III. TRANSPORTATION STRATEGY

The mobility challenges presented in Chapter II are linked to the continued growth of the SCAG region. The demographic, economic, and geographic constraints unique to our region exacerbate the condition of an already burdened transportation system. To address these challenges, this chapter identifies the policies, strategies, and investments necessary to maintain, manage, and improve the region's transportation system through the year 2035. This vision reflects a regional consensus achieved over the last four years.

The chapter is organized into three main sections. The first section discusses SCAG's efforts to enhance transportation security and safety measures in the region, and specifically lists SCAG's responsibilities in emergency preparedness. The second section describes the various transportation strategies the SCAG region has agreed to fund and implement through 2035. Particular focus is given towards the regional goods movement system because of the critical impact it has on the region's mobility, economy, and public health. The complete listing of RTP investments is contained in the separate RTP Project List available at www.scag.ca.gov. The third and last section identifies the environmental impacts posed by the transportation strategies listed in this chapter, and describes feasible approaches to mitigate those impacts.

Security and Safety First

TRANSPORTATION SECURITY

The SCAG region is vulnerable to many types of catastrophic events including earthquakes, floods, fires, hazardous material incidents, dam failures, civil unrest, transportation accidents, tsunamis and terrorism.

California, through hard experience, has in place an emergency and response structure designed to be innovative to the different locations and types of emergency. There are many agencies that will participate in the response to a disastrous event and ensure that their jurisdictions are prepared to respond to these hazards. To assist in this effort, this chapter identifies SCAG's potential role and responsibility in regards to the relationship between transportation and emergency preparedness.

SECURITY AND EMERGENCY PREPAREDNESS

SCAG's Regional Preparedness Goal is stated as, "to achieve and sustain at risk target levels of capability to prevent, protect against, respond to, and recover from major human-caused or natural events in order to minimize the threat and impact to lives, property, and the region."

SCAG'S ROLE

SCAG does not intend to undertake a first response or emergency management role. As a metropolitan planning organization (MPO), SCAG is limited to essentially three roles:

1. Provide a policy forum to help develop regional consensus and education on security policies and emergency response;
2. Assist in the planning and programming of transportation infrastructure repairs; and
3. Leverage projects and planning functions (including Intelligent Transportation Systems, also known as ITS) that can enhance or provide benefit to transportation security efforts and those responsible for planning and responding to emergencies:
   - Integrate security into the regional ITS architecture; and
   - Become a central repository/mirror for regional geo-data that can be used for planning, training, response and relief efforts of law enforcement personnel and emergency responders.

POLICIES

Within the goal of transportation security, SCAG aims to help prevent, protect from, respond to, and recover from major human-caused or natural events in order to minimize the threat and impact to lives, property, the transportation network and the regional economy.

Through stakeholder input, the Southern California Association of Governments (SCAG) developed an action plan and constrained policies detailing nine measures that the agency will undertake in the region's transportation security planning.

1. SCAG should help ensure the rapid repair of transportation infrastructure in the event of an emergency.
   a. SCAG, in cooperation with local and state agencies, should identify critical infrastructure needs necessary for: a) emergency responders to enter the region; b) evacuation of affected facilities; and c) restoration of utilities.
   b. SCAG, in cooperation with CTCs, California, and the Federal Government, should develop a transportation recovery plan for the emergency awarding of contracts to rapidly and efficiently repair damaged infrastructure.
2. SCAG should continue to deploy and promote the use of intelligent transportation system technologies that enhance transportation security.
   a. SCAG should work to expand the use of ITS to improve surveillance, monitoring and distress notification systems and to assist in the rapid evacuation of disaster areas.
   b. SCAG should incorporate security into the Regional ITS Architecture.
   c. Transit operators should incorporate ITS technologies as part of their security and emergency preparedness and share that information with other operators.
   d. Aside from deploying ITS technologies for advanced customer information, transit agencies should work intensely with ethnic, local and disenfranchised communities through public information/outreach sessions ensuring public participation is utilized to its fullest. In case of evacuation, these transit dependent persons may need additional assistance to evacuate to safety.

3. SCAG should establish transportation infrastructure practices that promote and enhance security.
   a. SCAG should work with transportation operators to plan and coordinate transportation projects, as appropriate, with the Department of Homeland Security grant projects, to enhance the regional transit security strategy (RTSS).

b. SCAG should establish transportation infrastructure practices that identify and prioritize the design, retrofit, hardening, and stabilization of critical transportation infrastructure to prevent failure, to minimize loss of life and property, injuries, and avoid long term economic disruption.

c. SCAG should establish a Transportation Security Working Group (TSWG) with goals of RTP consistency with RTSS, and to find ways SCAG programs can enhance RTSS.

d. SCAG should establish transportation infrastructure practices that identify and prioritize the design, retrofit, hardening, and stabilization of critical transportation infrastructure to prevent failure, to minimize loss of life and property, injuries, and avoid long term economic disruption.

4. SCAG should establish a forum where policy-makers can be educated and regional policy can be developed.

   a. SCAG should work with local officials to develop regional consensus on regional transportation safety, security, and safety/security policies.

5. SCAG will help enhance the region's ability to deter and respond to acts of terrorism and human-caused or natural disasters through regionally cooperative and collaborative strategies.

   a. SCAG should work with local officials to develop regional consensus on regional transportation safety, security, and safety/security policies.

   b. SCAG should encourage all SCAG elected officials to be educated in National Incident Management System (NIMS).

   c. SCAG should work with partner agencies, federal, state and local jurisdictions to improve communications and interoperability and to find opportunities to leverage and effectively utilize transportation and public safety/security resources in support of this effort.

6. SCAG will work to enhance emergency preparedness awareness among public agencies and with the public at large.

   a. SCAG should work with local officials to develop regional consensus on regional transportation safety, security, and safety/security policies.

7. SCAG should work to improve the effectiveness of regional plans by maximizing the sharing and coordination of resources that would allow for proper response by public agencies.

a. SCAG should encourage and provide a forum for local jurisdictions to develop mutual aid agreements for essential government services during any incident recovery.

8. SCAG will help to enhance the capabilities of local and regional organizations, including first responders, through provision and sharing of information.

   a. SCAG should work with local agencies to collect regional GeoData in a common format, and provide access to the GeoData for emergency planning, training and response.

   b. SCAG should establish a forum for cooperation and coordination of these plans and programs among the regional partners including first responders and operations agencies.

   c. SCAG should develop and establish a regional information sharing strategy, linking SCAG and its member jurisdictions for ongoing sharing and provision of information pertaining to the region's transportation system and other critical infrastructure.

9. SCAG should provide the means for collaboration in planning, communication, and information sharing before, during, or after a regional emergency.

   a. SCAG should develop and incorporate strategies and actions pertaining to response and prevention of security incidents and events as part of the on-going regional planning activities.

   b. SCAG should offer a regional repository of GIS data for use by local agencies in emergency planning, and response, in a standardized format.

   c. SCAG should enter into mutual aid agreements with other MPOs to provide this data, in coordination with the California OES in the event that an event disrupts SCAG's ability to function.

TRANSPORTATION SAFETY

The safety of the region's multimodal system is a critical priority for SCAG and the California Department of Transportation (Caltrans), who owns and operates the State Highway System. When examined historically, fatal and injury collisions (rate per million vehicle miles traveled) have steadily decreased in California since the 1930s.

While traffic fatalities in the SCAG region are below the rest of California (the SCAG region represents almost half of California's population), the number of fatalities has increased every year since 1999 after declining in the latter part of the 1990s.

In 2005, just over 1,800 people in the SCAG region were killed in traffic accidents. Statewide, 4,304 were killed. Every year since 2002, the total number of traffic injuries in the SCAG region have surpassed that in the rest of the state. Much of that can be attributed to the growth in vehicle miles traveled.

Additionally, in 2005, 372 pedestrians and 66 bicyclists were killed in the SCAG region, representing 50 percent of pedestrians and 57 percent of bicyclists killed in California.

The 2008 RTP continues the commitment to improve safety for the region. In 2007, the region fully funded highway collision reduction and emergency response needs, estimated at $317 million and $110 million, respectively. This was the only category that was fully funded. Activities within this category include the construction of median barriers and response to land slides, as depicted in Exhibits 3.1.1 and 3.1.2.

EXHIBIT 3.1.1 HIGHWAY COLLISION REDUCTION MEASURES

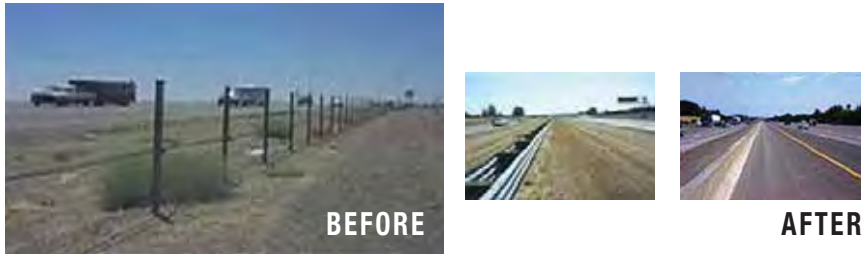


EXHIBIT 3.1.2 EMERGENCY RESPONSE NEEDS

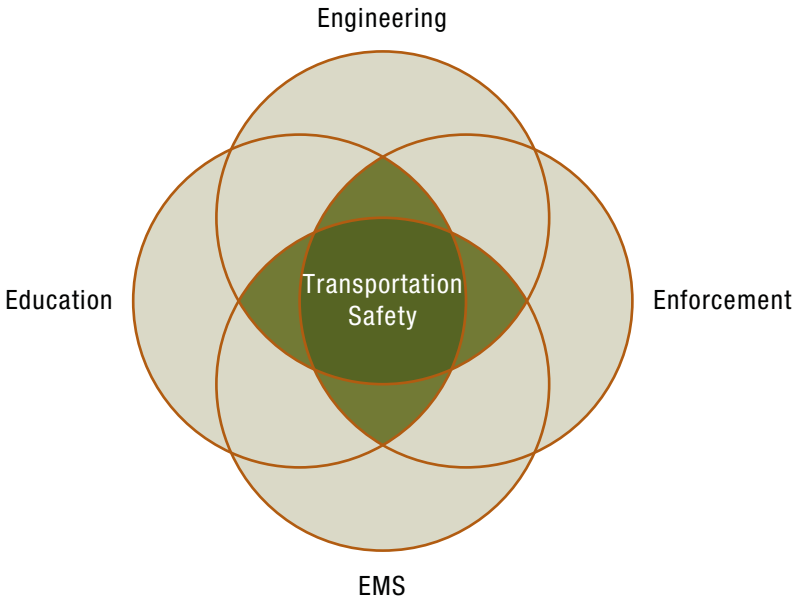
Through 2035, the RTP forecasts expenditures of $10 billion for safety related projects and services. This is in addition to safety standards considered as part of every project design. The scope of this RTP goes beyond specific funding for safety preparedness or emergency response. It emphasizes the collaboration among SCAG, Caltrans, and its stakeholders to examine safety on a system basis so the region can use all the tools available to decrease traffic injuries and fatalities. The result of this collaboration is the California Strategic Highway Safety Plan.

CALIFORNIA STRATEGIC HIGHWAY SAFETY PLAN

In 2005, the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) was passed. The legislation required that each state develop a Strategic Highway Safety Plan (SHSP) and that all metropolitan long range transportation plans should be consistent with the SHSP.

When addressing transportation safety, the four Es are frequently referenced to describe the multidisciplinary nature of transportation safety planning. The four Es are Engineering, Education, Emergency Medical Services (EMS), and Enforcement. The area in which planners have the most ability to effect change is likely to be engineering and the development of physical improvements to the transportation system.[1]

FIGURE 3.1 THE FOUR "E" ELEMENTS IN TRANSPORTATION SAFETY PLANNING



Additionally, a fifth E, or Evaluation, can be applied to this paradigm. Evaluation refers to monitoring and reviewing the effectiveness of the other four Es, allowing modifications where applicable. The California draft SHSP lists 16 challenge areas designed to reduce accidents, fatalities and injuries. Figure 3.2 presents the 16 challenge areas and resultant strategies that were developed during several workshops held by Caltrans for various stakeholder agen-

[1] Transportation Planner's Safety Desk Reference, Report No. FHWA-HEP-07-005

FIGURE 3.2 CHALLENGE AREAS AND THE CORRESPONDING REGIONAL RESPONSE AS OUTLINED IN THE STRATEGIC HIGHWAY SAFETY PLAN (SHSP)

SAFETEA-LU requires that the region's plan be consistent with the California Strategic Highway Safety Plan

SHSP Challenge Area	RTP Discussion	Regional Response
• Reduce the Occurrence and Consequence of leaving the roadway and head-on collisions • Improve Driver Decisions about Rights of Way and Turning • Improve Intersection and Interchange Safety for Roadway Users • Make Walking and Street Crossing Safer • Improve Safety for Older Roadway Users • Improve Commercial Vehicle Safety • Improve Bicycle Safety	In Safety Chapter	• Identify projects that address safety in designated "hot spots" • Encourage transportation projects that specifically enhance safety or complement education, enforcement or EMS for each challenge area • Request RTP project submissions that identify the portion of the project that is applied to safety elements and/or project components for motorized and non-motorized users, including older drivers, bicyclists and pedestrians.
• Reduce Impaired Driving Related Fatalities • Ensure Drivers are Licensed and Competent • Increase Use of Safety Belts and Child Safety Seats • Reduce Young Driver Fatalities • Reduce Speeding and Aggressive Driving • Improve Motorcycle Safety • Enhance Work Zone Safety • Improve Post Crash Survivability • Improve Safety Data Collection, Access and Analysis	Outside of SCAG's RTP Role	• Endorse Cooperation with regional and local law enforcement, emergency response and education agencies as they address these transportation safety challenges. • Work with the state and county transportation commissions to determine if various project submissions have potential benefit to safety in these challenge areas.

cies statewide, including SCAG. Each Challenge Area contains the following elements:

- Establishment of a goal for improving safety by 2010.
- Background information on the Challenge Area including a history of fatalities from 1995 – 2004.
- Strategies being considered for implementation to achieve the Challenge Area goal.
- Institutional and other issues that could affect the success of the implementation.

