

CONGESTION MANAGEMENT APPENDIX



REGIONAL TRANSPORTATION PLAN
2012-2035 RTP
SUSTAINABLE COMMUNITIES STRATEGY
Towards a Sustainable Future



Southern California Association of Governments
ADOPTED APRIL 2012

CONGESTION MANAGEMENT

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Introduction

The United States Safe, Accountable, Flexible, Efficient Transportation Equity Act, a Legacy for Users (SAFETEA-LU) requires development, establishment and implementation of a Congestion Management Process which is fully integrated into the regional planning process.

The Federal Highways Administration defines the congestion management process as a “systematic approach . . . that provides for effective management and operation, based on a cooperatively developed and implemented metropolitan-wide strategy, of new and existing transportation facilities eligible for funding under title 23 U.S.C., and title 49 U.S.C., through the use of operational management strategies.”

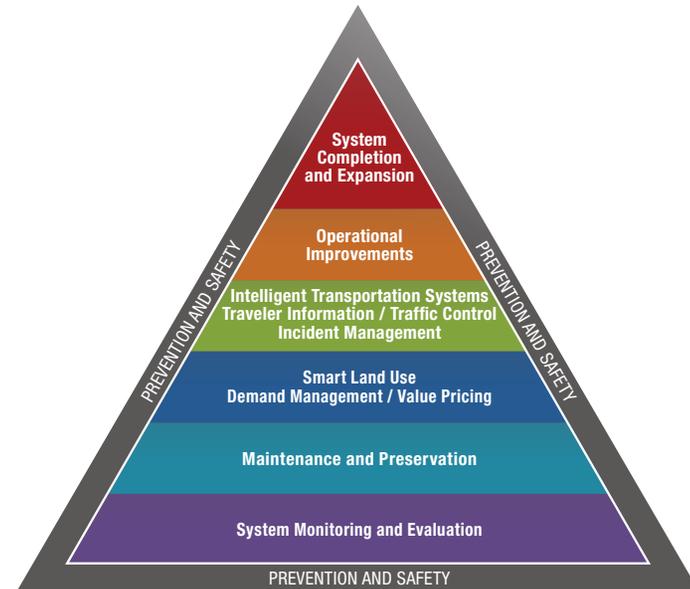
In compliance with the sections of the Metropolitan Planning Regulations [23 U.S.C. 134 and 49 U.S.C. 5303–5305], SCAG has made the Congestion Management Process an integral part of the regional transportation planning process, including the Regional Transportation Plan (RTP) and the Federal Transportation Improvement Program (FTIP).

The congestion management process is part of SCAG’s integrated approach to improving and optimizing the transportation system (as shown in Figure 1) to provide for the safe and effective management of the regional transportation system through the use of monitoring and maintenance, demand reduction, land-use, operational management strategies and strategic capacity enhancements.

The Regional Congestion Management Elements described in this report are:

- The Congestion Management Programs from five county transportation commissions and the (draft) Imperial County Transportation Plan
- Objectives and Performance Measures for the RTP
- Transportation Demand Management
- Transportation System Management
- Land Use Strategies
- Regional Transit Strategies
- Regional Goods Movement Strategies
- The Federal Transportation Improvement Program.

FIGURE 1 Mobility Pyramid



The SCAG Region

The SCAG region is the largest metropolitan region in the United States of America, encompassing 38,000 square miles, six counties and 191 cities.

There are 9,424 miles of freeways in the region, with 1,033 miles of carpool lanes. In addition, there are almost 39,000 miles of arterial roadways. There are 10 commercial service airports in the region and another 45 general aviation airports. Los Angeles International Airport ranked fifth busiest in passengers worldwide in 2007. Over 5,400 buses operate in the region, with almost 1.2 million boardings each weekday. Metro Rail and Metrolink add over 300,000 daily weekday boardings at 110 stations.

In addition, the three seaports in the region, the Ports of Hueneme, Long Beach and Los Angeles account for over 40 percent of all maritime trade in the United States.

Regional Conditions

In the SCAG region, the Los Angeles, Orange, Riverside, San Bernardino, and Ventura counties are contained within the transportation management area (TMA). The County Transportation Commission in each county also functions as the Congestion Management Agency (CMA) under California requirements.

To meet the federal CMS requirements, SCAG and the county CMAs have come together to develop a CMS process for the region. Under California law, the Congestion Management Programs (CMPs) are prepared and maintained by the respective CMAs:

- The Los Angeles County Metropolitan Transportation Authority (LACMTA)
- The Orange County Transportation Authority (OCTA)
- The Riverside County Transportation Commission (RCTC)
- The San Bernardino Associated Governments (SANBAG)
- The Ventura County Transportation Commission (VCTC)

Imperial County, which is not a CMA, is included in the CMP development as it is urbanizing and beginning to have congestion issues, most notably near the international border with Mexico.

With the exception of small portions of Riverside and San Bernardino counties, all counties contained within the TMA are designated as ozone non-attainment areas. In addition, the entire South Coast Air Basin (SCAB) is designated as a carbon monoxide non-attainment area. SCAB covers the urbanized portions of Los Angeles, Orange, Riverside, and San Bernardino counties.

Finally, Imperial County, which does not yet have the legal population minimum for CMA incorporation is in a non-attainment status for ozone.

Federal funds may not be programmed in the carbon monoxide and ozone non-attainment areas of the Transportation Management Areas (TMAs) for any project resulting in significant increase in single occupant vehicle (SOV) capacity unless that project is based on a CMS. In the SCAG region, the federally approved and conforming RTP functions for this purpose.

The CMPs interlink with the Air Quality Management Plan (AQMP) in several areas, but most particularly through the Transportation Control Measures (TCMs). Most TCM

projects identified in the FTIP are designed to help relieve congestion at the local level. Thus, implementation of the AQMP helps local governments tackle congestion, which, in turn, reduces emissions from idling vehicles or the number of vehicles traveling on congested roadways, and also helps maintain the level of service standards. At the same time, the CMP process provides local governments a mechanism to contribute to the regional effort toward attaining the NAAQS.

County CMP Activities

Highway Performance: Each CMA monitors the performance of their identified highway system. This allows each county to track how their systems, and their individual components, are performing against established standards, and how performance changes over time. At a minimum, all State highways are required to be monitored. In practice, the California Department of Transportation (Caltrans) monitors State highways and the Interstate system within the SCAG region. Counties and cities monitor major arterials that are part of the CMP network. Once a roadway becomes part of the CMP network, it cannot be removed.

The regional CMP Network consists of all the county networks. It includes all freeways, State highways, and key arterials.

In each county's congestion management plan the level of service is recorded for all roadways in the CMP network in accordance with California Government Code 65089. Imperial County also included levels of service on major roadways in its Long Range Transportation Plan update.

Each County updates their CMP every two years. Imperial County updated its Transportation Plan in 2007, and the 2012 update is currently in draft form.

TABLE 1 County Congestion Management Plans

County	Plan	Completed
Imperial	Transportation Plan	2012*
Los Angeles	Congestion Management Plan	2010
Orange	Congestion Management Plan	2011*
Riverside	Congestion Management Plan	2010
San Bernardino	Congestion Management Plan	2012*
Ventura	Congestion Management Plan	2011*

*Draft

Outside the State CMP requirements, the federal regulations require establishment of a traffic monitoring system (TMS). It is the responsibility of the State, the California Department of Transportation (Caltrans)—working with the metropolitan planning organizations (MPOs), and local agencies—to develop a TMS. Caltrans, in accordance with AB 1963, is required to monitor the LOS along the State Highway facilities. Counts along the local arterial system is provided by the relevant local agencies. The Immigration and Customs Enforcement monitors border crossings.

In 2002, SCAG developed the initial component of a Regional Transportation Monitoring Information System (RTMIS). The initial component includes the continuous downloading of the PeMS (Performance Measurement System) data and access to (Highway Performance monitoring System) HPMS data in the region. While the PeMS data is limited to freeways only, the HPMS data encompasses all federal-aid system including freeway system and selected arterials. The HPMS program is a joint effort of the Federal, State, MPO, and local governmental agencies.

