significant traffic and congestion, and could become more vibrant places with transportation improvements and other amenities.

TABLE 9.10  
**Summary of Changes from 1990 to 2010**

Indicator	Region	Central Cities	Mature Suburbs	Newer Suburbs	Rural Areas
Household Income	-2%	-2%	-8%	2%	7%
Single Family Home Value	42%	28%	37%	48%	48%
Cost for Owners with Mortgage	26%	24%	24%	28%	31%
Cost for Owners without Mortgage	23%	19%	23%	21%	33%
Pct. Homeowners	-4%	6%	-6%	-3%	-5%
Pct. Owners w/o Mortgage	9%	11%	18%	3%	-6%
Housing Cost Burden	28%	25%	36%	23%	16%
Pct. College Graduates	25%	35%	18%	26%	52%
<b># Households in 2010</b>	<b>922,837</b>	<b>61,308</b>	<b>417,902</b>	<b>392,088</b>	<b>51,539</b>
<b>% of Region's HHs</b>		<b>7%</b>	<b>45%</b>	<b>42%</b>	<b>6%</b>
<b># Census Tracts</b>	<b>521</b>	<b>34</b>	<b>235</b>	<b>222</b>	<b>30</b>

## Transportation Projects to Address Commuting and Congestion

As described in more detail in Chapter 10—Financial Stewardship, an initial phasing analysis was undertaken as part of refining the project list to identify projects which, though valuable in a longer time frame, would be candidates for re-phasing in this update to expand funding to support road maintenance and rehabilitation and reduction of VMT/congested VMT. The MTP/SCS contains a number of projects, described in more detail in Chapter 4, to address capacity needs and congestion on commute corridors through 2036. 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 60 and 58 percent in both 2012 and 2036 respectively, rising only slightly to 62 percent in 2020.
- Between 2012 and 2036, the share of commute trips made via transit increases 4 percent and 1 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 2036, compared to 2008.

These improvements will help support worker and business productivity as the economy improves while maintaining roadway conditions and capacity for rural residents and goods movement, discussed in more detail below.

## Transportation-Specific 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.<sup>6</sup> Table 9.11 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 9.11  
**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

6 [http://www.peri.umass.edu/fileadmin/pdf/published\\_study/PERI\\_ABikes\\_October2011.pdf](http://www.peri.umass.edu/fileadmin/pdf/published_study/PERI_ABikes_October2011.pdf)

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.<sup>7</sup>

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.<sup>8</sup> 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, local biking and walking tours, 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.

**Airport Planning and Encroaching Urbanization.** One of the major transportation resources that has a great impact on the region's economy is the public airport system. There are 18 general aviation airports and one military air field (Beale AFB) in the six county region. Cities and counties have adopted land use plans that allow for varying levels of urbanization near airports, and the MTP/SCS projects that some of these lands are likely to urbanize during the 20-year planning period of

7 <http://www.peri.umass.edu/236/hash/64a34bab6a183a2fc06fdc212875a3ad/publication/467/>

8 [http://www.sacog.org/complete-streets/toolkit/files/docs/NCSC\\_CS%20Spark%20Economic%20Revitalization.pdf](http://www.sacog.org/complete-streets/toolkit/files/docs/NCSC_CS%20Spark%20Economic%20Revitalization.pdf)

the MTP/SCS. As urbanization builds out towards airports on the urban fringe, safety and noise challenges arise. For this reason, the State of California passed the State Aviation Act and established Airport Land Use Commissions (ALUCs). Regional and County-wide public transportation agencies are required by State law to develop land use compatibility plans that address development near airports. These plans are based on guidelines provided by the Department of Transportation Aeronautics Division on what safety, noise and height standards are for development near airports. As individual development applications are submitted to cities and counties, SACOG as the ALUC in Sacramento, Sutter, Yolo and Yuba counties, reviews these applications for compatibility. This system ensures that airport oversight is provided by a public agency independent of the cities and counties. Appendix C-1 provides further detail on the aviation facilities in the region and the ALUC review system.

## Rural Commuting

As described in Chapter 3, the MTP/SCS projects just under 2 percent of the projected housing demand and less than 1 percent of employment demand to Rural Residential Communities during the planning period. 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 in the MTP/SCS than residents of more urbanized areas in the region. Often, destinations in these areas 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. Many of these areas do have bicycle routes, but the

majority are on the shoulder of roadways, with many routes fragmented.

Rural roadways are the backbone of the rural economies in the Sacramento Region. The transportation infrastructure in rural areas is important for the transport of agricultural and mineral resources, the movement of large farm equipment, the mobility of rural workers and residents, and connections between urbanized areas and recreation- or tourist-based economies such as those in El Dorado and Placer Counties. In many instances rural roads near or between residential neighborhoods and employment centers become ad hoc commuter routes creating a need for more intense maintenance in areas where resources are already limited.

If a significant portion of rural lands in the region continue to transition into non-agricultural uses, the network of rural county roads will experience higher traffic volumes than they are designed to accommodate. Rural transportation funding constraints are already severe, so without policies and strategies to reduce the growth in auto VMT on rural roads, there will likely be accelerated road deterioration and greater conflicts with agriculture activity. Maintenance costs, in particular, are a big burden in rural areas which account for 48 percent of the road miles in the region, but only 13 percent of the population. Targeting maintenance and improvement dollars to keep rural transportation infrastructure safe and operating efficiently is an essential part of maintaining the economic viability of rural economies. As discussed in Chapter 4, the 2016 MTP/SCS increases plan investments in road maintenance and rehabilitation by 20 percent from the 2012 MTP/SCS.

An ongoing issue in rural commute patterns is reliable, safe, and affordable transportation for the region's agricultural employees, especially field labor. 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 own-



ing 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. 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. Agriculture contributes \$2 billion per year to the regional economy. Supporting safe and reliable transportation options for workers in the agricultural industry makes sound economic sense.