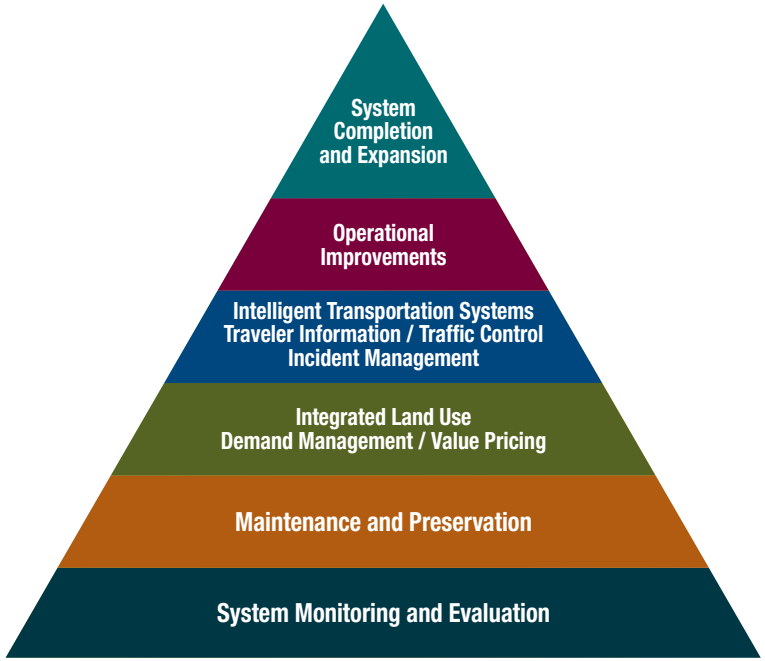
Separate security and safety reports elaborates on the contents of this table.

Managing Our Transportation System Wisely

The region recognizes that maintaining and improving mobility will no longer depend solely on its ability to expand its multimodal transportation system. Instead, an integrated approach--based on the statewide GoCalifornia initiative--is needed to maximize mobility. Depicted in Figure 3.1, the five elements of the pyramid represent integrated strategies that work cooperatively to maximize mobility. The pyramid depicts the idea that transportation investments would have more impact if they are prioritized strategically as suggested. System monitoring and evaluation are the basic foundation upon which the other strategies are built. System expansion and completion will provide the desired mobility benefits to the extent that investments in, and implementation of, the strategies below it achieve progress. An improvement in mobility will occur when strategic investments in each of the elements are coordinated between the elements. The mobility pyramid provides the framework for the discussion of the RTP's transportation investment strategies.

Complementing our transportation investment philosophy is the performance measures approach utilized in developing this Plan. While the pyramid approach ensures that our funding priorities are clear and rational, performance measures ensure that the best performing projects are included in the Plan for funding.

FIGURE 3.3 MOBILITY PYRAMID



SYSTEM MONITORING AND EVALUATION

In order to be effective system managers, we must have an in-depth understanding of how our system performs and why it performs that way. For instance, we all know congestion is a problem in the region. But we must also be able to quantify congestion and understand its various causes. Only by understanding these causes can we identify the optimal mix of strategies and projects that yield the highest returns on the region's

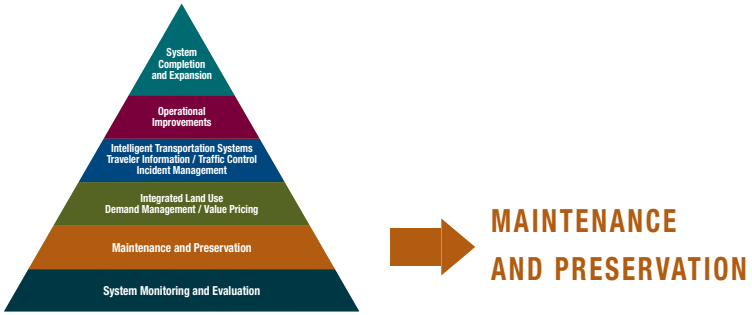
investments. The same holds true for transit, goods movement, and aviation.

The base of the mobility pyramid, entitled "System Monitoring and Evaluation," is the foundation of sound system management. It calls for the use of performance measures to track and monitor the progress of the transportation system so that the region can make informed decisions regarding transportation investments. Transportation professionals and decision-makers have

recently committed to improving the region's ability to properly fund the investments needed to comprehensively monitor and evaluate system performance. These investments include detection, closed circuit television systems, bus global positioning systems, and automatic ridership counting systems. Although funding is modest for these activities, they lead to more informed decisions. Further discussion of system monitoring is contained in Chapter VI.

As we move forward, our focus will evolve into a comprehensive system management approach, which aims to protect, maximize the productivity of, and strategically expand our transportation system.

PROTECTING OUR REGION'S TRANSPORTATION ASSETS



Over the decades, the region has invested hundreds of billions of dollars in our multimodal transportation system. The system is now aging and requires immediate attention. Preserving our assets is a critical priority of this RTP.

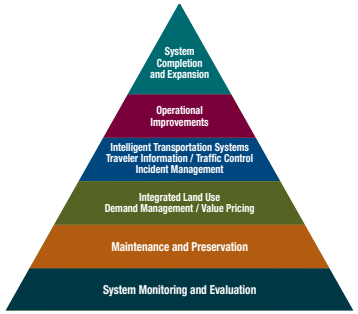
In a sense, the region must make up for past funding shortfalls. As discussed in Chapter II, roadway expenditures have not kept up with demand over the last three decades. As a result, we have not properly funded roadway preservation needs. The recent passage of the Infrastructure Bond injected much needed funding to highway preservation. However, SCAG estimates that an additional $30 billion is required to bring the system into a comprehensive state of adequate repair.

SCAG also estimates that an additional $10 billion is required for arterials and transit preservation needs. The subsequent shortfall for highway, arterial, and transit preservation needs totals $40 billion. Deferring maintenance only increases this shortfall over time.

Recognizing that every dollar expended today to address this shortfall would save much more in the future, the region committed $8 billion of new funding to preservation, thereby addressing at least 20 percent of preservation

needs. As more funding becomes available, additional commitments will be made. These additional investments will ensure that over the next thirty years, our infrastructure will be in a better condition than it is today. This also means that user costs (e.g., vehicle maintenance costs) will decline compared to today.

SCAG will continue to work with its stakeholders, particularly county transportation commissions and Caltrans, to prioritize funding for preservation and maintenance.



INTEGRATED LAND USE AND DEMAND MANAGEMENT

The next set of strategies on the mobility pyramid focus on better managing demand on the transportation system through the integrated growth forecast, a statement of advisory land use policies and strategies and encouraging alternative modes of travel.

INTEGRATED GROWTH FORECAST

In February 2005, SCAG initiated the 2008 RTP Growth Forecast Update Process, now known as the 2008 "Integrated Growth Forecasting" process. The resulting Baseline Growth Forecast established the projected population, employment, households and housing units for use in the 2008 RTP.

The Baseline Growth Forecast sets the stage for a future regional growth scenario as it ties housing to transportation planning, considering both needs simultaneously in communities throughout the region. This approach ensures that the resulting assumptions are consistent with planned transportation

infrastructure. Based on a combination of recent and past trends, reasonable key technical assumptions, and existing and new local policy options, the Baseline Growth Forecast provides the basis for developing the land use assumptions at the regional and small area levels which build the 2008 RTP Plan Alternative. A detailed description of the growth forecast methodology is available in the 2008 RTP Growth Forecast Report.

Advisory Land Use Policies and Strategies

The 2008 RTP Plan Alternative incorporates the Baseline Growth Forecast and the approved transportation network. However, in the rapidly growing SCAG region, these trends could be tempered, and in some cases bolstered, by policies and strategies designed to improve future travel patterns and vehicle emissions. In response, SCAG adopted a set of advisory land use policies and strategies for future regional planning efforts and for localities to consider as they accommodate future growth. These policies and strategies were founded upon the principles developed through the regional growth visioning efforts begun in 2001.

- **Identify regional strategic areas for infill and investment**

  Identify strategic opportunity areas for infill development of aging and underutilized areas and increased investment in order to accommodate future growth. This strategy makes efficient use of existing and planned infrastructure, revitalizes communities, and maintains or improves quality of life.

  Strategic areas are primarily identified as those with potential for:

  - Transit-oriented Development (TOD)
  - Existing and emerging centers
  - Small mixed use areas

- **Structure the plan on a three-tiered system of centers development**

  Identify strategic centers based on a 3-tiered system of existing, planned, and potential, relative to transportation infrastructure. This strategy more effectively integrates land use planning and transportation investment.

- **Develop "complete communities"**

  Create mixed use districts or "complete communities" in strategic growth areas, through a concentration of activities with housing, employment, and a mix of retail and services, located in close proximity to each other. Focusing a mix of land uses in strategic growth areas creates complete communities wherein most daily needs can be met within a short distance of home, providing residents with the opportunity to patronize their local area and run daily errands by walking or bicycle rather than by automobile.

- **Develop nodes on a corridor**

  Intensify nodes along corridors with people-scaled, mixed use developments. Many existing corridors lack the residential and commercial concentration to adequately support non-auto transit uses, without which the existing transit system cannot fully realize its potential for accommodating additional trips and relieving the transportation system. These nodes along the corridor also create vibrant, walkable communities with localized access to amenities, further reducing reliance on the automobile for a variety of trips.

- **Plan for additional housing and jobs near transit**

  Pedestrian-friendly environments and more compact development patterns in close proximity to transit serve to support and improve transit use and ridership. Focusing housing and employment growth in transit accessible locations through this transit-oriented development approach will serve to reduce auto use and support more multimodal travel behavior.

- **Plan for a changing demand in types of housing**

  Shifts in the labor force, as the large cohort of aging "baby boomers" retire over the next 15 years and are replaced by new immigrants and "echo boomers," will likely induce a demand shift in the housing market

for additional development types such as multi-family and infill housing in central locations, appealing to the needs and lifestyles of these large populations.

- **Continue to protect stable existing single family areas**

  Continue to protect stable existing single family neighborhoods as future growth and a more diverse housing stock are accommodated in infill locations near transit stations, in nodes along corridors and in existing centers. Concurrently, focusing growth in central areas and maintaining less development in outlying areas, preserves the housing option for large-lot single family homes, while reducing the number of long trips and vehicle miles traveled to employment centers.

- **Ensure adequate access to open space and preservation of habitat**

  Ensure access to open space and habitat preservation despite competing quality of life demands driven by growth, housing and employment needs, and traditional development patterns. Development patterns that focus growth in centers and corridors make the most efficient use of developed land and minimize encroachment on public open space and natural habitat. This approach would ensure improved access to existing large-scale and neighborhood-scale open space.

- **Incorporate local input and feedback on future growth**

  Continue public outreach efforts and incorporate local input through the Integrated Growth Forecast process. This innovative approach provides a more accurate forecast that integrates future land use and transportation planning through growth projections for population, employment, households and housing units. Public workshops, scenario planning, and stakeholder outreach improve the accuracy and feasibility of pursuing regional plans at the local level.

These policies have evolved since 2001, when SCAG initiated one of the first large-scale regional growth visioning efforts in the nation. Through its Compass Blueprint Growth Vision, SCAG sought to integrate land use and transportation through a consensus-built regional plan. Compass Blueprint was developed with the goal of accommodating the six million additional residents expected by 2030, while improving mobility for all residents, fostering livability in all communities, and enabling prosperity for all people, and promoting sustainability for future generations. The 2004 Growth Vision Alternative was approved and adopted by the Regional Council as the Preferred Growth Alternative for the 2004 Regional Transportation Plan. The Compass Blueprint principles that were established provide the foundation for the advisory land use policies and strategies adopted in the 2008 Regional Transportation Plan.

These advisory policies and strategies encourage changes to the urban form that improve accessibility to transit, and create more compact development, which yield a number of transportation benefits to the region, including reductions in travel time, vehicle miles traveled, vehicle hours traveled, and vehicle hours of delay, as well as increased transit use and mode share. All of these effects lead to tangible air quality improvements.

SCAG's Compass Blueprint Program has become a model for turning regional vision into local reality. Since 2004, SCAG has used innovative planning tools, creative strategies and dynamic partnerships to expand its Suite of Services and Demonstration Project consulting services that are available to all local governments in the region, free-of-charge.

As a voluntary program, SCAG provides these cutting-edge tools, analyses and comprehensive planning services to cities that seek additional technical expertise or strategic planning in order to implement a plan, ordinance or program consistent with the Compass Blueprint Principles.

Popular tools in the Compass Blueprint Suite of Services include photo-morph and 3D video "fly-through" visualizations, a sophisticated "Tipping Point" return-on-investment tool that simulates a developer's pro-forma for potential projects and the "Envision" GIS based land use scenario-building tool. Building upon the Suite of Services, Compass Blueprint Demonstration Projects combine public participation, design and financial analysis to produce local plans that respond to community interests and are market-feasible, i.e. plans that will be adopted and realized because of their benefits to all stakeholders.

Demonstration Projects range from parcel specific zoning analyses to county-wide plans around transit stations, and include an array of services including tipping point and business functionality analyses, design charrettes and community workshops, housing prototypes and conceptual land use plans, parking studies, and transit-oriented development strategies.