SCAG coordinates submittal of the HPMS data update with the local jurisdictions. Annually through the HPMS program, SCAG submits over five thousand sheets for updating data to cities and counties in Southern California. After reviewing the updated sheets for accuracy and completion, SCAG submits them to Caltrans. In compliance with the federal regulations, Caltrans uses the new information to update its HPMS Annual Report.

Every year, the Federal Highway Administration (FHWA) uses the states submitted Annual Reports for reporting to Congress.

SCAG and its counties use this data to update their transportation models. SCAG's modeling task force, made up of member organizations, meets regularly to ensure consistency between the SCAG transportation model and county transportation models.

Caltrans, in conjunction with the California Highway Patrol (CHP), has created Transportation Management Centers (TMCs) to monitor daily conditions and non-recurring congestion.

With the help of electronic technologies such as electronic sensors in the pavement, freeway call boxes, video cameras, 911 calls, officers on patrol, Caltrans highway crews, ramp meter sensors, earthquake monitors, motorist cellular calls, and commercial traffic reports, the TMC provides coordinated transportation management for normal commutes, special events and incidents affecting traffic. Much of the data is being archived through Los Angeles County's Regional Integration of ITS Systems (RIITS) which should provide greater accuracy in the data collected and modeled.

The TMCs are operated within each Caltrans district. For the SCAG region, Districts 7, 8, 11, and 12 all have TMCs.

Deficiency Plans: When unacceptable levels of congestion occurs, the respective CMP contains a set of provisions for a "deficiency plan" to address the problems. Deficiency plans can be developed for specific problem areas or on a county-wide-system basis. Projects implemented through the deficiency plan must, by statute, have both mobility and air quality benefits. In many cases, the deficiency plan captures the benefits of the transportation projects that occur beyond the SCAG FTIP such as non-federally funded / non-regionally significant projects.

Objectives and Performance Measures

Each county and SCAG have objectives and performance measures. The most common performance measure used by counties is Level of Service (LOS) which is a required measure by California Government Code 65089. The LOS performance measure attaches a letter grade to a roadway based on the level of congestion.

TABLE 2 Level of Service Definition

LOS	Flow Conditions	Operating Speed	Delay	Service Rating
A	Highest Quality of Service. Free Traffic Flow, low volumes/densities. Little or no restriction on speed or maneuverability	55+	None	Good
B	Stable traffic flow, speed becoming slightly restricted. Low restriction or maneuverability	50	None	Good
C	Stable traffic flow, but less freedom to select speed, change lanes or pass. Density increasing	45	Adequate	Adequate
D	Approaching unstable flow. Speeds tolerable but subject to sudden and considerable variation. Less maneuverability and driver comfort.	40	Adequate	Adequate
E	Unstable traffic flow with rapidly fluctuating speeds and flow rates. Short headways, low maneuverability and low driver comfort	35	Significant	Poor
F	Forced traffic flow. Speed and flow may drop to zero with high densities.	<20	Considerable	Poor

SCAG uses additional performance measures to determine the efficiency of the highway system, including:

- Average Daily Speeds
- Average Daily VMT
- Average Daily Delay
- Average Daily Heavy Duty Truck Delay
- Average Person Trip Length.

TABLE 3 2012 RTP Outcomes and Performance Measures/Indicators

Outcome	Performance Measure/ Indicator	Definition	Performance Target	Data Sources Used
Location Efficiency	Share of growth in High Quality Transit Areas (HQTAs)	Share of the region's growth in households and employment in HQTAs	Improvement over No Project Baseline	Census (including annual American Community Survey), InfoUSA
	Land consumption	Additional land needed for development that has not previously been developed or otherwise impacted, including agricultural land, forest land, desert land and other virgin sites	Improvement over No Project Baseline	Rapid Fire Model
	Average distance for work and non-work trips	The average distance traveled for work or non-work trips separately	Improvement over No Project Baseline	Travel Demand Model
	Percent of work trips less than 3 miles	The share of total work trips which are fewer than 3 miles	Improvement over No Project Baseline	Travel Demand Model
	Work trip length distribution	The statistical distribution of work trip length in the region	Improvement over No Project Baseline	Travel Demand Model
Mobility and Accessibility	Person delay per capita	Delay per capita can be used as a supplemental measure to account for population growth impacts on delay.	Improvement over No Project Baseline	Travel Demand Model
	Person delay by facility type (mixed flow, HOV, arterials)	Delay – excess travel time resulting from the difference between a reference speed and actual speed.	Improvement over No Project Baseline	Travel Demand Model
	Truck delay by facility type (Highway, Arterials)	Delay – excess travel time resulting from the difference between a reference speed and actual speed.	Improvement over No Project Baseline	Travel Demand Model
	Travel time distribution for transit, SOV, HOV for work and non-work trips	Travel time distribution for transit, SOV, HOV for work and non-work trips	Improvement over No Project Baseline	Travel Demand Model
Safety and Health	Collision/accident rates by severity by mode	Accident rates per million vehicle miles by mode (all, bicycle/pedestrian and fatality/killed)	Improvement over Base Year	CHP Accident Data Base, Travel Demand Model Mode Split Outputs
	Criteria pollutants emissions	CO, NO _x , PM _{2.5} , PM ₁₀ , and VOC	Meet Transportation Conformity requirements	Travel Demand Model/ARB EMFAC Model
Environmental Quality	Criteria pollutants and greenhouse gas emissions	CO, NO _x , PM _{2.5} , PM ₁₀ , and VOC Greenhouse gas emissions (CO ₂)	Meet Transportation Conformity requirements and SB375 per capita GHG reduction targets	Travel Demand Model/ARB EMFAC Model

Outcome	Performance Measure/ Indicator	Definition	Performance Target	Data Sources Used
Economic Well Being	Additional jobs supported by improving competitiveness	Number of jobs added to the economy as a result of improved transportation conditions which make the region more competitive	Improvement over No Project Baseline	Regional Economic Model REMI
	Additional jobs supported by transportation investment	Total number of jobs supported in the economy as a result of transportation expenditures.	Improvement over No Project Baseline	Regional Economic Model REMI
	Net contribution to Gross Regional Product	Gross Regional Product due to transportation investments and increased competitiveness	Improvement over No Project Baseline	Regional Economic Model REMI
Investment Effectiveness	Benefit/Cost Ratio	Ratio of monetized user and societal benefits to the agency transportation costs	Greater than 1.0	California Benefit Cost Model
System Sustainability	Cost per capita to preserve multi-modal system to current and state of good repair conditions	Annual costs per capita required to preserve the multi-modal system to current conditions	Improvement over Base Year	Estimated using SHOPP Plan and recent California Transportation Commission 10-Year Needs Assessment

HOV = high occupancy vehicle, SOV = single occupancy vehicle

Performance measures tied to goals for reliability, preservation, productivity, health, energy efficiency, and security cannot currently be reliably forecasted and are not included in Table 3. However, SCAG has identified related measures to be used for monitoring purposes, and these are discussed in the Performance Measures technical report.

In addition to highway performance, each CMP contains an element to evaluate the performance of other transportation modes including transit.

Transit Performance Measures

Each county examines performance measures related to Transit performance. These include:

- Total Operating Costs
- Fare Revenue
- Revenue Hours
- Revenue Miles
- Total Passengers
- Passengers/Revenue Mile
- Passengers/Revenue Hour
- Cost/Passenger
- Cost/Hour
- Average Fare/Passenger
- Subsidy/Passenger
- Fare box Recovery Ratio

Transportation Demand Management

Transportation Demand Management (TDM) is the all-inclusive term given to a variety of measures used to improve the efficiency of the existing transportation system by managing travel demand, including carpooling, transit, High Speed Rail, telecommuting and non-motorized transportation. In the 2012 RTP, SCAG is allocating \$4.7 billion in TDM investments.