## 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

The SACOG region has four freight rail systems. Union Pacific Railroad (UPRR) operates the J.R. Davis Yard in Roseville, which is the largest railyard on the West Coast. BNSF, the largest grain-hauling railroad and intermodal carrier in the U.S., has rights to operate on UPRR tracks in the SACOG region. Sierra Northern Railway (SERA) is a Class III regional railroad that interchanges with UPRR and BNSF in West Sacramento, and operates a 17-mile line between West Sacramento and Woodland, including access to the Port of West Sacramento. The California Northern Railroad West Valley Line operates 110.7 miles of north-south track between Davis in Yolo County and Tehama in Tehama County.<sup>9</sup>

With rail tonnages carried in the region forecasted to grow by two percent per year,<sup>10</sup> freight train miles traveled will also continue to increase. They are forecasted to double by 2020 and double again by 2036, 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. Major western railroads operate near capacity today, and can only compete with trucks that haul goods for more than 700 miles. Given current economic conditions, railroads are not earning a high enough rate of return to significantly expand their main-line track.

9 <http://www.dot.ca.gov/dist3/departments/planning/Systemplanning/gmstudy/CaltransD3GoodsMovementStudyFinalReport2015.pdf>, pp. 10-11

10 *Ibid.*, p. 41

## 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's primary commodities have included rice, wheat, woodchips, logs, fertilizer and cement. 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 opportunities for economic prosperity. The six-phase 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 and other facilities. The Port is also the major launching point for rice grown in the region to be exported to Asia and the Middle East.

A 2008 study estimated that the Port could handle more than 2.5 million annual tons given its infrastructure. According to a Goods Movement Study completed by Caltrans in early 2015, the Port in 2011 handled 265,000 tons of commodities, over 97% of which was bagged or bulk rice for export; forecasts are for increases to 450,000 tons by FY 2015/16, with rice continuing as the predominant commodity.<sup>11</sup> Working with UPPR, Sierra Northern Railroads, and Cemex, the Port has begun improvements to support unit trains to increase its competitiveness. Active and planned improvements at the Port should continue if good connections are to be maintained in order to meet projected demand for more rail and truck traffic that will carry containers, agricultural products and associated goods.

11 <http://www.dot.ca.gov/dist3/departments/planning/Systemplanning/gmstudy/CaltransD3GoodsMovementStudyFinalReport2015.pdf>, pp. 43-44.

## Air Cargo

Sacramento County has designated Mather Field as the region's air cargo facility, transporting over 54,000 tons in 2013. However, Sacramento International Airport handled more air cargo than Mather in 2013 at over 71,000 tons.<sup>12</sup> 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 were stalled as a result of litigation from local jurisdictions over noise issues. In June 2015, an agreement was reached between the city of Folsom and Sacramento County to explore alternative flight paths while the county continues to pursue implementation of the Mather Airport Master Plan.

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. 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. Current Caltrans projections are for an average growth in air cargo volumes of 1 percent at Sacramento International Airport

12 California Freight Mobility Plan, Appendices B-3-11 and B-3-12. [http://www.dot.ca.gov/hq/tpp/offices/ogm/CFMP/Dec2014/CFMP\\_Appendix-Complete.pdf#zoom=75](http://www.dot.ca.gov/hq/tpp/offices/ogm/CFMP/Dec2014/CFMP_Appendix-Complete.pdf#zoom=75),

and 1.7 percent growth at Mather by 2040.<sup>13</sup> 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.<sup>14</sup>

### 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 8,440 on Business 80 north of Highway 50 and 17,856 on Interstate 5. 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.

Since the 2012 MTP/SCS, SACOG utilized funding from a Strategic Growth Council grant to gather, compile, and analyze data to help deepen the region's understanding of the regional goods movement network. SACOG collected and compiled an inventory of trucking routes within the region into a geographic information

system (GIS). Prior to this effort, there was no readily available, single source of information regarding designated trucking routes by city and county for the SACOG region.

SACOG worked with Caltrans and local agency staff to identify and map roadways in the region with designations defining them as freight routes or in some way restricting freight vehicles based on length or weight. This network is made up of three primary designations, Surface Transportation Assistance Act (STAA) routes, California Legal routes, and local restricted or recommended routes. Figure 9.3 shows these regional truck routes broken down by designation.

STAA routes are specially designated roads that can accommodate large 48- to 53-foot trucks. These trucks, referred to as STAA trucks, are longer than California legal trucks and are too large for most local roads. The National Network of STAA routes consist of State and local roads with the following designations:

- National Network (NN): Primarily the interstates, also called the National System of Interstate and Defense Highways.
- Terminal Access (TA) Routes: State or local routes that have been granted access to STAA trucks. Federal law requires that states allow STAA trucks reasonable access to terminals. In the 1980's, California evaluated all State routes and allowed STAA vehicles on those routes that could accommodate them. These are called Terminal Access (TA) routes. State routes are continuously re-evaluated as improvement projects are completed. Local governments also evaluate local roads for STAA access to create local TA routes.
- Service Access Routes: Roads that allow STAA truck access for fuel, food, lodging, and repair within one road mile of a signed exit from the National Network.

The local restricted or recommended routes consist of roadways in some way limited or recommended by respective cities or counties in attempt direct trucks away from unsafe or narrow roadways and funnel them into corridors that are more suitable for their use.

Figure 9.4 shows the goods movement network and intensity of trucking in the region, measured in trucks per acre.

<sup>13</sup> <http://www.dot.ca.gov/dist3/departments/planning/Systemplanning/gmstudy/CaltransD3GoodsMovementStudyFinalReport2015.pdf>, p. 45