With an ever-growing portfolio of completed, documented Demonstration Projects, an expanding Suite of Services, and significant improvements to existing tools, implementation efforts have seen sustained improvement since the Growth Vision was adopted. SCAG recently launched "Toolbox Tuesdays," a series of training seminars for local planning staff through which they can learn the skills and software capabilities necessary to build their own in-house capacities for using the Compass Blueprint-developed tools. This transferability is a cornerstone of the implementation strategy. Demonstration Projects are scoped to be just that - examples for others to emulate. The Compass Blueprint website and annual Awards Program event are other important vehicles for sharing lessons learned. Services have been sought through the Compass Blueprint program for over 50 sites in jurisdictions all over the region:

- Azusa
- Baldwin Park
- Brea
- Coachella
- Colton
- Compton
- Corona
- Covina
- El Centro
- El Monte
- Fillmore
- Fontana
- Fullerton
- Glendora
- Hawthorne
- Hemet
- Highland
- Imperial County
- Irwindale
- La Habra
- Lake Elsinore
- Lancaster
- Lawndale
- Los Angeles
- Los Angeles County
- Montclair
- Moreno Valley
- Ontario
- Perris
- Placentia
- Rancho Cucamonga
- Rialto
- Riverside
- Rolling Hills Estates
- San Bernardino
- San Gabriel
- South Pasadena
- Temecula
- Upland
- Ventura (City)
- Ventura County

TRAVEL DEMAND MANAGEMENT

Travel demand management (TDM) strategies are designed to influence an individual's travel behavior by making alternatives to the single-occupant automobile more attractive, especially during peak commute periods. There are two types of TDM Strategies: voluntary, or "soft," strategies – such as preferential parking for carpoolers – that aim to lure some to alter their travel behavior in response to voluntary inducements, and "hard" strategies – such as congestion pricing – that shift the behavior of a large number of travelers by changing the price of travel. TDM also can include regulatory strategies, such as regional employer ridesharing mandates.

TDM strategies that encourage the use of alternatives modes of transportation to the single-occupant vehicle include rideshare (carpools and vanpools), transit (bus and rail), and non-motorized modes (bicycles and walking). Additional TDM strategies include alternative work-hour programs, such as compressed work-week programs, flextime (variable work schedules) and work-at-home (telework-part time and home-based businesses/self-employed-full time) and parking management (preferential parking for carpoolers and parking pricing). Providing the public with reliable and timely traveler information is an operational strategy that allows people to make better decisions about when and how to travel. Knowledge about current travel conditions on the transportation system can be used by travelers to select among alternatives to driving alone or by avoiding making the trip altogether, which is also known as congestion avoidance.

The potential effectiveness of TDM now and in the future depends largely on social and institutional commitments that cause individual travelers to choose a mode of travel other than solo driving, as well as funding (marketing and incentives that change travel behavior). If we were to do nothing beyond our current efforts, the region would not sustain the current levels of ridesharing, non-motorized and telework/telecommute/work-at-home, let alone expand them over the 2008 RTP period. The region recognizes the importance of TDM strategies and includes a significant level of funding to meet the TDM goals.

The "soft" strategies identified in this Plan include increasing ridesharing, work-at home, and non-motorized transportation. For rideshare, telecommute, and park-n-ride activities, the RTP provides investments of over $1.3 billion through 2035. In the future, we will need to emphasize some of the "hard" strategies, especially parking and congestion pricing. This will require significant analysis, consensus building, and public education. However, pricing benefits have proven to be more sustainable over time and complement the integrated land use strategies adopted by the region.

Increasing Rideshare (Carpool and Vanpool)

The SCAG Region continues to invest heavily in High Occupancy Vehicle (HOV) infrastructure that provides incentives for commuters to share rides with others. While HOV utilization is growing over time, the percent of total travelers using carpools and vanpools is not. SCAG and its partners will strengthen their efforts to encourage this efficient mode, which reduces travel time and improves air quality. These efforts will include:

- Program public funds in the RTIP to help maintain the public sector share of the existing rideshare market and to increase the number of carpools.
- Provide "seamless" intra- and inter-county carpool services to the regional traveler.
- Formalize and expand partnerships among public and private sector stakeholders to improve delivery of vanpool services regionally.
- Increase the number of commuter vanpools through more effective marketing and the provision of non-monetary public sector incentives.
- Identify current dedicated funding sources and work with county transportation commissions and partners on identifying additional new funding sources.
- 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.

Increasing Work-at-Home

Increasing the number of workers who work-at-home (self-employed, home-based business owners) or who telework/telecommute (wage and salary employees conducting some or all of their work from home) decreases home-based work trips, vehicle-miles of travel, congestion and vehicle emissions. National and regional surveys of those who telecommute indicate that it is a lack of support and trust from "management," rather than the provision of equipment or the desire of workers to telecommute, that hampers the growth

of telecommuting. The 2008 RTP, therefore, recommends the following actions:

- Formalize and expand partnerships among public and private sector stakeholders to increase opportunities for wage and salary workers regionally to telecommute in lieu of daily commuting.
- Promote telecommuting to increase opportunities for wage and salary workers regionally to telecommute in lieu of daily commuting.

Non-Motorized Transportation

Commuter trips within the region average a self-reported distance to work of 19.2 miles, too far for many bicyclists and all pedestrians. However, the integration between bicycle and transit nodes offers the opportunity to extend the commuting range of bicyclists. In addition to work trips, there are many ways that bicycling and walking are playing an important role in our transportation system. According to the 2001 National Household Travel Survey, in urban areas, 50 percent of all trips were less than 3 miles, and 28 percent of all trips were less than 1 mile. These trips are ideal for biking, walking, and transit or a combination of those modes of travel.

Caltrans photo © Steve DeVorkin

Bicycle transportation infrastructure has a role in regional mobility and air quality improvements. Every single percent of automobile drivers that switch to alternative transportation choice (walking, bicycles, transit) reduces air pollution, congestion, the need for increasing roadway capacity, and, in the case of walking and bicycling, improves public health.

Bicycle and pedestrian improvements are included as part of many street maintenance and construction projects. These investments and the supporting policies summarized below all aim to maximize the benefits of this efficient mode of transportation.

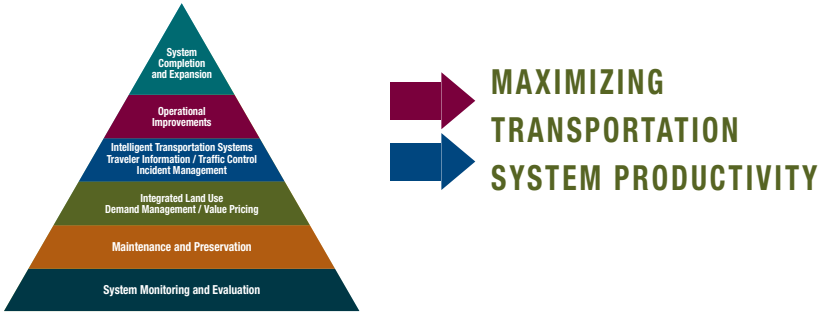
1. Decrease bicyclists and pedestrians fatalities and injuries in the state to 25% below 2000 levels. Ways to address non-motorized safety were discussed under Transportation Safety.
2. Increase accommodation and planning for bicyclists and pedestrians: The needs of non-motorized travel (including pedestrian, bicyclists and persons with disabilities) need to be fully considered for all transportation planning projects.
3. Increase bicycle and pedestrian use in the SCAG region as an alternative to utilitarian vehicle trips: Create and maintain an atmosphere conducive to non-motorized transportation, including well maintained bicycle and pedestrian facilities, easy access to transit facilities, and increasing safety and security. While pedestrian sidewalks are fairly well established in most areas, it is estimated that there are only 3,218 miles of dedicated bicycle facilities in the region, with an additional 3,170 miles planned.
4. Increase non-motorized transportation data: To make non-motorized modes an integral part of the region's intermodal transportation planning process and system, reliable data for planning are needed. Non-motorized transportation data needs include, but are not limited to comprehensive user statistics; user demographics; bicycle travel pat-

terns/corridors; accident mapping; bikeway system characteristics; and sub regional improvements projects and funding needs.

5. Bicycling and Pedestrians should always be included in general plan updates. SCAG also encourages the development of local Non-Motorized Plans. Also, non-motorized plans that have been created or updated within the previous five years are eligible for bicycle transportation account (BTA) funds. SCAG can assist in the development of these plans through the Compass Blueprint Program.

6. Develop a Regional Non-motorized plan: SCAG will work with all counties and their cities to coordinate and integrate all non-motorized plans from counties and jurisdictions in the SCAG region in a collaborative process, including interested stakeholders.

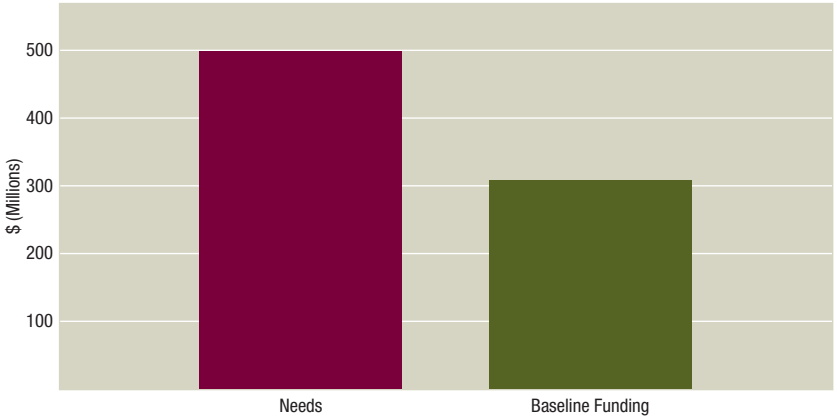
The RTP allocates over $1.8 billion for non-motorized transportation.



The region has built a vast and expensive transportation system. Like any system, it can be operated to be much more productive. Just like a factory can be refined and modernized to produce more output per day or hour, our transportation system can be refined and modernized to carry more people and goods in a day or during peak commute conditions.

Chapter II of this document discussed the lost productivity quantified in terms of "lost lane miles" on the State Highway System. Similar productivity losses occur for all modes when they are not operated adequately. The investments needed to maximize the productivity of our system through 2035 total $308 million, and include implementation of advanced traffic control strategies (e.g., signal coordination, ramp metering), improved incident management, and smaller physical infrastructure modifications (e.g., auxiliary lanes). Figure 3.4 shows that originally planned investments in operational strategies for the highway system reflect a shortfall of approximately $190 million per year.

FIGURE 3.4 SCAG REGION HIGHWAY OPERATIONS NEEDS VS. BASELINE FUNDING, 2007-2035



Source: SCAG estimates based on Caltrans SHOPP and county transportation commission project submittals

The shortfall through 2035 adds up to $8.4 billion once inflation is taken into account. Similarly, SCAG estimates a deficit of $1.6 billion through 2035 for implementing operational strategies for arterials of regional significance and transit.

Recognizing that funding these provide a higher return on investments than most other transportation projects, this RTP allocates an additional $2 billion, representing 20 percent of the shortfall. As these allocations are programmed and implemented, it is SCAG's hope that the benefits will become apparent to decision-makers and the public, and additional funding is secured to address the remaining shortfall.

SCAG will work with stakeholders, particularly the county transportation commissions and Caltrans, to better determine the benefits and cost effectiveness of operational strategies. SCAG will also continue to partner with Caltrans on corridor system management plans.

Transit Operations

In addition to funding for operations, the 2008 RTP highlights the following policies to improve the performance of the regional transit system.

Strategic Transit Service Policies

In an effort to maximize transit productivity, the 2008 RTP calls upon regional transit operators to address significant challenges to achieve better operational efficiency, maintain a discipline of cost recovery through a consistent fare policy, embrace the use of performance metrics to better serve their existing customer base, and attract new transit users. The Plan encourages the regional transit operators to work cooperatively to offer complementary services, with ease of transfer between modes and operators. It further encourages utilization of new intelligent transportation system (ITS) technologies that measures system performance and offers its customers reliable "on-time" performance and real time information.

Reliability and On-Time Performance

On-time performance is the key to delivering the greatest customer satisfaction. Wait times are affected by service irregularities and therefore customers are more sensitive to unpredictable delays. Reliability can also be related to transfer times between buses or between modes (bus to train). When customers experience long unscheduled gaps in service and if timely connections are not made they are less likely to see transit as a viable alternative.

The Plan recommends that SCAG and transit operators analyze and assess the use of ITS technologies to track, report, and improve on-time performance of transit systems. In addition, operators should utilize this data to identify the causes of delay and use it to improve performance of transit systems through operational improvements, rapid bus implementation, and better scheduling of services. SCAG will seek funding in the next OWP (FY08-09) to conduct this assessment.

Transit Service Levels

Frequency of service is also a concern for transit customers. Long waits for service make transit service inconvenient and deter the use of transit. Poor service levels limit the potential use of transit for non work trips for social, retail, recreational, and tourism purposes. SCAG should work cooperatively with regional and local transit operators to develop service delivery policies to optimize transit service levels, including frequency, coverage, and hours of operation to achieve maximum potential use of our transit investments. SCAG will seek funding in next OWP (FY08-09) to conduct this assessment.