The RTP commits \$4.7 billion to fully implement TDM strategies throughout the region in the following key areas:

1. Reduce the number of single-occupancy vehicle trips through Rideshare (carpooling and vanpooling).
2. Redistribute vehicle trips from peak demand periods to non-peak periods via telecommuting or alternative work schedules.
3. Reduce the number of single-occupancy vehicle trips through selection of other modes of travel such as transit, bicycling or walking

The SCAG region continues to invest heavily in High Occupancy Vehicle (HOV) infrastructure that provides incentives for commuters to share rides with others. In addition, SCAG and its partners will strengthen their efforts to encourage ridesharing and other trip reducing strategies that aim to reduce vehicle trips, energy consumption, and air emissions. These efforts will include:

- Encourage local governments to require parking cash out programs, where feasible
- Encourage cities to reconsider minimum parking requirements in zoning ordinances
- Encourage the development and viability of Transportation Management Organizations/Agencies at major employment locations throughout the region
- Program public funds in the FTIP to educate employers and expand the Guaranteed Ride Home Program
- Provide seamless intra and inter-county carpool services to the regional traveler
- Encourage park-and-ride lots along suburban corridors, and in bedroom communities
- Identify current dedicated funding sources and work with county transportation commissions and partners on identifying additional new funding sources.
- Increase the number of commuter vanpools through more effective marketing and the provision of non-monetary public sector incentives.
- Expand the provision for vanpool services in the region by encouraging employers to offer incentives, and develop policies that encourage employers to provide such services.
- Maintain and sustain a regionally coordinated marketing strategy among the public and private sectors to enhance vanpool programs, increase ridership and improve outreach efforts.

TELECOMMUTING AND ALTERNATIVE WORK SCHEDULES

By using the data from the American Community Survey regarding teleworkers/worked from home and the World at Work Report and applying it to the SCAG region, we could estimate an average annual employment growth of 4.4 percent and an average annual telecommuting growth of 6.57 percent. Telecommuters of all types (full time, regular, occasional), as a percentage of all workers would more than double between 2008 and 2018, from approximately 350,000 workers to 747,000 workers, or 8.63 percent of all workers in the SCAG region.

Assuming that existing full-time telecommuters in the SCAG region in 2008 were approximately 2.6 percent of all workers, reaching 5 percent by 2020 is achievable, but ambitious. Applying the same growth percentages from the US Telecommuting Forecast to the SCAG region would estimate 4.2 percent of all workers telecommuting full time by 2016.

By implementing specific policies designed to promote telecommuting and reduce barriers, the percentage of full time equivalent (FTE) telecommuters can exceed 5 percent in 2020 and 10 percent in 2035.

These policies include:

- Support and encourage ubiquitous high speed internet access throughout the region
- Recommend changing taxation policies that might discourage working at home/telecommuting
- Promote how telecommuters can easily meet OSHA/ADA compliance via self-certification
- Encourage revising workforce safety/fair labor standards to better reflect working away from a central location
- Set a regional goal for average frequency of telecommuting to increase to 2 days per week in 2020 and 3 days/week in 2035.
- Set a regional goal that 50 percent of eligible workers adopt a flexible schedule (9/80, 4/10, etc.).

While alternative work schedules and telecommuting may reduce (or, in the case of satellite offices, reroute) commute trips in private vehicles, it may actually increase private vehicle travel for other trip purposes (such as errands and trips during the course of

work). Further, fragmentary evidence suggests that telecommuting may encourage people to live farther from their workplaces than they would otherwise. Telecommuters generate extra trips that might not normally be taken during the workday, such as errands, lunch trips, which can reduce the effectiveness of telecommuting somewhat (although not necessarily during peak congestion periods). It is assumed that these additional trips may be roughly 6 miles/day. SCAG estimates that 25 percent of total VMT saved through Telecommuting is lost through these extra trips.

ACTIVE TRANSPORTATION

SCAG is investing \$6.7 billion in bicycling and walking projects as part of the 2012 RTP.

SCAG is also proposing to develop a regional bicycle route system connecting all cities in the region, and expanding the existing system from 4,300 miles to over 10,000 miles. SCAG endorses increasing bicycle racks on regional buses from two to three, resulting in a 50 percent increase in carrying capacity. SCAG has also supported subsidizing folding bikes on transit buses. In addition, SCAG and Los Angeles County are studying the concept of mobility hubs at transit stations to extend the reach of transit. SCAG has collaborated with Orange County to examine greater active transportation linkages to transit centers.

Transportation System Management Strategies

The RTP identifies a comprehensive set of strategies that work in concert to optimize the operational performance of the transportation system. This set of strategies does not focus solely on expanding the system, but also considers how we operate the system; how we deal with incidents such as accidents or special events; and how we provide information to the traveling public so they can make informed decisions about how, where, and when to travel. All of these strategies are based on a foundation of comprehensive system monitoring so that we can understand how the transportation system is performing and where we need improvement. This approach is based in part on work that Caltrans has done for many years to optimize the performance of the state highway system.

Corridor System Management Plans

In 2006, California initiated the Corridor Mobility Improvement Account (CMIA) to improve the state highway system. CMIA program guidelines require the development of Corridor System Management Plans (CSMPs) for those projects receiving CMIA funding, to ensure that mobility improvements are maintained over time.

CSMPs provide a framework for long-term corridor management, with a focus on operational improvements. The intention of the CSMP effort is to continually monitor system performance and identify system improvements that are lower-cost, relatively quick to implement, and less capital-intensive than major corridor widening and expansion projects.

In the SCAG region, CSMPs were developed by Caltrans for I-5 (two segments) and I-405 in Los Angeles County; SR-57, SR-91, and SR-22/I-405/I-605 in Orange County; SR-91 and I-215 in Riverside County; I-10 and I-215 in San Bernardino County, and US-101 in Ventura County (Exhibit 1). SCAG contributed funding towards the I-405 CSMP in Los Angeles County, as well as towards the I-210 CSMP undertaken as part of the Governor's Go California initiative.

The CSMP development efforts began with a comprehensive assessment of corridor performance and the identification of congestion points called bottlenecks. This information was shared and verified with the stakeholders along the corridors. To address the bottlenecks, operational and minor capacity improvement projects were developed with input from stakeholders. These proposed improvements were analyzed using microsimulation models that were created specifically for the corridors. The potential improvements include intelligent transportation system (ITS) technologies, ramp metering, auxiliary lanes, ramp and interchange improvements, and incident management.

The results from these analyses, including recommended projects and assessment of project costs and benefits, are included in the corridor-level final reports provided at Caltrans' web page: www.dot.ca.gov/hq/tpp/corridor-mobility/index.html. The CSMP recommendations for new investments (above and beyond any current commitments identified in the Federal Transportation Improvement Program or countywide long range plans) total approximately \$840 million and are proposed for inclusion in the 2012 RTP.

Intelligent Transportation Systems

ITS projects are designed to increase transportation efficiency, but are also being used for safety, security and emergency response. Because the successful operation of ITS projects usually depends upon coordination and communication between different agencies and the systems they operate, it is essential that there be a region-wide "framework for cooperation" to help achieve that coordination and communication in the most cost-effective manner. This framework is the Southern California Regional ITS Architecture.

To monitor and manage the transportation system, Transportation Management Centers (TMCs) have been established in the four Caltrans Districts (7, 8, 11, and 12) serving the entire region. In addition, the City of Los Angeles maintains the Automated Traffic Surveillance and Control (ATSAC) system, and many cities have developed their own TMCs.

Currently, over 800 centerline miles of freeway system in the urbanized portion of the SCAG region have full traffic detection capabilities, and coverage with over 300 video cameras. Additionally, the local arterial ITS infrastructure is supported by over 15,000 detection devices, and hundreds of video cameras, providing for optimized signal synchronization and traffic flow in response to conditions throughout the day (it is anticipated that Los Angeles County will have all primary arterials synchronized by 2020). Local arterials are also being equipped with a growing number of the changeable message signs at critical locations such as major arterial and special event centers to provide real time motorist information to improve traffic management.

Non-Recurring Congestion

SCAG recognizes non-recurring congestion as a major issue in the Region. In 2009, the estimated average percentage of congestion that was due to accidents or other incidents was around 45 percent. SCAG estimates lost capacity in the AM Peak Period, attributable largely to non-recurring incidents such as accidents, weather conditions, stalled vehicles, etc., could have the effect of the loss of approximately 286 lane miles of freeway capacity when it is needed the most. The cost of physically adding this lost capacity by expanding existing roadways would exceed \$4 billion.

In order to address the non-recurring congestion in a more coordinated and concerted effort over a long haul, SCAG has introduced a new performance metrics that will track

delay on our highways due to non-recurring congestion over time. This is also described in the Performance Measures report associated with the 2012 RTP/SCS. While SCAG does not have the jurisdiction nor the authority over first responders to highway incidents, SCAG recommends these agencies to develop and/or publicize existing performance measures for reducing the average response and clearance times for incidents.