<sup>14</sup> SACOG Goods Movement Study, 2007







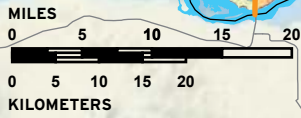
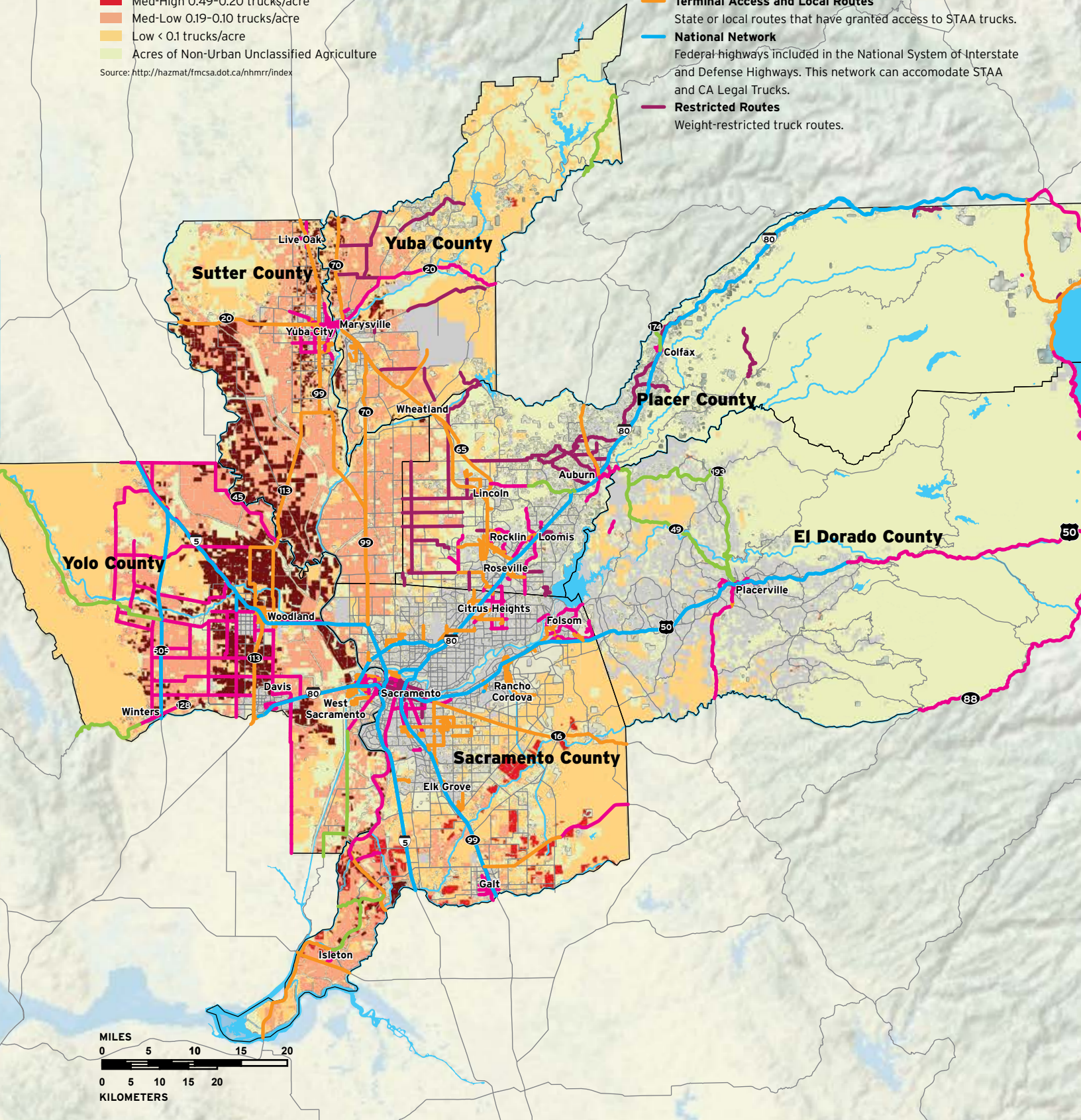
Figure 9.4

# Regional Goods Movement Network & Truck Intensity

- High > 0.5 trucks/acre
- Med-High 0.49-0.20 trucks/acre
- Med-Low 0.19-0.10 trucks/acre
- Low < 0.1 trucks/acre
- Acres of Non-Urban Unclassified Agriculture

Source: <http://hazmat/fmcsa.dot.ca/nhmrr/index>

- CA Legal Truck Route**  
A truck tractor-semitrailer (or double) that can travel on virtually any route in California.
- CA Legal Advisory Route**  
Roads that allow California Legal trucks, but are advised not to be used unless the truck's KPRA is less than 40 feet.
- Terminal Access and Local Routes**  
State or local routes that have granted access to STAA trucks.
- National Network**  
Federal highways included in the National System of Interstate and Defense Highways. This network can accommodate STAA and CA Legal Trucks.
- Restricted Routes**  
Weight-restricted truck routes.





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 Issues

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.

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.

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.

### 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.

With freight planning a largely private endeavor, it can also be challenging to address public safety concerns. For example, over the past several years, the amount of crude oil shipped by rail from various areas in North America to California has grown substantially. In Northern California, the volume of crude oil shipment by rail increased by 57 percent just in 2013. Oil companies use existing Union Pacific trains to ship crude oil to California refineries. A portion of these trains enter northern California via Donner Pass, travel along the Union Pacific rail tracks, which follow the Amtrak Capitol Corridor route through Auburn, Rocklin, and Roseville, proceed along the Sacramento River through Sacramento and Davis, and on to Bay Area refineries. Approximately 500,000 residents live and work within a half-mile of the freight rail lines operated by Union Pacific Railroad and the BNSF Railway in the larger Sacramento region.

Communities along the route identified major concerns about proposals to increase the transport of Bakken crude oil, which is more volatile and flammable than traditional crude oil, due to the significant risk of human and environmental harm should there be an incident or derailment involving these trains. It took active engagement with federal regulatory bodies to obtain more detailed information on rail proposals and to raise safety concerns. In response to such community concerns, the U.S. Department of Transportation (USDOT) in May 2014 issued an Emergency Order requiring railroad carriers to inform first responders about crude oil being transported through their towns and communities. In May 2015, after a public rulemaking process, USDOT announced a Final Rule to strengthen the safe transportation of flammable liquids by rail by requiring changes to improve accident prevention, mitigation, and emergency response.

### Increasing Truck Dimensions

The Surface Transportation Assistance Act of 1982 (STAA) authorized 48-foot and longer truck semi-trailers on National Network highways. Since that time, 53-foot STAA trailers have become increasingly prevalent in trucking operations to offer greater efficiencies for moving goods, especially for longer distances.