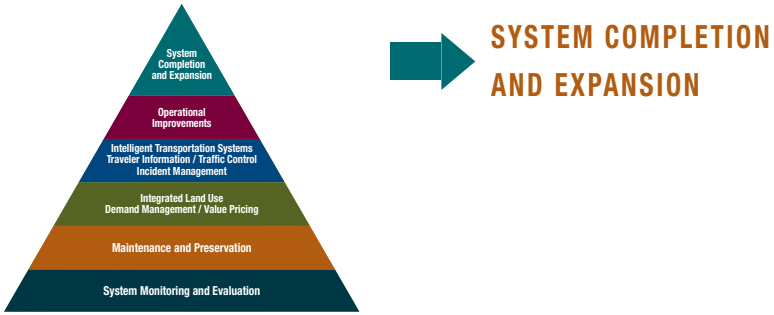
Fare Policies, Fare Media, and Subsidies to Transit

SCAG recommends that an analysis be conducted to identify and recommend appropriate adjustments to transit fares to maximize transit usage, including fare free concepts. This includes utilizing new automated fare media to allow for ease of transit use; increasing subsidy levels to maximize transit usage; and analyzing regional transit fare policies to assess the proper level of fares, optimal fare media to allow for ease of connectivity among transit systems, appropriate subsidy policies, and appropriate mechanisms to assure stable operational funding to maximize transit use in the region. SCAG will seek funding in the next OWP (FY08-09) to conduct this assessment.

Increase Transit Service Connectivity

SCAG recommends that transit operators assess how to better restructure transit services, as needed, to more effectively connect different urban centers and activities. SCAG also recommends that transit operators assess ways to enhance connectivity and ease of transfer between transit modes. In consultation with transit operators, SCAG will conduct an analysis of transit operations, identify existing and emerging hubs and centers, and analyze how to more effectively ensure optimal coverage, access, and connectivity to regional centers. SCAG will also work with transit operators to develop service poli-

cies and route structures that support the RTP land use concepts, facilitate intermodal transit connectivity, and maximize transit usage. SCAG will seek funding in next OWP (FY08-09) to conduct this assessment.



Despite the increases in funding commitments to both preservation and operations, more than half of the available transportation revenues in the region are dedicated to the completion and expansion of our people and goods movement transportation systems. This section first summarizes the expansion investments for the SCAG region by mode, and then presents additional regionally significant expenditures to facilitate and mitigate the movement of goods in the SCAG region.

HIGHWAY IMPROVEMENTS

Major categories of highway improvements included in the 2008 RTP are High Occupancy Vehicle (HOV) lanes and connectors, mixed flow (or general purpose) lanes, toll facilities and High Occupancy Toll (HOT) lanes, and strategic arterial improvements.

A significant number of system expansion projects have already been committed through SCAG's RTIP for the highway network. These priority projects close critical gaps in the system, relieve significant bottlenecks, and address inter-county travel needs. Recent extraordinary increases in the costs of concrete and steel have resulted in substantial project cost increases and forced implementing agencies to piece together enough additional funding to deliver the improvements. Voter approval of Proposition 1B in November 2006 brought much-needed revenue to the table, through programs such as the Corridor Mobility Improvement Account (CMIA). Much of the additional improvements recommended in the 2008 RTP, beyond those projects that are already in the delivery pipeline, have been committed through local sales tax revenues such as those recently approved by voters in Orange, Riverside, and San Bernardino Counties. The proposed projects and strategies are based on a performance framework established for the 2004 RTP and updated for the 2008 RTP.

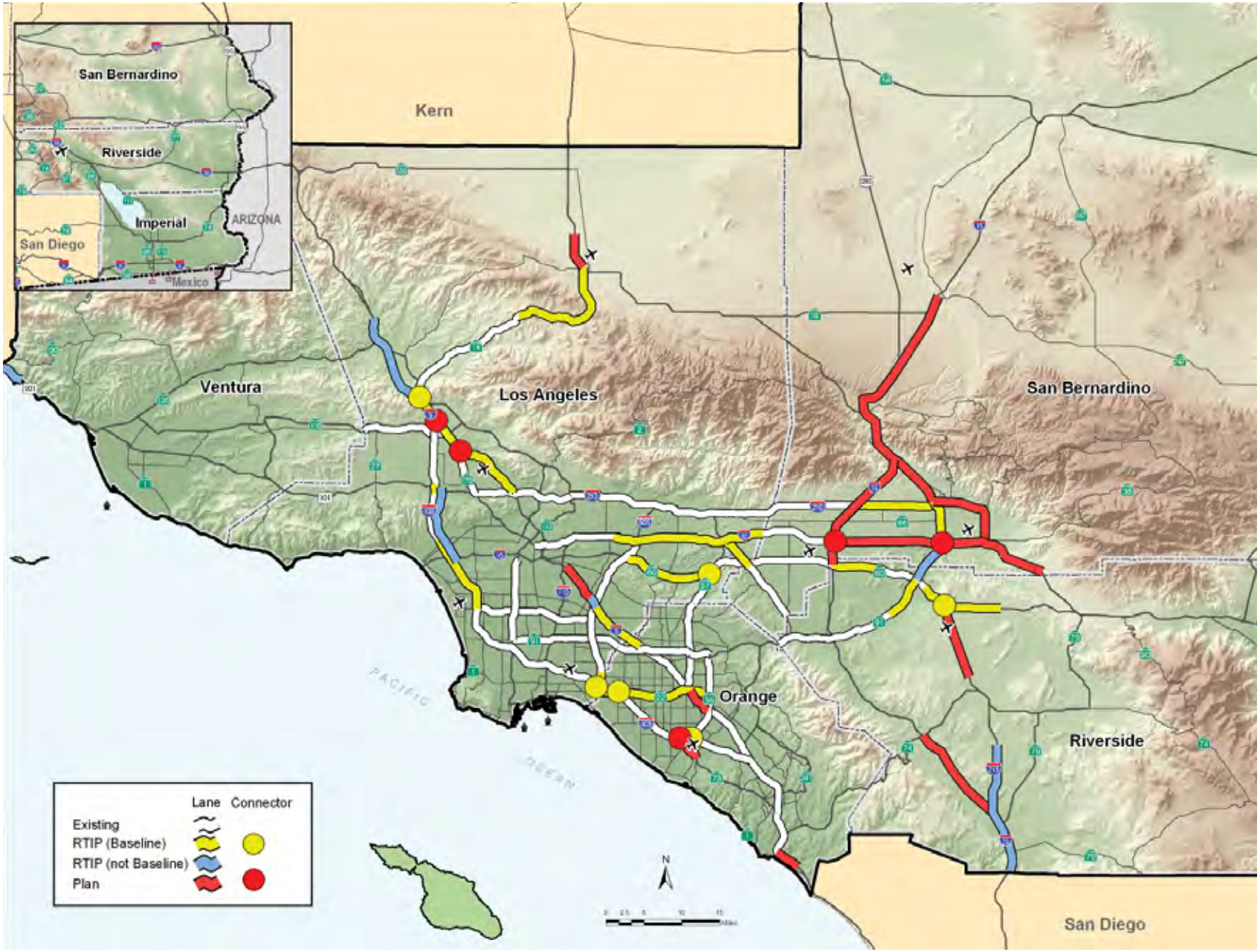
Recently completed Regionally Significant Transportation Investment Studies (RSTIS) have helped to identify additional corridor improvements needed in the SCAG Region. These corridor projects provide capacity enhancements and mobility improvements to address rapidly growing inter-county travel, often on already congested facilities with few alternatives. These projects have been incorporated into the RTP, and they will depend in part on financial contributions from the private sector for their construction, operation, and maintenance.

HOV Gap Closures and Connectors

Southern California has invested heavily in HOV lanes, producing one of the nation's most comprehensive HOV networks and highest rideshare rates. The HOV projects proposed in the RTP focus on strategic gap closures and freeway-to-freeway direct HOV connectors to complete the system. The HOV lane network could eventually serve as the backbone of a regional HOT lane or managed lane system. Determining the feasibility of such a regional system will require further study and discussion before inclusion in a future RTP update.

In 2007, the new SR-22 HOV lanes in Orange County opened as the first continuous-access HOV lanes in Southern California. Monitoring and evaluation of these HOV lanes will conclude in 2008 and transportation officials will decide whether the continuous access will be made permanent.

EXHIBIT 3.2 HOV GAP CLOSURES AND CONNECTORS



Source: Southern California Association of Governments, ESRI StreetMap USA, Teleatlas

The HOV lane system is a regional network and operations should be coordinated across jurisdictional boundaries to optimize performance and minimize confusion. SCAG supports further study and evaluation of these proposed operational changes to the HOV lane system to fully understand the mobility, safety, and air quality impacts, as well as any implications for a potential regional HOT lane system.

Projects in the Pipeline

The RTIP includes HOV gap closures and connectors as shown in Exhibit 3.2.

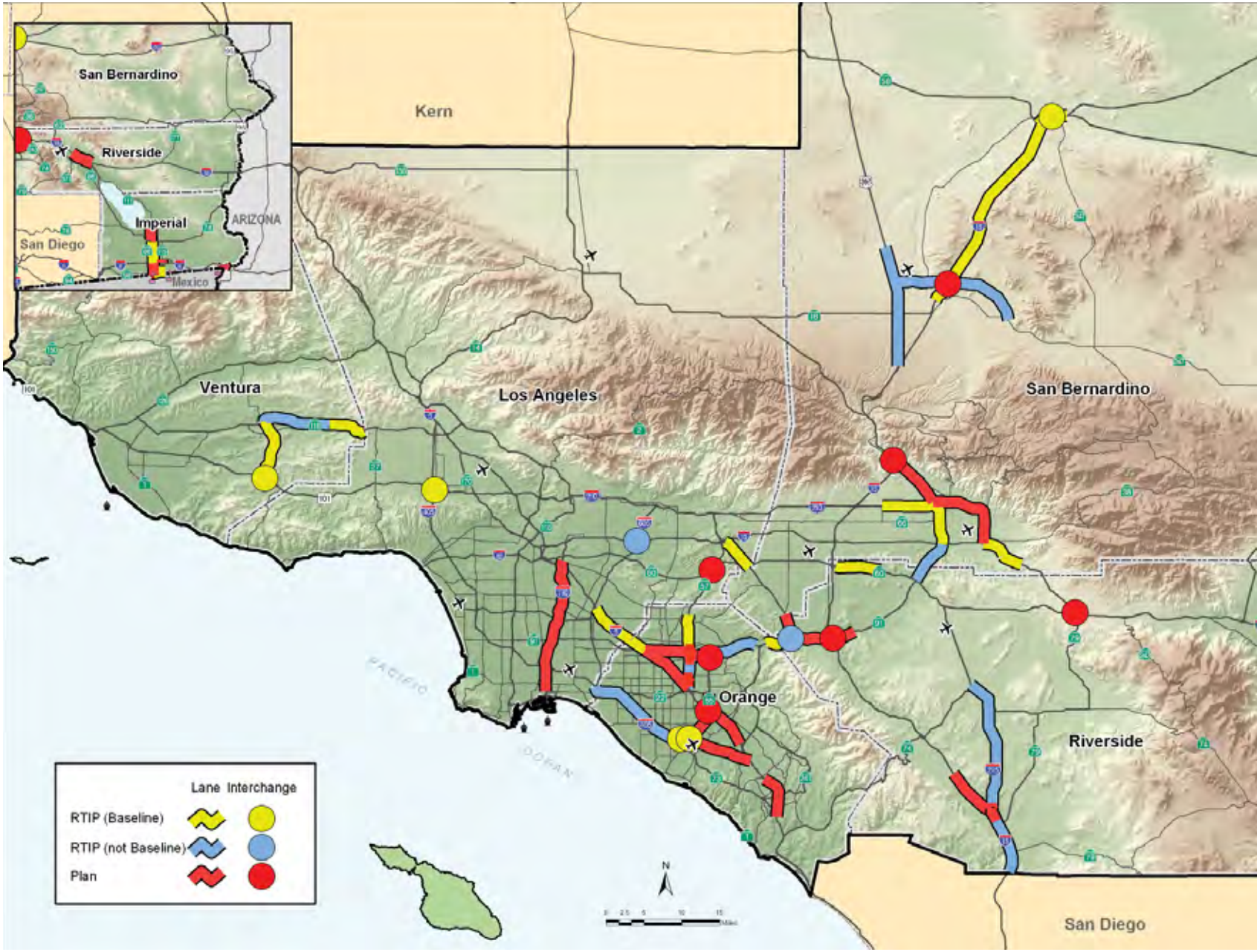
- I-405 in the Westside of Los Angeles
- SR-91 in Riverside
- I-5 and SR-14 connecting the San Fernando Valley to North Los Angeles County
- I-5 and I-605 connecting Los Angeles and Orange Counties
- I-10 and SR-60 connecting Los Angeles and San Bernardino Counties
- SR-60 and I-215 connecting Riverside and San Bernardino Counties
- US-101 connecting Ventura and Santa Barbara Counties
- HOV connectors at I-5/SR-14, SR-57/SR-60, SR-22/I-405, I-405/I-605, and SR-60/I-215

Additional Investments

The 2008 RTP calls for additional investments to extend the HOV network and construct additional connectors, as shown in Table 3.1 and in Exhibit 3.2. It invests close to $8 billion for HOV improvements through 2035. These gap closures and connectors help users to maximize the overall system performance by minimizing weaving conflicts and maintaining travel speeds.