From an operational standpoint, if an incident, such as a collision, occurs on the Region's freeways, it is detected by the surveillance equipment/sensors, and the Transportation Management Centers initiate a response as quickly as possible. Each County maintains a fleet of Freeway Service Patrol vehicles, partially funded by the State, to respond to incidents and restore free flow conditions. Notices of collisions are relayed to freeway message signs, mobile traffic maps and local media to notify motorists so they can take alternate routes or modes.

The region is also prepared for nature caused non-recurring congestion, such as mud slides. As a precautionary measure, Caltrans has installed fencing along cliff faces along SR-14 to reduce rock slides landing on the roadway. Barriers are in place along PCH for mud slides, and barriers are placed where recent wildfires may cause mud slides, such as in La Canada-Flintridge. Each Caltrans district has a plan in case of freeway closures within their district.

With the preponderance of entertainment functions, including sporting events, and film/television/recording events, standard procedures exist to reduce congestion. As an example, during the summer season of the Hollywood Bowl, buses are provided at key park and ride locations throughout LA County to provide access to the events. Disneyland has dedicated carpool access directly from the freeway. Metrolink provides service to Angel Stadium in Anaheim.

Traveler Information Services

Through a variety of public and private information service providers, most of the current real time traffic detection freeway and HOV system speeds, California Highway Patrol incident data, changeable message signs and transit information are available to travelers on the internet, handheld computers, pagers, and other portable communications devices. The regional 5-1-1 system has been released to the public, providing information on regional congestion for trip planning as well as trip planning via Metro transit system.

Research completed for SCAG in 2002 by the Volpe National Laboratory indicates a high propensity of traveler information users to shift departure time, reduce or eliminate trips, and shift mode in response to real time congestion information.

Much of this real-time traffic information is being archived as part of the Regional Integration of ITS systems by Los Angeles County Metropolitan Transportation Authority. The data will be used by transportation planning agencies throughout the region.

Including improvements proposed in the CSMPs, the RTP includes \$6.7 billion for Transportation System Management improvements, including extensive advanced ramp metering, enhanced incident management, bottleneck removal to improve flow (e.g. auxiliary lanes), the expansion of the integration of our traffic signal synchronization network, and data collection to monitor system performance. The efficiencies generated by these improvements are equivalent to increasing available freeway capacity by 5 percent.

Land-Use Strategies

The Baseline Growth Forecast in the 2012 RTP ties housing to transportation planning, considering both needs simultaneously. SCAG undertook a regional growth forecast effort to provide the foundation for the 2012 RTP/SCS and the Regional Housing Needs Assessment for the next housing element cycle. Forecasts for the 2020 and 2035 planning years were developed through a bottom up approach, wherein SCAG staff worked with local jurisdictions to attain the most up to date data.

This approach ensures that the resulting assumptions are consistent with planned transportation infrastructure. The Baseline Growth Forecast provides the basis for developing the land use assumptions at the regional and small-area levels which build the 2012 RTP Plan Alternative.

SCAG has undertaken several projects and programs that are coordinated to the development of the RTP/SCS. Compass Blueprint Planning Services are provided through demonstration projects. These projects enable cities and counties to better evaluate planning options and stimulate sustainable development opportunities. The program is focused on reducing regional VMT and GHG emissions, while providing the co-benefits of community livability, mobility, prosperity and sustainability.

The changes in land use patterns around our transit investments, referred to as transit oriented development (TOD), illustrate the trends of decreased auto trips and reduced

vehicles miles traveled (VMT) through greater transit use, increased substitution of walk trips, and improved access to local jobs and services.

SB375 contains CEQA incentives to encourage coordinated land use and transportation planning. Certain types of development projects (transit priority projects or residential/mixed use projects) may qualify for CEQA relief as long as the basic criteria are met, which means the project is determined to be consistent with an approved SCS.

Transit

Public transit has grown in recent years to become an increasingly integral mode of transportation for the movement of people to and from jobs, school, and shopping, cultural, and recreational activities. The SCAG region has one of the most extensive transit systems in the United States.

Key points considered in developing recommendations to expand our transit system include:

- Significant investments in transit already committed locally (CTCs)
- Changing demographics and urban forms call for more travel choices, particularly transit
- Transit can significantly relieve pressure on some of our most congested roadways
- Additional transit will be necessary to ensure our pricing strategies work efficiently and equitably

RECOMMENDATIONS

Significant investment in transit is already committed locally, primarily based on local sales tax measures as reflected in the current RTP. Some of the illustrative projects backed by current commitments are:

- Purple Line Extension to Westwood
- Gold Line Extension to Glendora
- Metrolink San Jacinto and Temecula Extensions
- High frequency Metrolink service from Laguna Niguel to LA
- Rail feeder service in Orange County

- Anaheim Rapid Connector
- New BRT services in Orange County
- Redlands Rail
- E Street Corridor

In addition to current commitments, SCAG recommends the following transit strategies:

- Increase service in productive corridors
- New Point-to-Point Express bus service in key corridors
- New Bus Rapid Transit (BRT)/limited-stop service in key corridors

SCAG is also proposing significant improvements to the Los Angeles-San Diego-San Luis Obispo Rail Corridor (LOSSAN) as well as the Metrolink system to achieve higher speed operations on these services in the interim, acting as an initial phase of the ultimate high speed rail system for the 2012 financially constrained plan.

All of these investments to expand and enhance our transit system will play a key role in managing regional congestion on our roadway system.

POTENTIAL BENEFITS

Some of the benefits of greater transit investments are:

- New and enhanced transit services that provide new choices for commuters and residents
- Cleaner air and reduced congestion, VMTs and GHGs
- Facilitation of current and future smart growth and sustainable communities
- The ability for our residents to choose a healthier, more active lifestyle
- The ability for our residents who do not own a vehicle to remain mobile and active

Goods Movement

The SCAG region is the largest international trade gateway in the U.S., supported by marine ports, air cargo facilities, railroads, regional highways and state routes. In 2010, the LA Customs District (which includes the ports of Los Angeles, Long Beach, Hueneme, and Los Angeles International Airport) handled \$336 billion of maritime cargo and \$78

billion in air cargo. In the same year, \$10.4 billion of trade passed through Imperial County Ports of Entries (POEs).

SCAG embarked on a regional goods movement study to address key system deficiencies and gaps. The 2012 RTP includes goods movement projects jointly developed with the regional stakeholders, including strategic regional initiatives such as an East-West Freight Corridor that would connect to the I-710 freight corridor and provide access to warehousing and manufacturing facilities further inland to the I-15.

This freight corridor concept represents an environmental mitigation and mobility enhancement strategy. While numerous east-west alignments were examined, the 2012 RTP recommendation includes a corridor concept adjacent to the SR-60 and the Union Pacific Railroad alignment. This corridor was identified as the most viable option due to a number of key factors including congestion reduction, travel time savings, least property impacts, air quality benefits, and economic/job creation benefits. This option continues to be reviewed with community stakeholders.

In addition, supplemental goods movement system strategies include targeted bottleneck relief initiatives along with a regional rail package comprising mainline rail capacity expansion, intermodal facility capacity improvements, port area rail improvements as well as critical grade separation projects throughout the region. In addition to congestion relief, these investments in system efficiencies would reduce environmental impacts with aggressive commercialization of zero-emission trucks and supporting research, development and demonstration to realize our long-term objective of a zero-emission rail system.

POTENTIAL BENEFITS

The following are some of the benefits from the proposed recommendation:

- Supports mobility for key industries,
- Serves goods movement markets in an efficient manner
- Helps alleviate the region's congestion
- Promotes job creation and retention
- Improves safety (reduced truck/automobile accidents and eliminates 69 at-grade railroad crossings)
- Reduces emissions (CO₂, NO_x and PM_{2.5})

The FTIP

All federally funded congestion relief strategies (projects and programs) are programmed into the Federal Transportation Improvement Program (FTIP) in the SCAG region. Under state law, the CMP projects must be incorporated into the FTIP in order to receive federal and state funds. Under federal law, the FTIP must be updated every two years for funding.