A 2013 study undertaken by SACOG and the San Joaquin Council of Governments for the SR 99 and I-5 Corridors found pervasive use of STAA trucks on freeways, secondary highways, and arterials in the region, yet many facilities, including freeway interchanges, sections of State Routes, local roadways, and downtown streets, lack the dimensions to accommodate these larger vehicles. Citations may be issued and fines imposed if STAA vehicles travel on routes that are not officially approved for their use. However, even where trucking companies and related uses tend to be located, the report identified only a partial STAA route network in areas studied, such as the east side of Woodland, West Sacramento, North Sacramento and the Richards Boulevard area, South Sacramento, and Galt. The final report concluded that “Local STAA routes in the study region are incomplete, disconnected, poorly documented, and inadequate to support the region’s transportation needs.”<sup>15</sup> STAA truck activity is critical to shipping/receiving and business vitality, but planning networks and upgrading critical facilities to STAA design standards will require time and money.

### 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.

<sup>15</sup> Interregional Truck Operations on I-5 and SR 99 and STAA Route Improvement Study, April 2013

- 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: 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.

### **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.

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.

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. Heavy truck traffic can take a serious toll on the surface conditions of rural roads that serve as connections between extraction/harvest locations, processing centers, and markets. Rural roads connecting to larger highways and freeways that serve as primary goods movement cor-

ridors can experience significant truck traffic as well. Most California Legal and local routes connect into the national system of STAA routes. However, these routes do not always extend to the fields or processing facilities that generate agricultural truck trips. What is more, as the larger STAA trucks become the norm rather than the exception for moving both agricultural and other goods, they are left without any choice but to travel on roadways not designated for their use. This can cause safety conflicts, damage roadways not designed to carry the weight of these heavy trucks, and result in fines and penalties for truck drivers.

### **Lack of Goods Movement Funds**

Identifying the current extent of the regional network of goods movement routes will help SACOG better identify gaps in the system and direct regional investments to begin building a connected and integrated system of farm-to-market and goods movement routes. However, 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. Federal transportation reauthorization legislation proposals released over the last year include special funding considerations for freight corridors. It is quite possible that a dedicated goods movement funding program will be included in the final reauthorization legislation for the first time. A program that includes criteria supporting smaller freight projects and projects that benefit farm-to-market travel could benefit the Sacramento region.

### 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 suggested that the region should be selective in the goods movement and logistics functions it encourages. The report divided 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 concluded 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.

## 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 worth over \$2 billion annually.<sup>16</sup>

The region's multi-billion dollar agricultural economy depends upon rural roads, highways, and freeways to realize the economic benefit of its farm-gate output. During the growing season, farmworkers use rural roads to get to work and farmers use rural roads to move farm equipment between fields. Smaller producers 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.

As such, getting a product from the farm to the consumer requires the transportation system to accommodate a variety of uses. Whereas processing plants were previously scattered around the region, today many have been consolidated, particularly in the central and southern San Joaquin Valley. Raw products are now often shipped out of the SACOG region for processing. Finished products are then trucked to distribution facilities, retailers, direct marketers, institutions, restaurants, community food banks, or straight to consumers. 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. Agricultural producers in the SACOG region also rely on the transportation system to access fast-growing export markets; indeed, agriculture is the largest export sector by value in the region, bringing over \$600 million to the regional economy from foreign exports alone. This export activity adds economic value that otherwise wouldn't be captured in the regional economy.<sup>17</sup>

Expansion in export market opportunities—especially with the continued growth of middle class markets in Asia and elsewhere—coupled with a budding local food system suggest much higher economic growth and impact in the region's agricultural sector.<sup>18</sup> 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.

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. SACOG's Sacramento Region Food Hub Feasibility analysis provides detailed economic data and business tools to support infrastructure investments in the local food system. The work shows how a food hub—one such possible infrastructure investment—can connect growers to markets, tap emerging market trends, increase the supply of fresh, healthy food, and provide a positive return of investment for investors and operators.<sup>19</sup>

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. SACOG's research has identified efficiency gaps in moving agricultural commodities from the region's rural areas to

Metropolitan Statistical Area (MSA) and the Yuba-Sutter MSA.

16 Applied Development Economics, Foodpro International, Inc. The Hatamiya Group and DH Consulting, "Sacramento Region Food Hub Feasibility Analysis: Project Summary." November 2014. <http://sacog.org/rucs/pdf/Project%20Summary.pdf>

17 Brookings, "Export Monitor 2015", <http://www.brookings.edu/research/interactives/2015/export-monitor#49700> Export levels are for year 2014. The Sacramento region includes the Sacramento

18 Applied Development Economics, Foodpro International, Inc. The Hatamiya Group and DH Consulting, "Sacramento Valley Food Hub Business Plan." August 2014, <http://sacog.org/rucs/pdf/Food%20Hub%20Business%20Plan.pdf>

19 Op cit.



consumption markets in 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 distribution 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 face their own difficulties around transportation with increased traffic on rural roads, particularly during the peak agricultural tourism season in the fall.

As noted, conflicts can arise when urban expansion moves into existing agricultural areas. From a transportation perspective, rural roadways that were designed to carry smaller volumes are not necessarily suitable for the higher volumes created by urban travel patterns. Commuters traveling to and from work can inhibit the ability to move tractors and other farm implements between fields. Heavy trucks create safety concerns when mixed with large numbers of passenger vehicles on already narrow roadways.

To better understand where these conflicts may occur and plan for them in the future, SACOG created an agricultural density map that shows where agriculture occurs and where urban expansion is beginning to influence the mix of uses adjacent to agriculture. Figure 9.5 shows the current agricultural density in the region as defined by the percent of acres dedicated to agriculture or compatible land uses within a one-mile buffer of any agricultural parcel. SACOG also works in concert with local agencies and a traffic count contractor to collect traffic counts at strategic locations through the six-county region. Ongoing monitoring of these locations can help improve regional understanding of changes in the movement of freight, particularly agricultural products, over time and from a seasonal perspective. To better direct future count efforts, SACOG will create a more focused agricultural monitoring program to improve the accuracy of counting agricultural-related truck trips for various crop types of interest in the SACOG region.