Caltrans photo ©Steve DeVorkin

EXHIBIT 3.3 MIXED FLOW LANE ADDITIONS



Source: Southern California Association of Governments, ESRI StreetMap USA, Teleatlas

TABLE 3.1 HOV AND HOV CONNECTOR PROJECTS

Project	County	Implementation Schedule*
I-5 (SR-19 to I-710)	Los Angeles	2035
SR-14 (Ave P-8 to Ave L)	Los Angeles	2030
I-5 / I-170 connector	Los Angeles	2030
I-5 / I-405 connector	Los Angeles	2030
I-5 (Avenida Pico to Coast Hwy)	Orange	2018
I-5 (SR-55 to SR-57)	Orange	2035
SR-73 (I-405 to MacArthur)	Orange	2035
SR-73 / I-405 connector	Orange	2035
I-15 (I-215 to SR-74)	Riverside	2020
I-215 (Nuevo to Box Springs)	Riverside	2020
I-10 (Haven to Ford)	San Bernardino	2020
I-10 (Ford to Riverside County)	San Bernardino	2030
I-10 / I-15 connector	San Bernardino	2030
I-10 / I-215 connector	San Bernardino	2030
I-15 (Riverside County to I-215)	San Bernardino	2020
I-15 (I-215 to SR-18)	San Bernardino	2020
SR-210 (I-215 to I-10)	San Bernardino	2020
I-215 (SR-210 to I-15)	San Bernardino	2030

** Represents the Plan network year for which a project was analyzed for the RTP modeling and regional emissions analysi*

Mixed Flow

Since mixed flow lanes carry more traffic than any other component of our transportation system, mixed flow capacity enhancements are necessary to address traffic bottlenecks and relieve congestion on heavily traveled corridors. This is especially true in areas outside of the urban core where transit service and the HOV network are not fully developed. The majority of mixed flow projects in the pipeline and proposed in the 2008 RTP are located outside of Los Angeles County.

Projects in the Pipeline

The RTIP contains mixed flow lane additions on the following routes (see Exhibit 3.3).

- Brawley Bypass in Imperial County
- I-5, I-405, and SR-57 connecting Los Angeles and Orange Counties
- SR-91 connecting Orange and Riverside Counties
- CETAP Mid-County Parkway in Riverside County
- SR-60 and I-215 connecting Riverside and San Bernardino Counties
- I-15 and I-215 connecting Riverside and San Diego Counties
- US-395 in northern San Bernardino County
- Completion of the 210 freeway in San Bernardino County
- SR-23, SR-118, and US-101 in Ventura County

Additional Investments

The 2008 RTP invests $26.2 billion through 2035 for mixed flow improvements and interchange ramps. Major mixed flow improvements are listed in Table 3.2 and shown in Exhibit 3.3.

TABLE 3.2 MIXED FLOW HIGHWAY PROJECTS

Project	County	Implementation Schedule*
SR-111 (SR-98 to I-8)	Imperial	2030
I-710 (Ocean Blvd in Long Beach to intermodal railroad yards in Commerce/Vernon)	Los Angeles	2020
I-5 (SR-73 to El Toro)	Orange	2035
I-5 (SR-133 to SR-55)	Orange	2030
I-5 (SR-57 to SR-91)	Orange	2030
SR-55 (I-405 to SR-22)	Orange	2030
SR-57 (Orangewood to Katella)	Orange	2018
SR-57 (Lincoln to Orangethorpe)	Orange	2020
SR-91 westbound (SR-57 to I-5)	Orange	2018
SR-91 eastbound (SR-57 to SR-55)	Orange	2023
SR-91 westbound (SR-241 to Gypsum Cyn)	Orange	2018
I-405 (I-5 to SR-55)	Orange	2035
I-10 (Monterey to Dillon)	Riverside	2030
I-15 (Bundy Cyn to I-215)	Riverside	2014
SR-71 (SR-91 to San Bernardino County)	Riverside	2035
SR-91 (Pierce to Orange County)	Riverside	2018
I-215 (Murrieta Hot Springs to I-15)	Riverside	2014
SR-210 (I-215 to I-10)	San Bernardino	2020
I-215 (SR-30 to I-15)	San Bernardino	2030

** Represents the Plan network year for which a project was analyzed for the RTP modeling and regional emissions analysis*

Toll and High Occupancy Toll (HOT) Lane Corridors and Facilities

The 2008 RTP proposes to expand upon the existing HOT lane and toll road system in Orange County to address the congested commuter corridor between housing-rich Riverside County and job-rich Orange County. Additionally, improvements to several major corridors elsewhere in the region are proposed to be financed by tolls.

Projects in the Pipeline

The RTIP includes lane additions to each of the toll roads in Orange County and the construction of the Foothill South corridor connecting to I-5 in San Diego County (see Exhibit 3.4).

- SR-73 – San Joaquin Hills Corridor
- SR-133/SR-241/SR-261 – Eastern Transportation Corridor
- SR-241 – Foothill Transportation Corridor North
- SR-241 – Foothill Transportation Corridor South (extension to I-5)

Additional Investments

The recommendations from several recent major RSTIS efforts examining inter-county travel have been considered in the development of the 2008 RTP. First, the Riverside County to Orange County study completed in 2006 identifies a comprehensive set of improvements that includes extending the SR-91 Express Lanes into Riverside County and providing direct connections to and from the Express Lanes. Additionally, the study identifies two major new facilities, one parallel to the SR-91 and one on a new alignment further south. Secondly, a North Los Angeles County study completed in 2004 recommended a new east-west facility called the High Desert Corridor to connect the high-growth areas of Lancaster/Palmdale and Victor Valley. While the RSTIS provides input to the RTP on a locally preferred strategy, SCAG recognizes and respects the local processes that must continue to solidify community consensus and further refine each project.

In 2006, MTA completed a technical feasibility study examining the potential for constructing the SR-710 Gap Closure between the I-10 and I-210 freeways as a tunnel. SCAG has further assessed the potential for the Gap Closure to be financed in part through a public-private partnership. A number of tolling structures were considered in the financial analyses, including both flat rate

EXHIBIT 3.4 HOT LANES AND TOLL FACILITIES

Source: Southern California Association of Governments, ESRI StreetMap USA, Teleatlas

and variable toll rate structures. SCAG anticipates that structuring financing alternatives with lower-cost Private Activity Bonds (PABs) and 30- to 50-year term bonds could help to improve shareholders' internal rate of return.

Additionally, SCAG's current evaluations to date indicate that the project is feasible from a construction standpoint. Two 46-foot inner diameter tunnels could provide two levels of lanes. The upper level could include three lanes for passenger vehicles; and two lanes in the middle level could accommodate truck and high occupancy vehicles. The SR-710 Gap Closure is estimated to cost $4.6 billion.

The 2008 RTP invests $25.6 billion for toll and HOT lane facilities. These additional investments are listed in Table 3.3 and shown in Exhibit 3.4.

TABLE 3.3 HOT LANES AND TOLL FACILITIES

Project	County	Implementation Schedule*
SR-710 Tunnel Gap Closure (710/Valley Blvd to California Blvd/Pasadena Ave)	Los Angeles	2020
High Desert Corridor (I-5 to US-395)	Los Angeles / San Bernardino	2030
SR-91 / SR-241 HOT connectors	Orange	2020
CETAP Riverside County to Orange County Corridor A (Parallel to SR-91 from I-15 to SR-241)	Orange / Riverside	2035
CETAP Riverside County to Orange County Corridor B (I-15/Mid-County Pkwy to SR-133/SR-241) Preliminary Engineering and Environmental Impact Report/Statement	Orange / Riverside	PE/EIR/EIS ONLY
SR-91 Express Lanes (extend east to I-15)	Riverside	2020
I-15 HOT Lanes (SR-74 to San Bernardino County)	Riverside	2020
SR-91 / I-15 HOT connectors	Riverside	2020

** Represents the Plan network year for which a project was analyzed for the RTP modeling and regional emissions analysis*

Arterial Improvements

Local streets and roads account for over 80 percent of the total road network and carry a high percentage of total traffic. In many cases arterials serve as alternate parallel routes to congested freeway corridors. In mature urban areas there is often little right-of-way available for capacity enhancements. In the fast-growing suburban and exurban parts of the region, local jurisdictions ensure that roadway capacity improvements keep pace with new developments by implementing mitigation fees. In all parts of the region, operational and technological improvements have the potential to maximize system productivity in a more cost-effective way than simply adding capacity. Such strategic "smart street" improvements include spot widening, signal prioritization, driveway consolidation and relocation, and grade separations at high-volume intersections. The 2008 RTP invests approximately $17.1 billion for arterial system improvements as shown in Table 3.4.

TABLE 3.4 ARTERIAL INVESTMENT SUMMARY

County	Investment (in billions, nominal dollars through 2035)
Imperial	$1.0
Los Angeles	$1.5
Orange	$2.0
Riverside	$6.9
San Bernardino	$4.8
Ventura	$0.9
Regional Total	$17.1

Note: Numbers may not add due to rounding

TRANSIT STRATEGIES

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, shopping, cultural, and recreational activities. The region has experienced substantial growth in daily regional transit trips since 2003, and anticipates the trend to continue.

The goals of public transportation services are to ensure mobility for people without access to automobiles, and to provide attractive alternatives for drive-alone motorists or discretionary riders. The public transportation strategies and programs presented in the RTP are developed with these goals in mind. As listed previously in the chapter, these strategies target improving customer service and system reliability, achieving financial stability for operators, and enhancing the safety and security of the system for all riders and operators.

Transit Expansion

The RTP recommends closing critical gaps in the transit system to improve service, and extending routes to serve a greater number of passengers. Our regional transit investments in new modes and innovative services are a significant factor in achieving increased transit use. The development of new rail and bus transit corridors has also spawned investment in new housing, retail, and business development at and near transit stations.

Projects in the Pipeline

The transit projects that are programmed in the RTIP and ready for implementation include expansions to the Bus Rapid Transit (BRT) system, commuter rail, and light rail. Refer to Exhibit 3.5 for an illustration of bus transit projects, and Exhibit 3.6 for rail projects that are included in the 2008 RTP.

Bus Rapid Transit (BRT) is designed to provide fast, high quality bus service to passengers by taking advantage of signal priority at intersections, operating in mixed traffic or in a dedicated right-of-way, and providing improved bus stop spacing at planned stations. The following BRT projects are programmed in the RTIP:

- Metro Rapid Bus Expansion (to 28 lines) in LA County
- San Fernando Valley North-South BRT (Reseda/Sepulveda & Canoga Corridor) in LA County
- Wilshire Metro Rapidway in LA County
- Harbor Blvd BRT (Fullerton to Costa Mesa) in Orange County
- Westminster/17th BRT (Santa Ana to Long Beach) in Orange County
- 28-Mile BRT (Brea Mall to Irvine Transportation Center) in Orange County
- E Street Transit Corridor (San Bernardino to Loma Linda) in San Bernardino County

Metrolink is the commuter rail service that operates in five Southern California counties. The Southern California Regional Rail Authority (SCRRA) provides and maintains Metrolink services and facilities. The following commuter rail project is programmed in the RTIP.

- Perris Valley Line (Riverside to Perris) in Riverside County

Light Rail Transit (LRT) utilizes electric-powered vehicles that operate primarily on exclusive rights-of-way. The Metro Rail system comprises the Metro Blue, Green, Red, Purple and Gold Lines. LRT projects programmed in the RTIP include:

- Gold Line Eastside Extension (Union Station to Atlantic) in LA County
- Exposition Corridor Phase 1 (Downtown LA to Culver City - Washington/National) in LA County
- Exposition Corridor Phase 2 (Culver City - Washington/National to Santa Monica) in LA County
- Gold Line Foothill Extension Phase 1 (Pasadena to Azusa-Citrus) in LA County
- Crenshaw Corridor in LA County (may be BRT or LRT)

EXHIBIT 3.5 BUS RAPID TRANSIT PROJECTS

Source: Southern California Association of Governments, ESRI StreetMap USA, Teleatlas

EXHIBIT 3.6 RAIL TRANSIT PROJECTS

Source: Southern California Association of Governments, ESRI StreetMap USA, Teleatlas

Additional Investments

The 2008 RTP invests over $44.0 billion to transit projects. Of this amount, nearly $23.3 billion is allocated to bus and intermodal facilities; nearly $6.2 billion to commuter rail projects; and close to $14.5 billion to heavy rail, light rail, and other projects. The major projects included in the RTP that address system gaps and provide strategic corridor expansion are listed in Table 3.5.

TABLE 3.5 TRANSIT CORRIDOR PROJECTS

Project	County	Implementation Schedule*
Regional Connector LRT (Union Station to 7th St/Metro Center)	Los Angeles	2035
Gold Line Foothill Extension Phase 2 (Azusa-Citrus to Montclair)	Los Angeles	2020
Westside Extension (Metro Purple/Red Line Extension)	Los Angeles	2020
Green Line Extension (Mariposa/Nash to Century/Sepulveda LAX, technology TBD)	Los Angeles	2030
Katella BRT (Orange Transportation Center to Long Beach/Blue Line)	Orange	2014
Edinger BRT (Tustin to Huntington Beach)	Orange	2018
Beach Blvd BRT (Huntington Beach to Buena Park)	Orange	2012
La Palma BRT (Anaheim to Buena Park)	Orange	2018
Great Park/Spectrum 5-Mile Transit System	Orange	2012
Western Riverside BRT (Magnolia Corridor Phase 1 City of Riverside; Moreno Valley Corridor Phase 2 City of Moreno Valley)	Riverside	2018
Coachella Valley BRT	Riverside	2018
Perris Valley Line Extension (Perris to San Jacinto)	Riverside	2030
Perris Valley Line Extension (Perris to Temecula)	Riverside	2030
Redlands Extension (4th St/Mt. Vernon to Grove/Central, rail technology TBD)	San Bernardino	2014

** Represents the Plan network year for which a project was analyzed for the RTP modeling and regional emissions analysis*

AVIATION

The SCAG region supports the nation's largest regional airport system in terms of number of airports and aircraft operations, operating in a very complex airspace environment. The system has six established air carrier airports including Los Angeles International (LAX), Bob Hope (formerly Burbank), John Wayne, Long Beach, Ontario and Palm Springs. There are also four new and emerging air carrier airports in the Inland Empire and North Los Angeles County. These include San Bernardino International Airport (formerly Norton AFB), March Inland Port (joint use with March Air Reserve Base), Southern California Logistics Airport (formerly George AFB) and Palmdale Airport (joint use with Air Force Plant 42). Southern California airports play a crucial role in international trade, particularly with Pacific Rim countries, and to the regional economy. The value of airborne commodity exports out of the Los Angeles Customs District are about equal to waterborne exports, and airborne export values would be significantly greater if service exports, including impacts from tourism, were added to total export values.