In non-attainment and maintenance areas, the FTIP projects as a whole, including congestion relief projects, must be analyzed for the Transportation Conformity requirements. In project-level analysis, the projects requiring federal action (funding or approval) are subject to environmental impact study (EIS) through the National Environmental Policy Act (NEPA). This is an evaluation and analysis of the alternatives. The selected alternative will be incorporated into the FTIP for implementation.

The federal government regulates the monitoring of projects that significantly increase SOV capacity in the region through 23 CFR§450.320 subsections d and e, which states, in part:

(d) In a TMA designated as non attainment area for ozone or carbon monoxide pursuant to the Clean Air Act, Federal funds may not be programmed for any project that will result in a significant increase in the carrying capacity for SOVs (i.e., a new general purpose highway on a new location or adding general purpose lanes, with the exception of safety improvements or the elimination of bottlenecks), unless the project is addressed through a congestion management process meeting the requirements of this section.

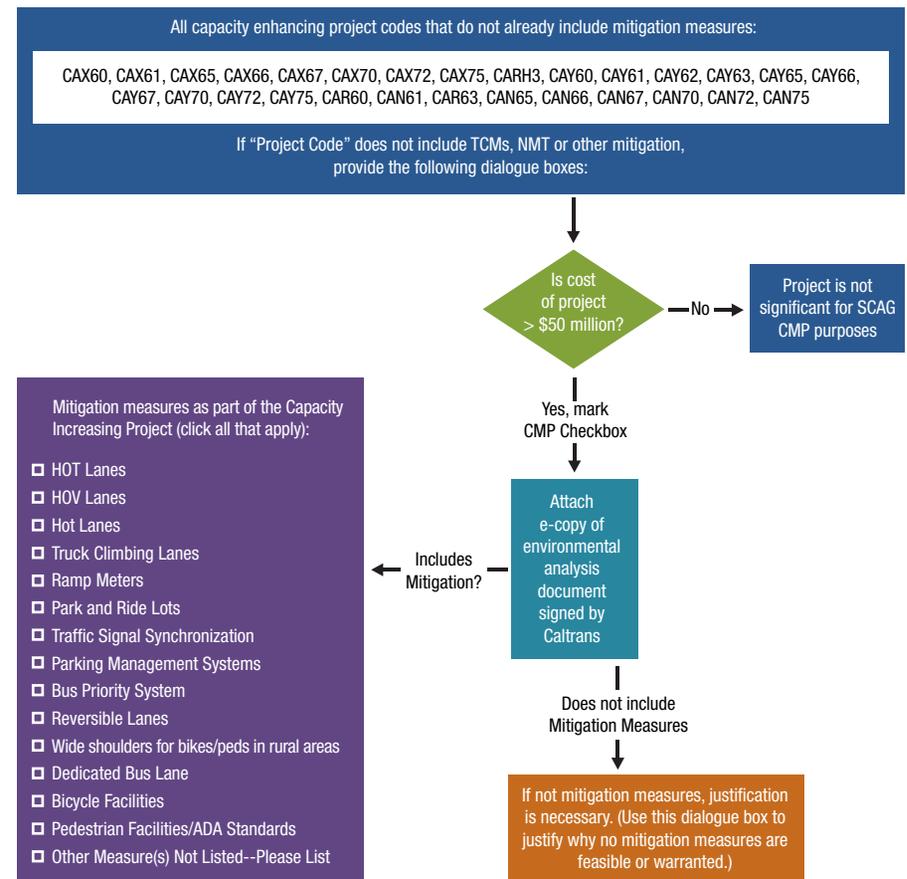
(e) In TMAs designated as non attainment for ozone or carbon monoxide, the congestion management process shall provide an appropriate analysis of reasonable (including multimodal) travel demand reduction and operational management strategies for the corridor in which a project that will result in a significant increase in capacity for SOVs (as described in paragraph (d) of this section) is proposed to be advanced with Federal funds.

... All identified reasonable travel demand reduction and operational management strategies shall be incorporated into the SOV project or committed to by the State and MPO for implementation.

MONITORING PROJECTS FOR COMPLIANCE WITH CMP

SCAG has established \$50 million as the threshold by which a SOV capacity increasing project is considered significant. The threshold is based on construction costs in California. When a county submits their projects into the FTIP database, the program flags if the project is capacity increasing and if the costs are greater than \$50 million. If the project meets both criteria, the submitter must then identify documentation where appropriate operation and management strategies are identified, as well as supporting documentation that led to identifying the SOV project as the preferred alternative. The planning documentation should indicate the project was planned consistent with the congestion management process.

FIGURE 2 CMP Incorporation into FTIP



CMP TOOLBOX

The SCAG CMP Toolbox on the following pages contains strategies, summarizes potential costs and benefits, and potential lists performance measures/metrics. The Toolbox contains both TDM strategies and TSM strategies. In addition, complementary strategies are listed that may increase the effectiveness of various strategies.

CMP Toolbox – Carpooling/Vanpooling

TDM – Carpooling presents the most cost effective way to decrease congestion by using the available seat(s) capacity in vehicles.

Carpooling – An arrangement where several participants travel together in one vehicle, often sharing costs or taking turns as the driver. Can be formalized with dedicated vanpools.

Pros:

- Reduces costs to participants
- Reduces single occupancy vehicles on roadways during peak periods.
- Reduces amount of pollution released.
- Can reduce travel time

Cons:

- Requires punctuality
- Reduces ability to run errands.
- Only suitable for prescheduled trips, such as commuting

How do you measure this? *Average Vehicle Occupancy (AVO):* Can be performed through visual counts on roadways, employer surveys (some surveys done annually by South Coast Air Quality Management District).

Examples of quantifiable performance goal (measured by Average Vehicle Occupancy (AVO):

- AVO >1.5 (example)

- Average travel speed
- Increase carpooling by XX% over base year by the year 20XX

Implementation costs:

- Promotion and monitoring
- Necessary complementary strategies can add costs

Congestion impacts:

- Directly impacts congestion on a 1:1 basis

Complementary Strategies:

- Carpool subsidies
- Ride matching services
- Guaranteed ride home program
- Carpool matching software
- Preferential parking
- Parking cash out

- Carpool exemption for ramp meters
- HOV lanes
- Toll road exemptions for vanpools
- Trip reduction ordinances
- Congestion pricing/parking pricing strategies
- Park and ride facilities

Responsible agency(s): Employers, transportation management agencies, county transportation authorities, cities, air management districts

Primary stakeholders:

- Employers
- Transportation management agencies/organizations
- Carpooling/ridesharing organizations

Secondary stakeholders

- News media
- Law enforcement (HOV lane violations)
- Parking lot owners/operators

Sources: Carpool Ride Matching Service; <http://www.carpoolconnect.com/>
 TDM Encyclopedia; <http://vtpi.org/tdm/tdm34.htm>
 Sustainable Environment for Quality of Life; <http://www.seql.org/Carpool%20Vanpool.pdf>

Environmental Protection Agency Carpool Incentive Programs:
 Implementing Commuter Benefits Under the Commuter Choice Leadership Initiative

CMP Toolbox – Parking Cash Out

TDM – Employer: Free parking subsidizes the cost of driving. By separating the cost of parking from a business, travelers have incentives to use other modes.

Parking Cash Out – An employer-funded program under which an employer offers to provide a cash allowance to an employee equivalent to the parking subsidy that the employer would otherwise pay to provide the employee with a parking space.

Pros:

- Reduces costs for employer
- Provides “extra” money for employee
- Can provide more area for development/business use if business owns parking lot/structure

Cons:

- Other modes of transportation must be available in order for it to be effective
- Works best when employer leases parking lot (vs. owning lot)
- Excessive parking infrastructure already in place

How do you measure this? Surveys of businesses or business areas

Examples of quantifiable performance goal: Reduce the number of cars parking in area A during normal employment hours by XX percent from the base year.

- Change in % emp using other modes (by) to % emp using other modes (current year).

Implementation costs:

- Minor costs to have payroll system accounts reflect parking cash out program and any tax benefits
- Necessary complementary strategies can add costs

Congestion impacts:

Santa Monica reported a 17% reduction in parking and a 7% reduction in SOV travel (1998).

