

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,¹ 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.² The volume of trucks using the transportation system is growing: heavy truck travel has been increasing at a significant rate since 1990.

Adequate road maintenance and rehabilitation is costly, but needs to be done on a regular schedule to prevent even higher costs. On average, reconstructing a road that has deteriorated to a poor condition can cost 20 times more 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.³ 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).⁴

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

² FHWA Vehicle Classes with Definitions: Equivalent Single Axle Load

³ Nichols Consulting Engineers, Chtd. et al (2014) California State-wide Local Streets and Roads Needs Assessment. Accessed from <http://www.savecaliforniastreet.org/>

⁴ 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 operating 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 approx-

imately \$420 million (\$740 million YOY) 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.

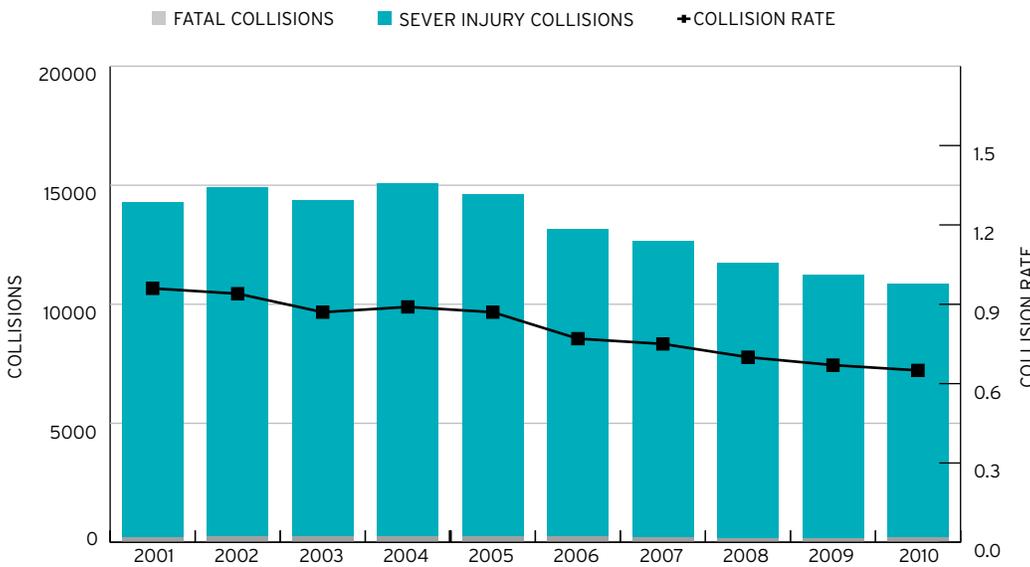
In the SACOG region, serious collisions (defined as collisions that result in injury or death) have been declining over the last several years. The total number of fatal or injury collisions reported in the six-county Sacramento region from 1998 to 2010 is shown in Figure 10.1. Serious collisions peaked 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



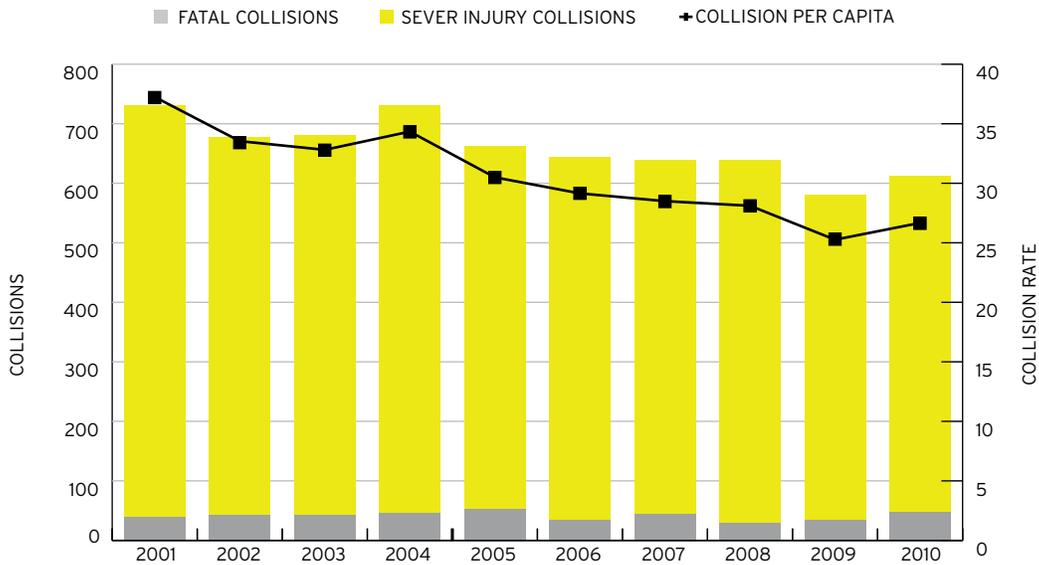
*Fatal and injury collisions per one million miles traveled.

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

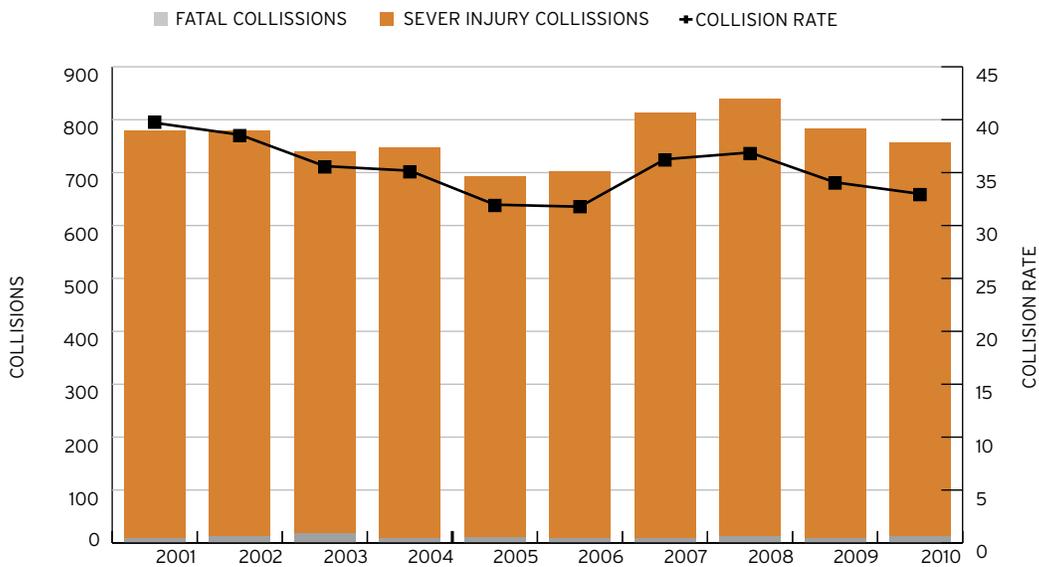
Pedestrian-Involved Fatal and Injury Collisions, 2001 to 2010



*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.