The aviation strategy is very similar to the 2030 decentralized regional aviation system adopted for the 2004 RTP. It respects all legally-enforceable policy and physical capacity constraints at urban airports. It assumes much more willingness on the part of the airlines to invest in new flights at new and emerging airports, and a package of market and ground access incentives to promote decentralization at under-utilized suburban airports.

The aviation strategy incorporates the HSRT system Initial Operating Segment (IOS) running from West Los Angeles to Ontario Airport, and extending west to LAX and east to San Bernardino International. The region is projected to reach 165.3 million annual passengers (MAP) in 2035 (190.7 MAP including San Diego).

TABLE 3.6 2035 AIR PASSENGER ALLOCATIONS BY AIRPORT

Commercial Airports	Annual Air Passengers (in millions)
Bob Hope	9.4
John Wayne	10.8
LAX	78.9
Long Beach	4.2
March Inland Port	2.5
Ontario	31.6
Palmdale	6.3
Palm Springs	4.1
San Bernardino	9.4
So. Cal. Logistics	2.9
Imperial*	3.5
Oxnard*	1.7
Region Total	**165.3**

** Existing commuter airport with potential to accommodate short-haul service*

Regional Aviation Policies

New regional aviation policies have been developed for the 2008 RTP with input from both the SCAG Aviation Task Force and the SCAG Aviation Technical Advisory Committee. They respond to changing circumstances and new priorities in the regional aviation system. The policies are divided into Aviation Guiding Principles and Aviation Action Steps, as follows:

Aviation Guiding Principles:

- Provide for regional capture of economic development opportunities and job growth created by the prospect of significant regional air traffic growth between now and 2035.

- Distribute maximum opportunity to Southern California airports where population and job growth are expected to be strong and where local communities desire air traffic for economic development.
- Reflect environmental, environmental justice and local quality of life constraints at existing airports that operate in built-out urban environments.
- Reflect that each county should have both the obligation and the opportunity to meet its own air traffic needs where feasible.
- Reflect that the region as a whole has an obligation to help pay the costs of airport environmental mitigation and ground access improvement in counties that serve a disproportionate share of regional air travel demand at their airports.

Aviation Action Steps:

- Support capacity enhancements at existing and potential airports to handle anticipated increases in passengers and cargo volume where it is desired.
- Mitigate the effects of expanding airports and maximize air passenger and air cargo utilization of outlying airports in less-populated areas so that community impacts are minimized.
- Support the continued responsibility of SCAG for developing regional aviation and ground access plans for the region.
- Support the close cooperation between SCAG and other aviation organizations to facilitate the implementation of adopted regional aviation plans prepared by SCAG.
- Support legislative, marketing and ground access initiatives that promote the decentralization of aviation demand to under-utilized suburban airports where it is desired.
- Support more flexible use of airport revenues for off-airport ground access projects.
- Support giving priority to key airport ground access projects in the programming of transportation projects in the RTP and the RTIP.
- Support a the development of a regional network of new flyaways that connect to multiple airports via HOV, light rail and commuter rail facilities, to help decentralize aviation demand to under-utilized suburban airports where it is desired.
- Support efforts to redesign the regional airspace system that may be needed to reduce significant conflicts and delays associated with future air traffic in SCAG's adopted 2035 regional aviation forecast.
- Support a more active role by the federal government in developing substantial incentives for airlines to upgrade their aircraft fleet to cleaner and quieter aircraft.

Air Cargo Forecasts

The aviation strategy forecasts a total of almost 8.3 million tons of air cargo for the region's airports in 2035. The adopted 2030 air cargo forecast for the 2004 RTP was 8,724 tons. There a variety of reasons why the new air forecast is lower than the adopted forecast in the last RTP. These include: more domestic cargo being transported by truck and train, more international air cargo over-flying the region on longer-range aircraft or flying the Arctic Circle route with a stop at Anchorage, and high value-to-weight goods such as computers forecast to be lighter per unit volume. The 2035 modeling results of the air cargo forecast is shown in Table 3.7.

TABLE 3.7 2035 TOTAL ANNUAL AIR CARGO TONNAGE BY AIRPORT (THOUSANDS)

Air Carrier Airports	Air Cargo Tonnage (thousands)
Bob Hope	86
John Wayne	45
LAX	2,496
Long Beach	134
March Inland Port	1,130
Ontario	1,959
Palmdale	781
Palm Springs	129
San Bernardino	1,290
So. Cal. Logistics	230
Region Total	**8,280**

Airport Ground Access

The 2008 RTP may have localized ground access impacts at a number of airports. The RTP will result in significant increases in airport activities (people as well as cargo) at Ontario, San Bernardino International, and Palmdale Airports. RADAM modeling for the Preferred Scenario shows that airport ground access deficiencies are concentrated near airport areas but that background congestion affects both airports and local communities.

SCAG's adopted Regional Aviation Decentralization Strategy calls for making substantial airport ground access improvements throughout the region, in both the short term and long term. The short term program emphasizes relieving immediate bottlenecks around airports through arterial, intersection and interchange improvements, and increasing transit access to airports. Many of these improvements were programmed in the RTIP, and have been updated with strong local input from airport, city and county transportation planners.

SCAG is currently working with Los Angeles World Airports (LAWA) on planning and programming a regional system of FlyAways, based on the very successful Van Nuys FlyAway where passengers park their cars and take a bus to LAX. The locations of the proposed new FlyAways can be optimized by taking advantage of the region's developing high-occupancy vehicle (HOV) and light and heavy rail networks that can provide direct linkages to Ontario and Palmdale as well as LAX. Making seamless HOV and rail connections with enhanced service to those and other suburban airports will also compose SCAG's short- and medium-range airport ground access strategy. The FlyAway, HOV and rail improvements to the suburban airports will help establish a pattern of decentralization, by attracting a critical mass of passengers and airline service

at those emerging airports. SCAG is also working with the newly-reactivated SCRAA in its ongoing efforts to restructure and redefine its mission, with the focus of helping to implement the Regional Aviation Decentralization Strategy through facilitating key airport ground access improvements.

Over the long term, SCAG aviation demand modeling indicates that the region will also need a system of high-speed rail to the suburban airports to reach our adopted air passenger and air cargo forecasts, which are moderate and even conservative when compared to other forecasts for the region such as those developed by the FAA. The high speed, reliability and predictability of high speed airport access will be needed to overcome mounting and increasingly unpredictable traffic congestion. For example, the Initial Operating Segment of SCAG's proposed high-speed rail system from West Los Angeles to Ontario Airport will take only 33 minutes to travel from end to end, compared to over two hours by car in 2030. The regional high-speed rail system is an integral component of the 2008 RTP Preferred 2035 regional aviation demand forecast.

Provision of high-speed rail service to the suburban airports would also provide significant economic benefits to region. It is estimated that the regional aviation system with a full high-speed rail network would create an additional 76,600 direct, indirect and induced jobs by 2035, compared to a system with no high-speed access. These would include an additional 28,900 jobs from high-speed access to Palmdale Airport, and an additional 27,100 jobs from high-speed access to San Bernardino International Airport.

HIGH-SPEED REGIONAL TRANSPORT

SCAG has advanced a vision of regional transport based on high performance, high-speed, and environmentally sensitive alternative(s). A High-Speed Regional Transport (HSRT) system has the potential for relieving both airport and freeway congestion in urbanized areas by providing an alternative to the automobile as well as making less congested airports more accessible to air travelers, and providing alternative capacity for freight movement in the region.

The HSRT system is a long-term vision connecting the region's ports, airports, and urban activity centers. The system can be constructed in multiple stages that can each be financially viable. The financial performance will be enhanced as the system is extended throughout the region and the volume of users increases. The HSRT plan is constructed on three core components:

- **Goods Movement / Logistics:**
  Connect the San Pedro Bay ports with an inland port facility via the high-speed, high-capacity link. This would provide capacity to handle containers relieving a major constraint to port expansion and facilitate efficient and environmentally sensitive goods handling in areas that have sufficient space outside of the urban areas. A detailed discussion on goods movement strategies is included in this chapter.

- **Aviation System:**
  Create a direct and reliable link capable of connecting airports and urban centers. Continue use of LAX as a major hub and sharing de-

mand with other regional airports such as Ontario International Airport (ONT), Palmdale Regional Airport (PMD) and San Bernardino International Airport (SBD) based on a high-speed connection via the HSRT. This would enable a higher level of service for airport access and connecting passengers, improved operation of the aviation system for passengers and airborne cargo, and optimize investment in aviation system infrastructure.

- **Surface Transport System:**

  Link urban activity centers throughout the region, serving the needs of commuters while reducing the number of private vehicles on the road. This would lead to reduced traffic congestion, enhanced accessibility between activity centers, as well as reduced air and noise pollution from automobiles. Additionally, enhanced accessibility at transit stations would enable intensification of land uses and thereby encourage more effective land use patterns.

The SCAG HSRT system will ultimately grow to cover over 275 miles of corridors in the SCAG region, and will move up to 500,000 riders a day. When fully deployed, the HSRT system could complement the regional state highway transportation system. The HSRT program also envisions a longer-term connection to San Diego and other southern airports in the SCAG Region, a connection between San Bernardino and Palmdale via a high desert alignment, an LAX to Orange County route, a San Bernardino to the Coachella Valley segment, interlining with the proposed state high-speed rail system.

The California High-Speed Rail Authority (CHSRA) has been commissioned to do preliminary development work on several north/south corridors. SCAG has supported the Antelope and San Joaquin Valley corridors (Resolution #96-357-1-B). The State of California should coordinate all high-speed rail-planning activities with SCAG and other stakeholders within the state, especially with regard to HSRT, aviation, environment, growth, access, finance, and community development. SCAG is supportive of CHSRA's efforts to build a high-speed rail system in Southern California.

Three phases have been developed to implement the HSRT deployment program:

- **Phase I**, Pre-Deployment Analysis, was completed in October 2003 and includes right-of-way assessment on the freeway system and railroad corridors, assessment of ridership and interaction with other transportation systems, Los Angeles Union Passenger Terminal (LAUPT) capacity analysis, stakeholder outreach, financial feasibility, public/private partnership, technology transfer, and identification of an Initial Operating Segment (IOS).
- **Phase 2**, Preliminary Engineering, was completed in 2006 for the IOS, and focused on defining the project to prepare preliminary engineering for the purpose of environmental assessment and analysis (EIR/EIS) for public/private investment.
- **Phase 3**, Project Deployment Strategy, was initially done via a consultant study completed in 2007. It focused on an extended IOS with a link to the Ports of Los Angeles and Long Beach. The goal was to provide an initial investment quality analysis necessary to take the deployment program to the private market. The next step in this phase (date to be determined) will include an investment-grade ridership and revenue forecast, operation plans, a detailed financial plan, and creation of a public/private consortium for project deployment.

In December 2002, SCAG's Regional Council approved the deployment of a 54-mile IOS of the HSRT system that would connect West Los Angeles via LAUPT to Ontario Airport. It is a component of a 81-mile corridor between LAX and the San Bernardino Airport. In selecting the IOS, SCAG considered the RTP performance measures, stakeholder support and environmental issues. At the same time, SCAG's Regional Council approved the advance planning of the LAX to Palmdale corridor and Los Angeles to Orange County corridor (Orangeline).

The feasibility studies for the four corridors demonstrated that the HSRT system could be constructed and deployed through a public-private partnership

structure administered through a public agency, a joint powers authority (JPA), a public nonprofit (PNP), or a public-private partnership (PPP) format using a number of innovative and traditional funding mechanisms.

A JPA is in the process of being formed for the express purpose of implementing the IOS (West Los Angeles/LAX to Ontario Airport). Voting members of the yet-to-be-named JPA are the City of Los Angeles, the City of West Covina, and the City of Ontario. SCAG would be one of several non-voting members of the JPA.

TABLE 3.8 2008 RTP REGIONAL HSRT MILESTONES

Milestone	Capital Cost (in nominal dollars, billions)	Implementation Schedule*
IOS: Ontario – West Covina-LA Union Station – West LA/LAX	$19	2020
IOS extension to San Bernardino	$3.5	2020
San Pedro Ports to the IOS	$18	2020
Anaheim - Ontario	$6.7	2020
California High-Speed Train (Union Station - Anaheim)	$4.0**	2020

** Represents the network year for which a project was analyzed for the RTP modeling and regional emissions analysis.*
*** Assumes cost covered by state HSRT Bond Act. State bond revenues for HSRT are not included in the regional revenue forecast.*

Implementation and operation of the HSRT is being proposed on the basis of a business plan approach whereby it will be largely self-financed based on the goods movement, aviation, and commuter operations. The use of public ROW is a critical component of the system as is some level of financial commitment from the public sector. The net performance of the HSRT will be further bolstered by related development in real estate property. A business and institutional structure for the movement of goods, movement of people, and associated development patterns has been developed by SCAG to serve as the basis for implementation of the movement systems.

The HSRT would enhance airport access and connections between regional airports by allowing passengers to bypass the congested highway network. It is envisioned that the HSRT would serve as the basis for a regional airport system and aviation system users would become a key component of HSRT passenger ridership.