SACOG will use the data supporting the agricultural intensity map to compare against future land use scenarios. Identifying areas of potential future conflict early can help local jurisdictions plan infrastructure improvements, or future land use decisions, in a way

that mitigates these challenges by maintaining dedicated farm-to-market routes or designing roadways to safely and efficiently accommodate a mix of agricultural and non-agricultural uses.

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.

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. However, to support growth in this sector, transportation investments will need to be considered strategically for rural roads where transportation forecasts predict demand from agricultural-related workers and particularly heavier trucks and farm equipment that have greater impact on rural roads.

Knowing where existing trucking routes exist is only part of the solution to building a more integrated system of trucking corridors. An additional valuable piece of information includes how trucks and other traffic are using designated trucking routes, as well as if there are other non-designated routes in the region that are carrying significant volumes of trucks. Knowing where truckers are and how roadways are used will help identify strategic investments that connect new routes into the system or attract truckers to more suitable routes. Additionally, roads with higher truck volumes, particularly aging rural roads, are more susceptible to pavement deterioration from the high weight vehicles. Identifying these roads could be helpful in prioritizing limited maintenance budgets in rural areas that may not have access to more robust pavement management systems.

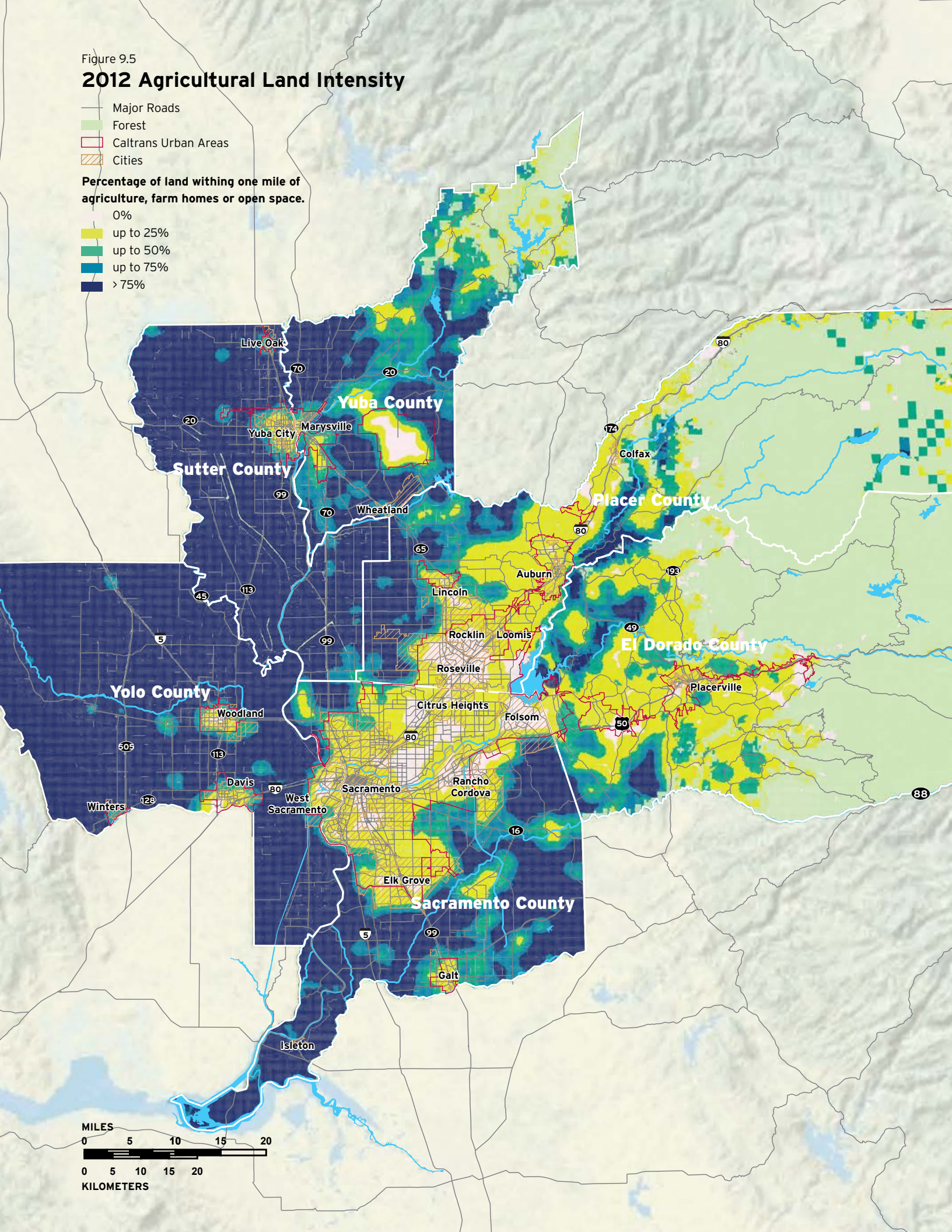
Figure 9.5

# 2012 Agricultural Land Intensity

- Major Roads
- Forest
- Caltrans Urban Areas
- Cities

Percentage of land within one mile of agriculture, farm homes or open space.

- 0%
- up to 25%
- up to 50%
- up to 75%
- > 75%





### **Greater Regional Planning and Coordination**

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 through 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. The MTP/SCS seeks to address growth in passenger traffic to help preserve adequate capacity for goods movement needs. A recent study of the Highway 99 and Interstate 5 corridors, Caltrans District 3's 2015 Goods Movement Study, and a new Caltrans grant-funded joint study between the Metropolitan Transportation Commission, San Joaquin Council of Governments, and SACOG on Goods Movement and Industrial Lands Access and Efficiency in Northern California will also update and inform future MTP/SCS.