Complementary strategies:

Transit subsidies, carpool subsidies, carpool preferred parking; bicycle racks/lockers

Responsible agency(s): Employers

Primary stakeholders:

- Employers
- Transportation management organizations/associations
- Cities

Local case study:

- California AB2109 requires employers of 50 or more employees who lease their parking to offer parking cash out.
- Santa Monica requires parking cash out under Ordinance 1604 requires employers eligible under AB2109 to implement a parking cash out program.

Sources: California Air Resources Board Parking Cash Out Incentives: Eight Case Studies 1998
 US Environmental Protection Agency Parking Cash Out: Implementing Commuter Benefits as One of the Nation’s Best Workplaces for Commuters 2005.

CMP Toolbox – Parking Management

TDM – The cost/availability of free parking is the second greatest influence on travel behavior behind the cost of gasoline.

Parking Management – The systemic influencing transportation mode choices in a particular area by limiting the availability of parking, either through the reduction of available parking, or by increasing the costs of parking.

Pros:

- Reduced congestion
- Increased air quality

Cons:

- Imposing fees on what has traditionally seen as free to consumer may be politically unpopular
- Needs range of transportation options available (bus, subway, rail)

How do you measure this? Change in transit ridership to area; change in number of carpoolers; change in bicycle parking utilization

Examples of quantifiable performance goal: Reduce the number of Single Occupancy Vehicles in the downtown area by XX% from the base year by 20XX.

- Average parking lot utilization
- Percentage of SOV parking utilization

Implementation costs:

- HOV/vanpool parking signs (\$500/ea)
- Electronic parking availability signage

Congestion impacts:

- Can reduce congestion caused by drivers looking for free street parking.

Complementary strategies:

- Intelligent parking management systems
- Intelligent parking meters
- Parking cash out
- Increased parking fees

- Reduced parking fees/preferential parking for carpools/vanpools
- Reduced parking requirements
- Shared parking across buildings

Responsible agency(s): Employers, parking lot owners/operators

Primary stakeholders:

- City government
- County government
- TMAs/TMOs

- Parking management companies
- Building owners/management

Sources: <http://www.ops.fhwa.dot.gov/publications/fhwahop10010/presentation.htm>
 Traffic Incident Management Handbook; http://ntl.bts.gov/lib/jpodocs/rept_mis/13286.pdf

CMP Toolbox – Pedestrian Improvements

TDM: Pedestrian Infrastructure Investments – Developing pedestrian facilities to reduce motorized vehicle use for short (<1/2 mile) utilitarian/school trips and linkages to transit..

Pros:

- Reduced congestion
- Reduced emissions
- Reduced capital expenditures
- Regional health

Cons:

- May not be effective for some communities
- Some older non-standard roadways may require sidewalk widening or innovative solutions to be effective

How do you measure this?

Pedestrian level of service criteria: Qualitative criteria to determine how desirable an area is for walking, including sidewalk width, ADA compliance, safety, street life, social amenities, senior citizen comfort.

Walk score: An internet tool that gives a score based on the number and type of amenities within a distance from a specified address.

Surveys of mode share: American Community Survey, National Household Travel Survey

Examples of quantifiable performance goal: Increase pedestrian Level of Service criteria for a given street or area to LOS X by 20XX

- | | |
|--|---|
| <ul style="list-style-type: none"> ▪ Number of pedestrians on a given street ▪ Ease and safety for street crossings ▪ Condition of sidewalks ▪ ADA compliance ▪ Pedestrian Level of Service standards | <ul style="list-style-type: none"> ▪ Criteria for pedestrian friendly streets: <ul style="list-style-type: none"> – Width of sidewalk – Amenities (shops, restaurants, sidewalk cafes) – Shade trees – Barriers between sidewalk and travel lanes |
|--|---|

Implementation costs:

- Sidewalk repair/ADA compliance \$300–\$500/sq. ft.

Congestion impacts:

- Changing traffic signals to emphasize pedestrian safety could slightly impact motorist convenience.

Complementary strategies:

- | | |
|---|---|
| <ul style="list-style-type: none"> ▪ Transit station improvements ▪ Sidewalk improvements ▪ Safe routes to school strategies ▪ ADA compliance | <ul style="list-style-type: none"> ▪ Transit oriented development ▪ Traffic signal improvements ▪ Transit service ▪ Complete streets policies |
|---|---|

Responsible agency(s): Caltrans (state highways), counties, cities

Primary stakeholders:

- | | |
|---|--|
| <ul style="list-style-type: none"> ▪ Caltrans ▪ Counties ▪ Cities ▪ Public works ▪ Engineering | <ul style="list-style-type: none"> ▪ ITS (traffic signals) ▪ Safe Routes to School coalitions ▪ California Walks ▪ Bus Riders Union ▪ American Association of Retired Persons |
|---|--|

CMP Toolbox – Motor Vehicle Restriction Zones

TDM: Motor vehicle restriction zones limit motor vehicles at a certain place, either temporarily or permanently. Most vehicle restrictions are implemented by local or regional governments, often as part of a downtown revitalization program or neighborhood traffic management plan, or during a period of exceptional traffic congestion or pollution. Cyclovia is an example of this, where massive street closures are performed in Bogota, Colombia weekly, and less frequently in other countries. Permanent examples include the 3rd Street Promenade in Santa Monica and the Grove in Hollywood.

Pros:

- Enables other modes of transportation in the affected areas
- Deferred vehicle trips (if temporary)

Cons:

- Potential motorist and business opposition
- When effective, can reduce traffic congestion, road and parking facility costs, crash risk, pollution emissions and local environment impacts

How do you measure this?

Use of alternate modes in corridor around vehicle restriction zone; change in LOS after permanent implementation

Examples of quantifiable performance goal: Increase pedestrian usage on street by XXX%

Implementation costs:

- Temporary – variable costs for set up, security and tear down
- Permanent – cost of bollards/barriers

Congestion impacts:

- Can temporarily increase congestion until confusion is resolved.

Complementary strategies:

- Bicycle racks
- Pedestrian improvements
- Increased bike facilities to/from zone
- Increased transit service to area

Responsible agency(s): Local cities

Primary stakeholders:

- Local cities
- Local businesses
- Transit agencies

Examples: Pedestrian malls (3rd Street Promenade, The Grove, Downtown Disney)

Sources: Examples of Ciclovía type events (Cyclavia, <http://ciclavia.wordpress.com/about/>)
 Ciclovía, Bogota, Columbia; <http://streetwiki.wikispaces.com/Ciclovía>; <http://en.wikipedia.org/wiki/Ciclovía>
 Pedestrian Malls: Santa Monica Promenade; http://en.wikipedia.org/wiki/Third_Street_Promenade
 Riverside Main Street Pedestrian Mall; <http://www.riversideca.gov/shop/retail-centers.asp>

CMP Toolbox – Safe Routes to School Programs

TDM: Parents dropping off children at school represents a significant level of morning local congestion (10–15%). Increasing the number of students walking or bicycling can reduce local congestion.

Safe Routes to School: The use of resources to encourage children not to be driven to school, including bike/ped infrastructure improvement, education, encouragement and enforcement.

Pros:

- Reduced congestion during peak periods
- Increased safety for students
- Increased health/fitness

Cons:

- Can require considerable involvement from parents, teachers and law enforcement for some programs

How do you measure this? Change in congestion around schools; change in number of students walking or bicycling to school

Examples of quantifiable performance goal: Increase the number of students biking or walking to school by XX% over the base year (age and distance appropriate).

- Number of students biking or walking
- Reduction in accidents around school
- Reduction in student fatalities/injuries
- Before/after studies with education programs

Implementation costs:

- Funded through Federal and State grants specific to Safe Routes to School

Congestion impacts:

- Can reduce morning trip chaining, resulting in lower congestion.

Complementary strategies:

- Sidewalk improvements
- Bicycle infrastructure and parking
- ADA compliance

- Traffic signal upgrades
- Traffic calming

Responsible agency(s): Caltrans, cities, school districts

Primary stakeholders:

- Students
- Law enforcement
- City planning/engineering
- School administration
- Bicycle education organizations (CICLE, League of American Bicyclists)
- Parents
- Teachers
- Residents/businesses around school locations
- Parent, Teachers Association (PTA)

Sources: National Center for Safe Routes to School
 Caltrans Local Assistance: Safe Routes to School Program
 Case Studies; http://katana.hsrb.unc.edu/cms/downloads/srts_case_studies.pdf

CMP Toolbox – Bicycle Infrastructure Improvements

TDM: Bicycling can reduce vehicle trips for short distances (most trips are less than three miles distance) where vehicle pollution control devices are least effective..