Next Steps:

- Prepare preliminary engineering for the Ontario – West Covina-LA Union Station – West LA/LAX IOS for the purpose of preparation of the federal Environmental Impact Statement (EIS) and/or State Environmental Impact Report (EIR) to a level necessary for public/private investment.
- Form a Joint Powers Authority (JPA) for the IOS, and market projects to public/private stakeholders.
- Secure federal, state and local funds to supplement private investment to complete deployment of the IOS and coalesce community support
- Seek legislative support at the regional, State and federal levels for the HSRT deployment.
- Continue working on public-private partnerships (PPP) to fund HSRT projects and to fast-track institutional issues.

Anaheim-Ontario Maglev Segment

The California-Nevada Super Speed Train Commission (CNSSTC) was formed in 1988 to promote the development of, and issue a franchise to build, a superspeed train system connecting Las Vegas with Anaheim and other points in Southern California. In 1991 the Commission selected Transrapid International (TRI) Maglev technology for the corridor.

The critical segment of this route for Southern California is the Anaheim to Ontario Airport link. This would further the airport decentralization strategy for the region and provide a viable transit system to help mitigate transportation congestion/pollution caused by the jobs/housing in-balance between Orange and Riverside Counties.

EXHIBIT 3.7 IOS WITH EXTENSION TO SAN BERNARDINO AND LINK TO SAN PEDRO PORTS

Source: Southern California Association of Governments, ESRI StreetMap USA, Teleatlas

EXHIBIT 3.8 PROPOSED HIGH-SPEED REGIONAL TRANSPORT SYSTEM

Source: Southern California Association of Governments, ESRI StreetMap USA, Teleatlas

According to feasibility study done by CNSSTC in 2000, the Anaheim to Ontario Airport segment will be 32 miles long and take 14.5 minutes with no stops between the two end points and 18 minutes with a station stop mid-route. The capital cost is estimated at $6.7 billion. Annual ridership projections are 13.9 million passengers per year (approximately 38,000 riders per day) with 10 minute headways.

It is not yet determined whether the primary route for this segment will be in the SR-91 corridor or the SR-57. These routes need to be re-examined in future feasibility and planning studies. For modeling purposes, the SR-91 corridor was the selected route.

CNSSTC is seeking funding for future studies and construction of the project from the U.S. federal government.

In 2002, the Western States Maglev Alliance was formed between SCAG and the California-Nevada Super Speed Train Commission and was approved by the Regional Council. As a result of this alliance, the Plan supports continued analysis of the proposed Las Vegas to Anaheim Maglev, especially the segment from Anaheim to Ontario.

California High-Speed Train

Established in 1996, the California High-Speed Rail Authority (CHSRA) is charged with planning, designing, constructing, and operating a high-speed steel wheels on steel rails train system. The financing plan is to pass statewide bonds to pay for the capital infrastructure. The first bond to fund the project is $9.95 billion and is currently on the ballot for November 2008.

The proposed system stretches from San Francisco, Oakland and Sacramento in the north -- with service to the Central Valley -- to Los Angeles and San Diego in the south. With bullet trains operating at speeds up to 220 mph, the express travel time from downtown San Francisco to Los Angeles is just under 2 ½ hours. Intercity travelers (trips between metropolitan regions) along with longer-distance commuters would enjoy the benefits of a system designed to connect with existing rail, air and highway systems.

In the SCAG region there is a planned 210 miles of rail. One line covers 30-miles from Orange County to Union Station and the other from Union Station veering east to Riverside and then down Interstate 15 (I-15) to San Diego. Northbound from Union Station, the route heads through Burbank to Palmdale and then to the Central Valley. If built out, the state system is planned to connect up with SCAG's HSRT system in Palmdale, Union Station and Ontario. Funding ($7 million) to begin a project-specific EIR/EIS in the Union Station to Orange County in the LOSSAN corridor is being provided to CHSRA from OCTA.

SPOTLIGHT ON GOODS MOVEMENT

The goods movement strategies identified in the 2008 RTP merit a focused discussion because of the critical and far-reaching impacts on our region's transportation system, economy, and public health. The goods movement sector of transportation is growing at a tremendous pace and will continue to do so over the timeframe of the RTP. The San Pedro Bay Ports (Port of Los Angeles and the Port of Long Beach) forecast that by 2030, container volume could triple. The productivity gains that are realized by Southern California's geographical advantage and the extraordinary logistics network of ports, warehouses and distribution systems are the primary reasons for this growth.

Cross-border trade activity also contributes to the region's international trade growth. The growth in the manufacturing industry in Mexico has increased truck trips through Calexico East in Imperial County by 77 percent between 1994 and 2005. Also, the Port of Hueneme plays an important role in facilitating the movement of goods. Approximately $7 billion in cargo traverses through the Port annually, and trade-related activity generated by the Port contributes significantly to the local economy.

To continue to provide this critical service, a combination of federal, state, local and private investment is needed. The 2008 RTP calls for approximately $13 billion in freight rail investments, nearly $18 billion in a freight HSRT system, and over $5 billion in highway investments to enable the region to handle the dramatic growth in goods movement. Rail investments consist of

additional mainline capacity, grade separations, and locomotive engine upgrades. About half of the rail-related investments are for highway-rail grade separations, which reduce traffic congestion, improve safety, and reduce pollution. Highway investments include the first phase of a dedicated, toll clean technology truck lane system and truck climbing lanes. Additionally, the proposed alternative technology system for freight includes a shared guideway with passenger vehicles. Service would be operating between passenger intervals, effectively utilizing the available capacity of the system (see Exhibit 3.8).

An essential element of improving the region's goods movement system is reducing its current and long-term impacts on public health and the environment. Accordingly, the 2008 RTP includes investments that integrate air quality mitigation into the goods movement system improvements. Substantial air quality benefits can be realized by accelerating fleet modernization with cleaner technologies.

Further, this Plan maximizes the utilization of the scarce land area near the ports, includes the development of inland port capacity, and has dedicated ground access systems that enable the region to protect communities and meet demand. Specific elements of this Plan are described in the proceeding sections.

PORT ACCESS IMPROVEMENTS

Port access improvements include short-term initiatives to improve access to Terminal Island and to remove bottlenecks to truck movements. They include the replacement of the Gerald Desmond Bridge, SR-47 Truck Expressway/Heim Bridge replacement, I-110/SR-47 Connectors Improvement Program, and the SR-47/Navy Way Interchange. These projects are programmed over the short-term in the 2006 RTIP.

To provide for the landside port access improvements in Imperial County, the 2006 RTIP includes Brawley Bypass project, which is a four lane expressway connecting SR-78 and SR-111. The completion of the project will provide continuity between the California/Baja California border to Riverside County, ensuring smooth and reliable movement of goods through the border.

DEDICATED LANES FOR CLEAN TECHNOLOGY TRUCKS

Over the past several RTP updates, the region has been exploring dedicated truck-lane facilities and continues to refine the concept of such user-supported corridors to improve the flow of goods. More recent effort has focused on adding dedicated truck lanes for clean technology vehicles along truck-intensive corridors in Southern California. Operationally, such a corridor would be aligned to connect freight-intensive locations such as the Ports, warehousing/distribution center locations, and manufacturing locations. These dedicated

EXHIBIT 3.9 DEDICATED LANES FOR CLEAN TECHNOLOGY TRUCKS

Source: Southern California Association of Governments, ESRI StreetMap USA, Teleatlas

facilities would have fewer entrance/egress locations than typical urban interstates to smooth the flow of goods.

This proposal has the potential to relieve many of the negative truck impacts in Southern California such as recurrent delay, pavement deterioration, safety, emissions, and design deficiencies. Dedicated truck lanes would also increase reliability in the freeway system. Despite these benefits, substantial financial constraints as well as environmental impact considerations could hinder project implementation. Recognizing these challenges, the 2008 RTP funds the I-710 segment as the first phase of a comprehensive system that addresses truck-related issues in the region (Exhibit 3.9). This segment includes roughly 78 lane-miles (two lanes in each direction) of dedicated lanes for clean technology trucks along alignments extending from Ocean Blvd in Long Beach to the intermodal railroad yards in Vernon/Commerce. This represents an investment of over $5 billion.

The region's longer term strategic vision would include an east-west corridor and the I-15 freeway, serving strategic distribution centers in Barstow. Major corridor studies have already been completed for I-710, SR-60, and I-15. An EIR/EIS and preliminary engineering are currently underway for I-710. The technical analysis for the 2008 RTP assumes the implementation of dedicated lanes accommodating clean technology vehicles along the I-710 corridor until a preferred alternative is identified by the EIR/EIS.

REGIONAL FREIGHT RAIL INVESTMENT AND EMISSION REDUCTION PACKAGE

Recent projections included in SCAG's *Inland Empire Railroad Main Line Study* suggest that the number of freight trains on most BNSF and UP lines will more than double between 2000 and 2025 in response to a tripling of container volumes at the San Pedro Bay Ports. Passenger train volumes are expected to experience similar volume growth.

The UP and BNSF mainlines east of downtown Los Angeles will reach capacity before the end of the decade and will need to be triple-tracked or even quadruple-tracked in some segments. Investments in the 2008 RTP include $3.2 billion for mainline rail capacity improvements, $6.0 billion to build an estimated 131 highway-rail grade separations east of downtown Los Angeles, and a total of $3.8 billion for accelerating upgrades to cleaner diesel locomotive engines—namely, Tier 4 engines.

In March of 2007, the US Environmental Protection Agency (EPA) proposed new standards to reduce emissions from diesel locomotives: Tier 3 and Tier 4 exhaust emission standards for newly built engines with high-efficiency catalytic after-treatment technology. Tier 3 engines will be available in 2009 and the associated estimated reduction in emissions is less than 50 percent of current conditions. The reduction in emissions from Tier 4 engines is estimated at 90 percent of current conditions. The 2008 RTP assumes nearly $2 billion in federal EPA funding to accelerate the deployment of Tier 4 engines in the region.

Exhibit 3.10 shows planned projects for regional rail capacity enhancement in Southern California. Most of the BNSF system south and west of Colton Crossing will need additional track by 2025, and several of these segments will require additional track as soon as 2010. By 2025 this line will require grade separated crossings at junctions where the two railroads have lines crossing. North of Colton Crossing over the Cajon Pass to Barstow, substantial additional mainline capacity will be needed by 2010 as well as new connections to the system. In the UP system most of the Yuma line will require double tracking by 2025 and the San Gabriel line may require double tracking over major segments during the same time frame. Also by 2025, UP will require several grade separated junctions.

Exhibits 3.11, 3.12, 3.13, and 3.14 show the grade separation projects by county planned in the region. Stakeholder agencies throughout the region have identified priority grade separations that were analyzed in the Inland Empire Railroad Main Line Study and it was determined that without additional grade separations, motor vehicle delay at grade crossings will more than triple between 2000 and 2025. Analysis of vehicle delay from high priority grade separations shows that these could reduce growth in vehicle hours of daily delay (VHDD), cutting delay in half in 2025. This will reduce motor vehicle idling delay and associated idling emissions, and by increasing train speeds, will reduce train emissions through more efficient operations.

ALTERNATIVE TECHNOLOGY-BASED GOODS MOVEMENT/LOGISTICS

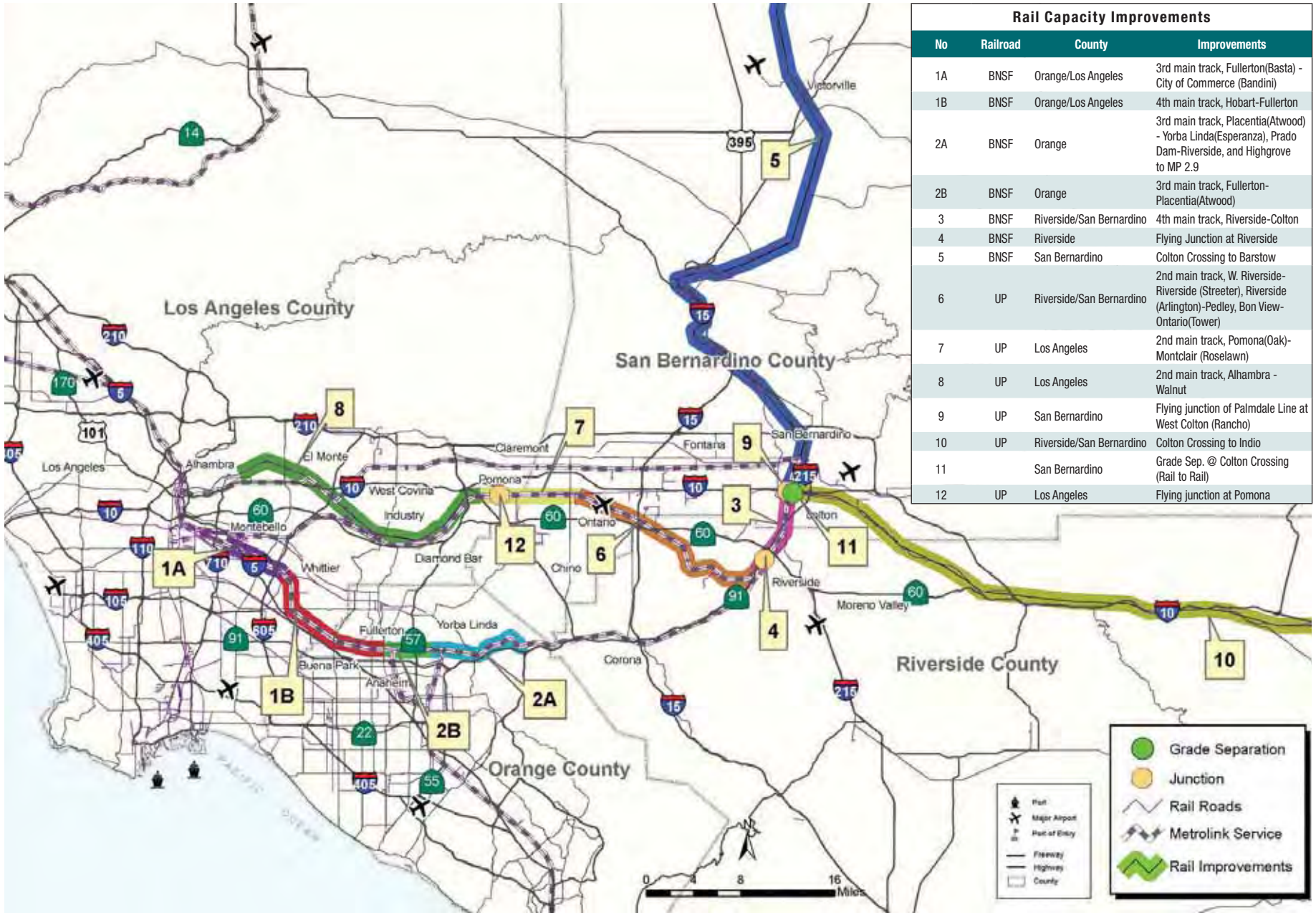
The region is also exploring new alternative technology-based systems that can provide greater throughput and reliability with near zero emissions (the emissions would be only those associated with electricity generation). A recent