## CHAPTER 10

# Financial Stewardship

## Introduction

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 growing 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. The California State Transportation Agency has identified system preservation as a major priority in the 2014 California Transportation Infrastructure Priorities: Vision and Interim Recommendations. According to the 2014 California Statewide Local Streets and Roads Needs Assessment,<sup>1</sup> 54 out of 58 counties in California contain roads that 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 latest assessment, the region's average pavement condition index worsened into the low 60s. Roads with scores between

1 Nichols Consulting Engineers, Chtd. et al (2014) California Statewide Local Streets and Roads Needs Assessment. Retrieved from <http://www.savecaliforniastreet.org/>

50 and 70 are considered at risk and require more costly repairs than typical routine preventive 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.<sup>2</sup> 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 than preventive maintenance. Routine maintenance on a road generally costs between \$20,000 and \$40,000 per lane mile and can take place every couple of years. Heavier maintenance such as overlays can cost anywhere from \$100,000 to \$200,000 per lane mile. 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 linear mile.<sup>3</sup> 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 activi-

ties. Between 2000 and 2011, local governments in the SACOG region spent approximately \$3.2 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 about 8 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 2011, the latest year for which data are available, local government expenditures were nearly \$200 million for maintenance and \$120 million for reconstruction (\$318 million combined).<sup>4</sup>

Deferred maintenance problems vary widely across the region and funding mechanisms 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 especially struggle to find resources to pay for maintenance and 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, much of which is still fairly new. However, such cities will need to attend to an increasing load of preventive maintenance to stay ahead of the curve.

### 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. Historically, federal and

<sup>2</sup> FHWA Vehicle Classes with Definitions: Equivalent Single Axle Load

<sup>3</sup> Nichols Consulting Engineers, Chtd. et al (2014) California State-wide Local Streets and Roads Needs Assessment. Accessed from <http://www.savecaliforniastreet.org/>

<sup>4</sup> 2011 State Controller's Report data



state money have not helped to pay for 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 \$12.6 billion (\$16.3 billion YOY) 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. A new future sales tax in Placer County would also likely help offset maintenance needs in that county. Another promising source of new funding is the State's new Affordable Housing & Sustainable Communities grant program that is supported by Cap and Trade revenues. Analysis completed through the MTP/SCS update process suggests there is an opportunity to prepare competitive funding applications for complete streets projects along roadways that also have maintenance and rehabilitation needs. Funds awarded would be a win-win for local agencies that expand multi-modal travel options at the same time they bring the roadway up to a state of good repair.

The MTP/SCS policies and strategies in Chapter 65 reinforce the priority for addressing chronic road maintenance/Unfortunately, even with the strategies contained in the plan, resources for road maintenance will not keep pace with escalating costs and there will likely be a continued 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 reliable, ongoing funds available for maintenance are local shares of the gas tax, sales tax funds, and local general funds. Maintenance and rehabilitation consume upwards of 70 percent of the typical local road budget today, leaving 30 percent for any local improvements and new construction.

SACOG estimates that at least an additional \$150 to \$250 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.

This MTP/SCS represent a large step forward from previous plans toward keeping the region's roadways in a state of good repair. SACOG conducted a detailed review of potential road and highway expansion projects as part of this plan update to reduce the total expenditures spent on system expansion in favor of a more focused approach on system preservation. Many proposed expansion projects were delayed or otherwise downsized in this plan in favor of reducing future maintenance burdens and freeing up funding to help pay for maintenance and rehabilitation. Expansion projects included in the plan are primarily those with significant performance benefits, such as eliminating traffic bottlenecks, or those that are needed to connect new development into the existing transportation system.

Despite the steps taken in this plan, there still exists a need to conduct additional research on pavement maintenance needs in the SACOG region. Moving forward, SACOG will work towards compiling an inventory of pavement conditions and other maintenance needs throughout the region. The information is intended to be a valuable reference for regional and local planning efforts to match available funds to the roads with the greatest need for maintenance and rehabilitation.

### **Funding Challenges for Transit Operations**

Transit services play a vitally important role in supporting the implementation of 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 2012, the 14 transit services in the region spent about \$187 million to operate fixed route and dial-a-ride services. These operating costs include drivers, mechanics, dispatching, fuel, parts, supplies, services, and administration. In contrast, prior to cuts in transit services made in response to lost revenues during the recession, annual operating costs exceeded \$205 million in 2008. The drop in oper-

ating costs corresponded to a 14% reduction in annual vehicle service hours.

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. By 2020, the MTP/SCS plans for a transit system with an annual maintenance and operations cost of roughly \$240 million (\$264 million YOY); an increase of almost 30 percent over today. 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. Operators must balance the need to raise revenue with the ability of transit-dependent riders to pay when making decisions about how to expand service. In the SACOG region, the regional average for farebox recovery was 25 percent in 2012. 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 paid by passengers vary widely in the SACOG region, with discounts usually offered for seniors, students, and persons with disabilities, which reduces total fare revenue captured by operators. With base fares ranging from \$1.50 to \$2.50 per ride for basic bus and light rail service, factoring in discounts results in an average fare collected per rider between \$0.90 and \$1.10 region wide.

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 that pay full fares, 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 preventive 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 vary with the ups and downs in the economy. A significant percentage of total existing operating revenues for the region's operators come from two volatile sales taxes sources:

- Transportation Development Act (TDA)/Local Transportation Funds (LTF) from a 1/4-cent sales tax for transportation authorized by the state TDA;
- Sacramento County's Measure A, a 1/2-cent county transportation sales tax.

During the recession, sales tax receipts declined significantly and caused operators to make difficult decisions to cut services. As the economy has recovered, sales tax receipts have increased as well, though not fully back to pre-recession levels. However, without a stable funding source, future swings in the economy will likely present a challenge to transit operators. The MTP/SCS includes an assumption for a new 1/2-cent sales tax equivalent in Sacramento County, half of which would support new transit service in the plan.

### Funding Challenges for Transit Capital

The challenges related to funding transit capital needs relate largely to the timing of needs versus the timing of funds available to pay for them. The MTP/SCS includes \$3.5 billion (\$4.7 billion YOY) for transit capital, including the purchase of replacement and expansion vehicles. This amount covers anticipated needs; however it is dependent on new funding sources, such as potential sales tax revenue, to help offset the transfer of funds to operations that could otherwise be spent capital needs. Finding near term funding sources for replacing vehicles is a major challenge given the magnitude of needs over the next 10 years.

- Roughly three quarters of the region's current

fleet of more than 500 transit buses need to be replaced in the next five to ten years. This number does not include the purchase of new expansion buses to accommodate planned new service.