Bicycle and Pedestrian Infrastructure Investments: Developing bicycle facilities to reduce motorized vehicle use for both short (<5 miles) utilitarian/school trips, linkages to transit, medium (<10 miles) commute trips and for longer recreational/touring trips.

Pros:

- Reduced congestion
- Reduced emissions
- Reduced capital expenditures
- Regional health

Cons:

- May not be effective for longer commutes
- Some roadways may require widening or innovative solutions to be effective

How do you measure this?

Bicycle Mode Share: Bicycle counts and surveys on regular schedule. This can be done through manual counts, or through ITS technologies to automatically count bicyclists.

Examples of quantifiable performance goal: Increase Bicycle Mode Share to X% of all daily commutes by the year 20XX; reduce bicycle fatalities by at least XX% by 20XX

- | | |
|---|--|
| <ul style="list-style-type: none"> ▪ Miles of bicycle facilities as a percentage of roadway miles ▪ Increase in number of bicyclists by gender over baseline year | <ul style="list-style-type: none"> ▪ Reduction in bicyclist fatalities ▪ Bicycle facility connectivity (gap closures, connecting cities, regional corridors) |
|---|--|

Implementation costs:

- Bike lane \$5,000–\$50,000/mile
- Bike path \$600,000–\$2+ million/mile
- Signage \$500–\$2,000/mile

Congestion impacts:

- Can result in lower speeds on some roads, which could result in increased congestion during peak periods

Complementary strategies:

- Increased bicycle parking
- Wayfinding signage
- Safe Routes to School plans

- Compass Blueprint strategies
- Bicycle-Transit integration

Responsible agency(s): Caltrans, county transportation authorities, cities

Primary stakeholders:

- | | |
|---|--|
| <ul style="list-style-type: none"> ▪ Cities ▪ Counties ▪ Local bicycle advocates ▪ MPOs | <ul style="list-style-type: none"> ▪ State DOTs ▪ Transit agencies ▪ Rail organizations (for Rails to Trails) ▪ Utility companies (power line corridors) |
|---|--|

Sources: US DOT Policy Statement Integrating Bicycling and Walking into Transportation Infrastructure
 Transportation Research Board Transportation Research Record 1538 2007
 National Cooperative Highway Research Program (NCHRP) Report 552: Guidelines for Analysis of Investments in Bicycle Facilities

CMP Toolbox – Bicycle Transit Integration

TDM: Bicycling, combined with transit, increases the effective range of transit users. This First Mile/Last Mile solution.

Pros:

- Increases first mile/last mile connectivity from .5 miles to 1–5 miles

Cons:

- More effective for longer distances that normally wouldn't be traveled by bicycle alone

How do you measure this? Average number of bicyclists on buses, trains, or routes/day, traveler O/D surveys.

Examples of quantifiable performance goal: Increase percent of bicyclists as a percentage of all riders

Implementation costs:

- Bus racks (\$500–\$1,000 installed)
- Dedicated spaces on rail (\$500–\$5,000 installed)

Congestion impacts:

- Reduced vehicles on roadways, particularly during peak periods
- Increased transit ridership

Complementary strategies:

- | | |
|--|---|
| <ul style="list-style-type: none"> ▪ Folding Bikes on Transit program ▪ Secured bicycle parking at employment centers ▪ Bike lanes, paths and designated routes ▪ Bicycle racks on buses | <ul style="list-style-type: none"> ▪ Secure bicycle lockers at major transit stations ▪ Dedicated, safe bicycle storage on light/heavy rail cars ▪ Bike share ▪ Bike stations |
|--|---|

Responsible agency(s): Transit agencies, Metrolink

Primary stakeholders:

- Transit agencies

Sources: Example, Portland Oregon; <http://www.portlandonline.com/transportation/index.dfm?a=70399&c=36638>
<http://www.trimet.org/howtoride/bikes/index.htm>
 Caltrain; http://www.transitunlimited.org/Caltrain_bicycle_access

CMP Toolbox – Alternative Work Schedules

TDM: Alternative Work Schedules can reduce the number of vehicles during peak periods. Key strategies include flexible work schedules, staggered shifts, and compressed work weeks.

Flextime: Employees are allowed some flexibility in their daily work schedules. For example, rather than all employees working 8:00 to 4:30, some might work 7:30 to 4:00, and others 9:00 to 5:30.

Staggered shifts: Shifts are staggered to reduce the number of employees arriving and leaving a work site at one time. Some shifts may be 8:00 to 4:30, others 8:30 to 5:00, and others 9:00 to 5:30. Similar effect on traffic as flextime, but does not give individual employees as much control over their schedule.

Compressed workweek (CWW): Employees work fewer, but longer days; such as four 10-hour days each week (4/40) or 9-hour days with one day off every two weeks (9/80). Assembly Bill 5 (2009, 2nd ex. Session) provided greater flexibility to employers regarding overtime.

Pros:

- Decrease peak period VMT
- Improved travel time for participants

Cons:

- Minor employer costs to manage
- May not work universally

How do you measure this?

Number of participants, as collected by AQMD or local government through reporting or surveying; American Community Survey, National Household Travel Survey.

Examples of quantifiable performance goal: Increase percentage of participants among eligible employers by 20XX

- % Participation from base year to current year by type of schedule

Implementation costs:

- Management and reporting
- Factors unique to the organization

Congestion impacts:

- Reduced peak period VMT
- Improved travel time for participants

Complementary strategies:

- Telecommuting
- Commute trip reduction programs

- Parking management strategies
- Congestion pricing strategies

Responsible agency(s): Employers

Primary stakeholders:

- Employers
- TMOs (where applicable)
- Cities (reporting)
- AQMD (reporting)

Sources: US Office of Personnel Management – Handbook on Alternative Work Schedules; <http://www2.opm.gov/flsa/oca/aws/INDEX.asp>
 Victoria Transportation Policy Institute, TDM Encyclopedia – Alternative Work Schedules; <http://www.vtppi.org/tdm/tdm15.htm>

CMP Toolbox – Telecommuting

TDM: *Telecommuting is where an employee uses telecommunication from home, rather than a central office, either every day or certain days of the week.*

Pros:

- Reduced VMT during peak periods
- Reduced VMT overall

Cons:

- Only effective for certain industry types, such as white collar

How do you measure this? Number of participants, as collected by AQMD or local government through reporting or surveying.

Examples of quantifiable performance goal: Increase percentage of participants among eligible employers by 20XX

- Number of pedestrians on a given street
- Ease and safety for street crossings
- Criteria for pedestrian friendly streets
 - Width of side

Implementation costs:

- Initial costs, such as remote computer
- Second and succeeding year costs tend to decline

Congestion impacts:

- Reduced vehicles on roadways, particularly during peak periods

Complementary strategies:

- Congestion pricing
- Increased parking fees
- Satellite offices

Responsible agency(s): Employers

Primary stakeholders:

- Employers

Sources: Transportation Policy Institute, TDM Encyclopedia Telecommuting; <http://www.vtpi.org/tdm/tdm43.htm>

CMP Toolbox – Emergency Ride Home Program

TDM: The *Emergency Ride Home Program* is a complementary strategy that provides employees who carpool, vanpool, or take transit a guaranteed free ride home in the event of a family emergency and the employee must leave immediately.

Pros:

- Increases desirability of carpooling, vanpooling and transit

Cons:

- Has potential to be costly without employer set limits

How do you measure this? Complementary Strategy Use measurements for transit, carpooling, and vanpooling strategies

Examples of quantifiable performance goal: N/A, see Carpool, Vanpool, or Transit subsidy tools

Covered Emergencies:

- Personal illness
- Illness, death of family member
- Unscheduled overtime (carpool/vanpool only)

Not Covered:

- Personal errands
- Scheduled medical appointments
- Scheduled overtime
- Natural disasters where the entire workforce is dismissed

Implementation costs:

- Variable incident related costs

Congestion impacts:

- Assists other programs to reduce congestion

Complementary strategies:

- Transit subsidies
- Carpool incentives
- Vanpool incentives

Responsible agency(s): Employers

Primary stakeholders:

- Employers
- Employee
- Taxi service

CMP Toolbox – Congestion Pricing

TDM: *Congestion Pricing* is the charging fees for a vehicle to access certain high congestion areas, either during peak periods or permanently.

Pros:

- Targeted relief
- Funds can be used to improve local area

Cons:

- Costs to set up can be high
- Opposition

How do you measure this? AADT on local streets

Examples of quantifiable performance goal: Reduce AADT on key streets by XX%

Implementation costs:

- ITS infrastructure to monitor, charge fees, and enforce violations

Congestion impacts:

- Targeted reduced congestion, such as in London

Complementary strategies:

- Increased transit service
- Free local shuttle/Dash service
- Car free streets
- Bike share

Responsible agency(s): Cities

Primary stakeholders:

- City ITS department
- City police
- Transit agencies

CMP Toolbox – High Occupancy Vehicle (HOV) Lanes

TDM: *Dedicated HOV Lanes provide an incentive to carpool/vanpool/transit by reducing travel times for those allowed in the lane during congested periods.*

An HOV lane is a dedicated lane(s) along a freeway or arterial dedicated to vehicles with more than one or two occupants. Increases corridor capacity while at the same time provides an incentive for single-occupied drivers to rideshare. On average, a HOV lane in Los Angeles County accommodates 1,300 vehicles or 3,300 people per hour during peak periods, and the county HOV system serves approximately 331,000 vehicle trips or 780,000 person trips per day.

Pros:

- Reduces single occupancy vehicles on roadways during peak periods
- Reduces amount of pollution released
- Can reduce travel time

Cons:

- Can be expensive to retrofit without removing any general purpose lanes
- Can create congestion at access points

How do you measure this? Average vehicle occupancy (AVO): average daily traffic in carpool lanes

Examples of quantifiable performance goal: Measured by Average Vehicle Occupancy (AVO); increase carpooling by XX% over base year by the year 20XX

- AVO <1.5 (example)
- Average travel speed

Implementation costs:

- Capital costs
- Right of way costs

Congestion impacts:

- Can significantly reduce congestion

Complementary strategies:

- | | |
|--|--|
| <ul style="list-style-type: none"> ▪ Carpool subsidies ▪ Ride matching services ▪ Guaranteed ride home program ▪ Carpool matching software ▪ Preferential parking ▪ Parking cash out | <ul style="list-style-type: none"> ▪ Carpool/bus lanes on arterials ▪ Carpool exemption for ramp meters ▪ Toll road exemptions for carpools ▪ Trip reduction ordinances ▪ Congestion pricing/parking pricing strategies ▪ Park and ride facilities |
|--|--|

Responsible agency(s): State Department of Transportation, county transportation commissions, MPOs, cities

Primary stakeholders:

- Caltrans
- MPOs
- County transportation commissions
- Cities

Secondary stakeholders:

- Law enforcement (HOV lane violations)
- Traffic news media
- Carpooling/ridesharing organizations

Source: Caltrans District 7, "2008 HOV Annual Report – Executive Summary," January 2009

CMP Toolbox – Traffic Incident Management

TDM: Incidents (crashes, special events, weather, and other causes) represent over 20 percent of all congestion. Reducing the response and clearance times can reduce overall congestion.

Traffic incident management: The systematic use of resources to reduce the duration and impacts of accidents, special events, severe weather, and other causes, and to improve the safety of motorists, crash victims, and first responders.

Pros:

- Improved safety (reduced secondary accidents, responder safety)
- Reduced emissions
- Emergency preparation
- Reduced capital expenditures

Cons:

- Measuring the effectiveness of the program over time will require high-level support and buy-in from leadership within participating agencies
- Quest for improving time should not come at expense of safety

How do you measure this?

Roadway clearance time: The time between first recordable awareness of an incident (detection/notification/verification) by a responsible agency and first confirmation that all lanes are available for traffic flow.

Incident clearance time: The time between the first recordable awareness and the time at which the last responder has left the scene.

Examples of quantifiable performance goal: Reduction in incident duration for each incident evaluation period (by type of accident)

- <1/2 hr (XX% reduction)
- >1/2 & <1 hr (XX% reduction)
- 1 hr & <2 hrs (XX% reduction)
- >2 hrs (XX% reduction)

Implementation costs:

- Cost of positioning tow trucks and other material
- Administrative costs of reporting

Congestion impacts:

- While not reducing VMT, can reduce congestion

Complementary strategies:

- Transportation management centers
- Regional 5-1-1 system

- Changeable message sign

Responsible agency(s): Caltrans, county transportation authorities, cities

Primary stakeholders:

- Law enforcement
- Fire and rescue emergency medical services
- Transportation agencies
- Towing and recovery
- Emergency managers
- Hazardous materials responders
- Medical examiners and/or coroners
- Elected and appointment officials
- Traffic media
- Highway users

Source: http://www.ops.fhwa.dot.gov/publications/fhwahop_10010/presentation.htm
Traffic Incident Management Handbook; http://ntl.bts.gov/lib/ipodocs/rept_mis/13286.pdf

CMP Toolbox – Ramp Metering

TDM: *Ramp Metering reduces freeway congestion by limiting the rate at which vehicles enter the freeway.*

Pros:

- Reduces the number of cars entering the freeway at one time, reducing congestion, weaving, etc.

Cons:

- Creates localized surface street congestion for benefit of reduced travel time for longer distances.

How do you measure this? Average travel delay, average freeway speed

Examples of quantifiable performance goal:

- Increase average freeway speeds
- Reduce average travel delay

Implementation costs:

- Can be significant depending on level of sophistication

Congestion impacts:

- Reduced vehicles on roadways, particularly during peak periods
- Increased transit ridership

Complementary strategies:

- Ramp meter bypass lanes for carpools

Responsible agency(s): State Department of Transportation, county transportation commissions, MPOs, cities

Primary stakeholders:

- Caltrans
- County transportation commissions
- Traffic management centers

CMP Toolbox – Traveler Information Systems

TSM:

By providing current, accurate information to travelers, they can a) take a mode of transportation other than a motor vehicle, or b) change their route so as to avoid congested areas, thereby reducing the growth in congestion.

Pros:

- Can promote alternate modes of transportation
- By avoiding congested areas, motorists can help mitigate the local congestion

Cons:

- Can be expensive to develop/maintain
- Requires coordination between technologies across jurisdictions

How do you measure this? Number of times 5-1-1 is accessed on daily basis or during peak hours

Examples of quantifiable performance goal: Increase the number of users of 5-1-1 system by XX% through 2020.

Implementation costs:

- Promotion costs

Congestion impacts:

- Can reduce congestion, but difficult to quantify benefits, when benefits are seen through other TDM or mode split strategies

Complementary strategies:

- Sigalert.com
- 5-1-1 system
- Google maps (traffic)

- Traffic management centers
- Changeable message signs
- Next bus service

Responsible agency(s): State Department of Transportation, county transportation commissions, MPOs, cities

Primary stakeholders:

- County ITS coordinator
- California Highway Patrol
- Local police force

- Freeway patrols
- Caltrans

CMP Toolbox – Signal Synchronization

TSM:

By synchronizing traffic signals on major arterials, the efficiency of the existing roadways can be increased somewhat without increasing capacity..

Pros:

- Reduces vehicle idling time at intersections
- Increases LOS as traditionally measured

Cons:

- Can be expensive to develop/maintain
- Can require communication/coordination between technologies across jurisdictions

How do you measure this? AADT, delay, average travel time

Examples of quantifiable performance goal: Reduce average travel time by X.

Implementation costs:

- Installation costs are higher than traditional signals

Congestion impacts:

- Can reduce congestion, but difficult to quantify benefits, when benefits are seen through other TDM or mode split strategies

Complementary strategies:

- Sigalert.com
- 5-1-1 system
- Bus preemption signal for signals
- Google maps (traffic)

- Traffic management centers
- Changeable message signs
- Next bus service

Responsible agency(s): Counties, cities

Primary stakeholders:

- City/county ITS coordinator
- California Highway Patrol

- Local police force
- Caltrans

REGIONAL TRANSPORTATION PLAN
2012–2035 RTP
SUSTAINABLE COMMUNITIES STRATEGY
Towards a Sustainable Future



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