- The region's existing fleet of roughly 200 para-transit shuttles and small buses have a fairly short 5-year recommended lifecycle and will likely require \$40 to \$50 million in replacement vehicles over the next 10 years.
- Half of the light rail vehicles operated by Sacramento Regional Transit District were built in the late 1980s or early 1990s. Regional Transit estimates the total need for maintenance, major overhauls, and replacements of light rail vehicles will exceed \$200 million over the next 10 years.
- 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 50 new streetcar and light rail vehicles by 2036 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

While virtually no increases in transit services are forecasted for the first ten years of the MTP/SCS planning period due to revenue constraints, more robust growth is forecasted in later years. By 2020, transit operations expenditures will be only slightly higher than in the 2012 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 in Center and Corridor and Established Communities to support higher ridership. By 2035, the MTP/SCS calls for approximately \$420 million (\$740 million YOE) in operations funding to provide more than double the 2012 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 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 25 percent of operating costs in 2012 to roughly 38 percent of operating costs by 2036. 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 is RT's Comprehensive Operational Analysis that planned 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, state cap and trade funding, and a new half-cent transportation sales tax equivalent in Sacramento County beginning in 2020, with half of the revenue going to supporting transit operational and capital needs. An assumed half-cent sales tax in Placer County could also help to pay for or at least offset some of the costs of an expanded transit network in that county.

## 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 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.

Road programs struggle to find funding for all of the demands placed on them and in many cases road expansion must compete with road maintenance, rehabilitation, and operations for limited resources. 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.

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 9 percent from the 2012 MTP/SCS. Strategic road capacity projects included in the MTP/SCS are intended to address major existing bottlenecks or are closely tied to the land use and growth pattern assumed for the plan.

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 and more efficient use of resources. 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.

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. Increased development density Better positions transit to serve commute and errand 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, carpool lanes, 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 6 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 2012 with planned TDM program expansions by 2036.

TABLE 10.1

**Transportation Demand Management (TDM) in the MTP/SCS**

Policy or Program	In 2012	By 2036
Transportation Management Agencies	Thirteen 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	Limited 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	2012	By 2036
Ramp Metering	Meters in 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 2036 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. Example ITS projects 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 has deployed 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). 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 2016.

## Road, Bike and Pedestrian Safety

The Moving Ahead for Progress in the 21st Century (MAP-21) requires that 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; road-side 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.

Safety 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 state-wide. 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 well over \$1 billion in current year dollars 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. Dedicated bike facilities, crossings, signalization, and other measures included in the MTP/SCS help to improve bicycle and pedestrian safety. Local and regional policies to include consideration of complete streets in the planning, construction, and operation of transportation projects can go a long way in addressing conflicts that can lead to incidents on the transportation system.

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 \$830 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 \$1.7 billion, including:
  - Addition of turn lanes at Covell Blvd./Hwy. 113 that includes access-egress to Hwy. 113
  - Improvements to at-grade rail crossings
  - Replacement of structurally deficient bridges throughout the region
- Expanded and new facilities: New and widened roads and highways in the MTP/SCS will need to consider safety as they are planned, built, and operated. Safety considerations could include

ADA accessibility, separation of bicycles and pedestrians from faster moving traffic, intersection signalization, and traffic calming, among other strategies.

### **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-validated 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.

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.

In the SACOG region, serious collisions (defined as collisions that result in injury or death) have been declining over the last several years. The total number of fatal or injury collisions reported in the six-county Sacramento region from 1998 to 2010 is shown in Figure 10.1. Serious collisions peaked in 2004 and have declined every year since 2004. Normalized to VMT, the decline since 2004 averages 5 percent per year.

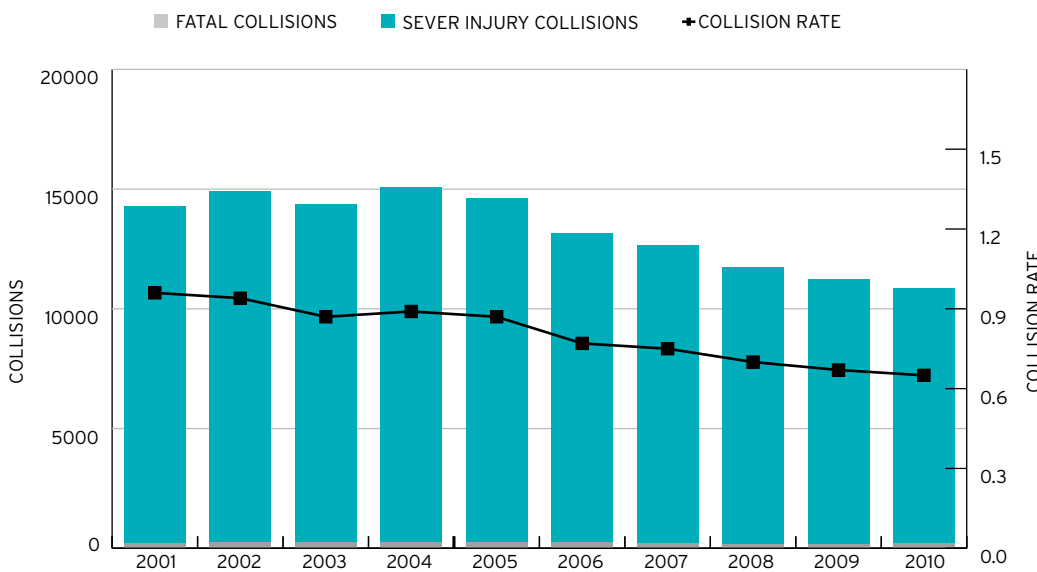
Many factors have contributed to the overall and per VMT declines in serious collisions. While VMT has been decreasing in recent years, it has not been decreasing at nearly the same rate as serious collisions. Some other explanations for this decline include safer vehicles, stricter enforcement of drunk driving laws, new regulations and campaigns to limit distracted driving, and graduated drivers' licensing. In addition, roadway construction and maintenance practices today pay



more attention to safety, with features like rumble strips and cable median barriers to separate cars from oncoming traffic.

Obviously, this downward trend in the overall collision rate is no argument for complacency, and all agencies must continue to prioritize safety in planning, design, construction, operation, and maintenance of facilities.

**FIGURE 10.1**  
**Fatal and Injury Collisions, 1998 to 2010**



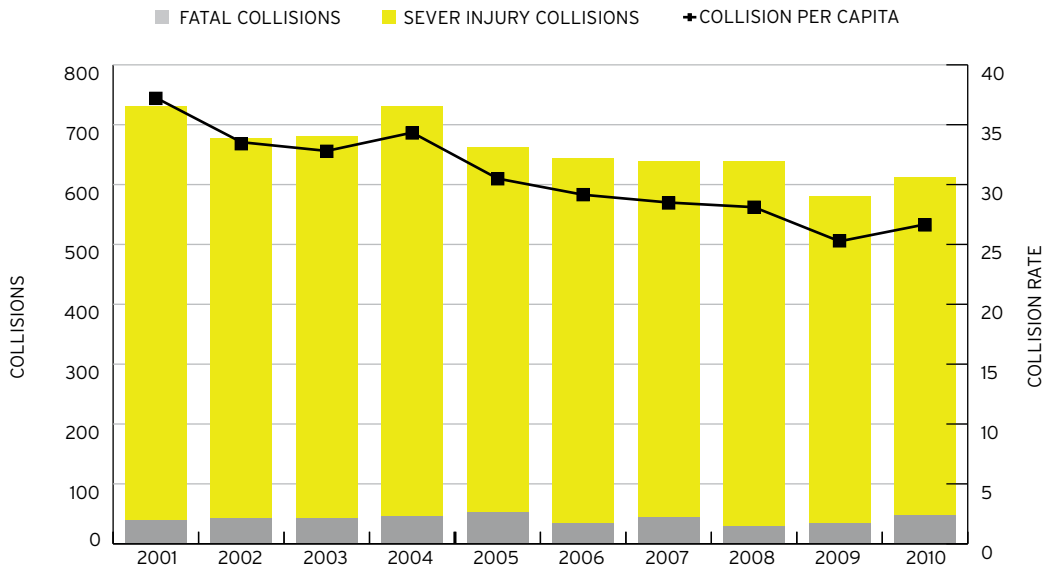
\*Fatal and injury collisions per one million miles traveled.

Incidents involving bicyclists and pedestrians are difficult to track since many go unreported. However, for those that are reported, data shows that incidents have generally declined over time in the region. Figure 10.2 shows that both total and per-capita pedestrian-involved collisions, which had been declining since 2004, increased in 2010, from 581 to 612. The actual number of collisions in any given year is due to many factors, including: 1) exposure (i.e. how many pedestrians are on the region’s transportation system; 2) changes in driver or pedestrian behavior; 3) improvements to the region’s pedestrian or roadway facilities; or 4) random variation. Any or all of these factors could explain the downward trend, but with the current data sources available there is no way to decisively explain the causes behind changes from year to year.

Figure 10.3 shows bicycle-involved collisions and collisions-per-100,000-residents. Total and adjusted collisions both declined from 2002 to 2005, then increased from 2006 to 2008, and declined again in 2009 and 2010. The interpretation of these changes is subject to the same limitations and caveats as the pedestrian-involved collisions.

FIGURE 10.2

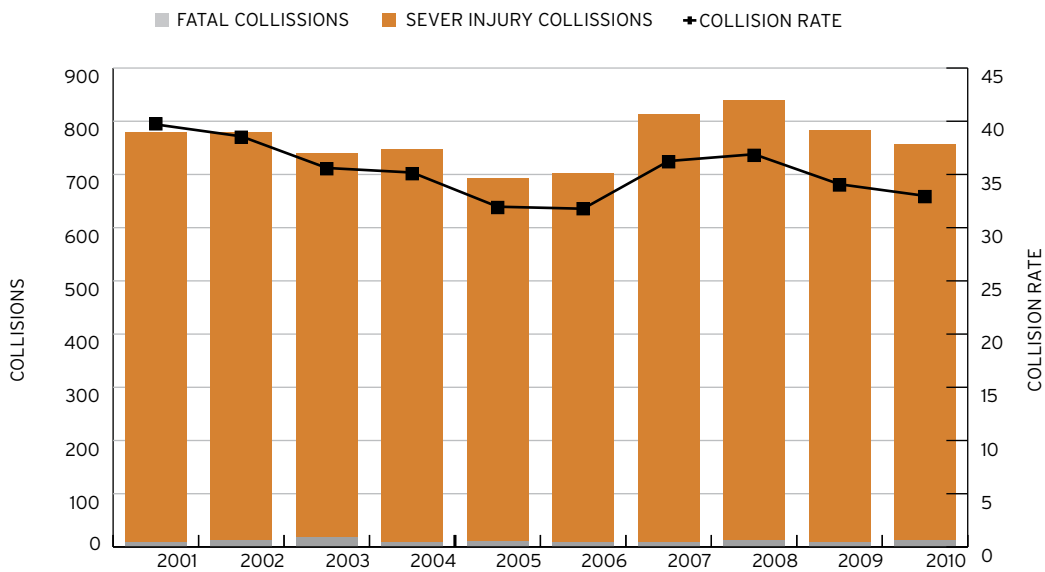
**Pedestrian-Involved Fatal and Injury Collisions, 2001 to 2010**



\*Collision rate is the number of fatal and injury collisions involving a pedestrian, per 100,000 persons.

FIGURE 10.3

**Bicycle-Involved Fatal and Injury Collisions, 2001 to 2010**



\*Collision rate is the number of fatal and injury collisions involving a pedestrian, per 100,000 persons.

Based on "Annual Report(s) of Fatal and Injury Motor Vehicle Traffic Collisions" by the California Highway Patrol.

## Transportation Security & Emergency Preparedness

Improved maintenance of the region's transportation system also includes addressing public safety and security concerns. With MAP-21 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 2014 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 2014 burned nearly 555,000 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 employ-

ment 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.

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 is assisting 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 staff worked with regional transit partners in developing 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 allows 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.







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