TABLE 3.9 SBD CAPACITY SHARED GUIDEWAY WITH PASSENGER SERVICE - 9.2M TEU

Operating Period				Trains/Day/Direction		Potential Capacity				
	Hr/Day	Trains/Hr/Direction		Passenger	Freight	Per Day and Direction				Per Year and Direction
		Passenger	Freight			Passenger	Freight			(24/7 Operation)
							20 ft	40 ft	TEU	TEU
Peak	8	6	6	48	48	42,528	96	1,824	3,744	1,366,560
Off-Peak	10	3	9	30	90	26,580	180	3,420	7,020	2,562,300
Night	2	0	12	0	24	-	48	912	1,872	683,280
Maintenance	4	0	0	0	0	-	-	-	-	-
Total	24	9	27	78	162	69,108	324	6,156	12,636	4,612,140
Total Passengers/Freight in Both Directions						**138,216**	**648**	**12,312**	**25,272**	**9,224,280**

Source: IBI Group

EXHIBIT 3.10 PLANNED PROJECTS FOR REGIONAL RAIL CAPACITY ENHANCEMENT

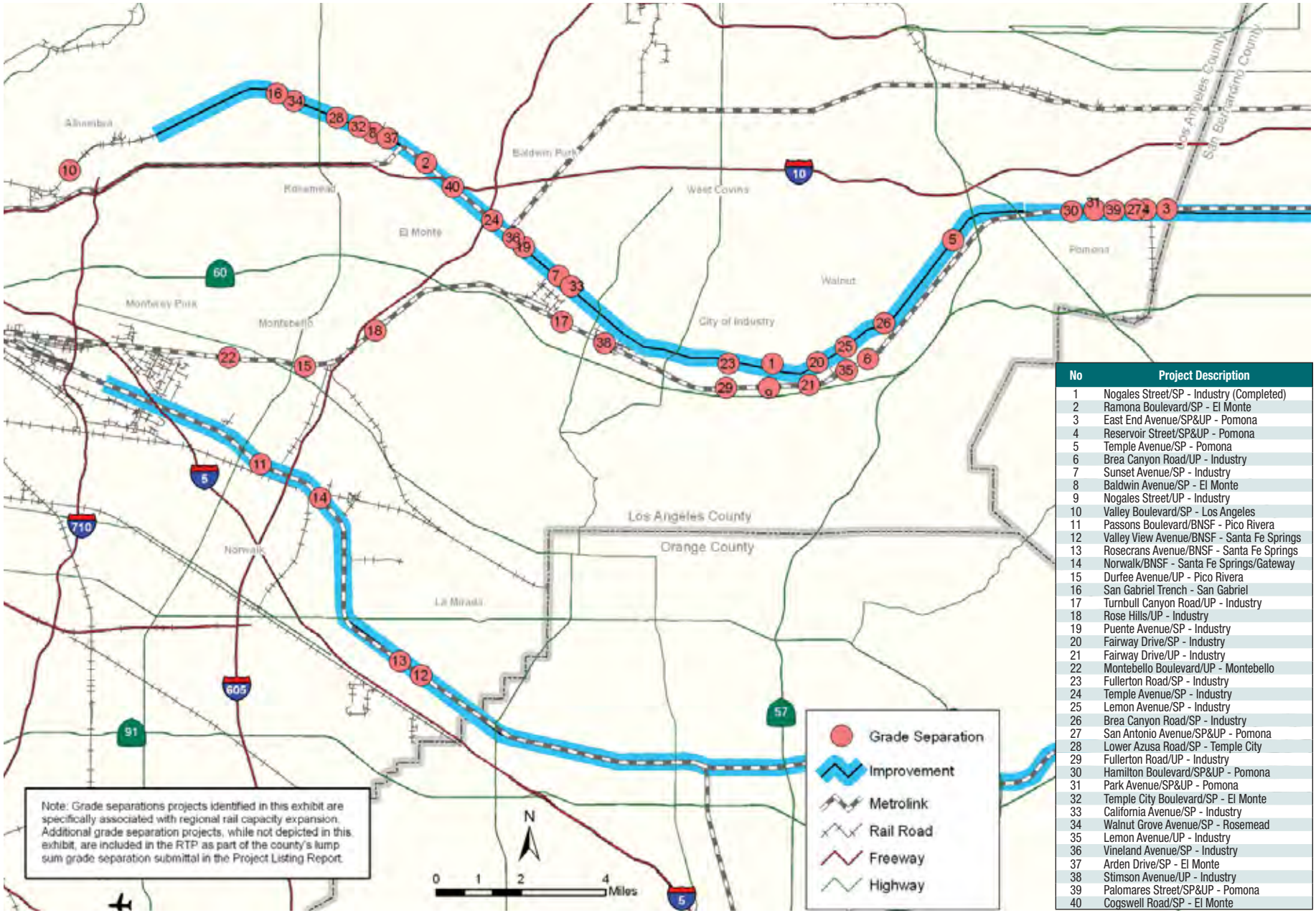


Rail Capacity Improvements

No	Railroad	County	Improvements
1A	BNSF	Orange/Los Angeles	3rd main track, Fullerton(Basta) - City of Commerce (Bandini)
1B	BNSF	Orange/Los Angeles	4th main track, Hobart-Fullerton
2A	BNSF	Orange	3rd main track, Placentia(Atwood) - Yorba Linda(Esperanza), Prado Dam-Riverside, and Highgrove to MP 2.9
2B	BNSF	Orange	3rd main track, Fullerton-Placentia(Atwood)
3	BNSF	Riverside/San Bernardino	4th main track, Riverside-Colton
4	BNSF	Riverside	Flying Junction at Riverside
5	BNSF	San Bernardino	Colton Crossing to Barstow
6	UP	Riverside/San Bernardino	2nd main track, W. Riverside-Riverside (Streeter), Riverside (Arlington)-Pedley, Bon View-Ontario(Tower)
7	UP	Los Angeles	2nd main track, Pomona(Oak)-Montclair (Roselawn)
8	UP	Los Angeles	2nd main track, Alhambra - Walnut
9	UP	San Bernardino	Flying junction of Palmdale Line at West Colton (Rancho)
10	UP	Riverside/San Bernardino	Colton Crossing to Indio
11		San Bernardino	Grade Sep. @ Colton Crossing (Rail to Rail)
12	UP	Los Angeles	Flying junction at Pomona

Source: Southern California Association of Governments, ESRI StreetMap USA, Teleatlas

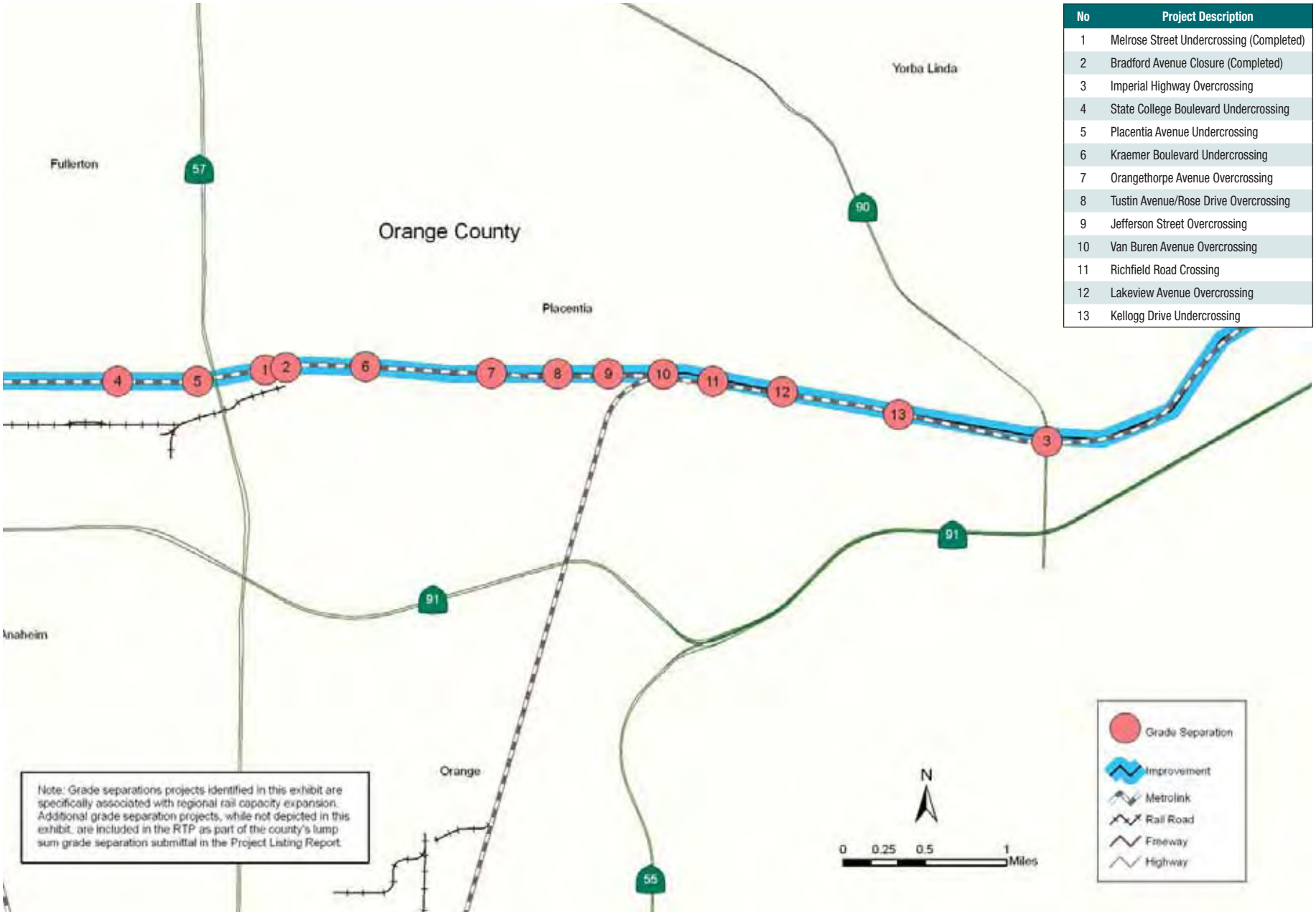
EXHIBIT 3.11 GRADE SEPARATION PROJECTS IN LOS ANGELES COUNTY



No	Project Description
1	Nogales Street/SP - Industry (Completed)
2	Ramona Boulevard/SP - El Monte
3	East End Avenue/SP&UP - Pomona
4	Reservoir Street/SP&UP - Pomona
5	Temple Avenue/SP - Pomona
6	Brea Canyon Road/UP - Industry
7	Sunset Avenue/SP - Industry
8	Baldwin Avenue/SP - El Monte
9	Nogales Street/UP - Industry
10	Valley Boulevard/SP - Los Angeles
11	Passons Boulevard/BNSF - Pico Rivera
12	Valley View Avenue/BNSF - Santa Fe Springs
13	Rosecrans Avenue/BNSF - Santa Fe Springs
14	Norwalk/BNSF - Santa Fe Springs/Gateway
15	Durfee Avenue/UP - Pico Rivera
16	San Gabriel Trench - San Gabriel
17	Turnbull Canyon Road/UP - Industry
18	Rose Hills/UP - Industry
19	Puente Avenue/SP - Industry
20	Fairway Drive/SP - Industry
21	Fairway Drive/UP - Industry
22	Montebello Boulevard/UP - Montebello
23	Fullerton Road/SP - Industry
24	Temple Avenue/SP - Industry
25	Lemon Avenue/SP - Industry
26	Brea Canyon Road/SP - Industry
27	San Antonio Avenue/SP&UP - Pomona
28	Lower Azusa Road/SP - Temple City
29	Fullerton Road/UP - Industry
30	Hamilton Boulevard/SP&UP - Pomona
31	Park Avenue/SP&UP - Pomona
32	Temple City Boulevard/SP - El Monte
33	California Avenue/SP - Industry
34	Walnut Grove Avenue/SP - Rosemead
35	Lemon Avenue/UP - Industry
36	Vineland Avenue/SP - Industry
37	Arden Drive/SP - El Monte
38	Stimson Avenue/UP - Industry
39	Palomares Street/SP&UP - Pomona
40	Cogswell Road/SP - El Monte

Source: Southern California Association of Governments, ESRI StreetMap USA, Teleatlas

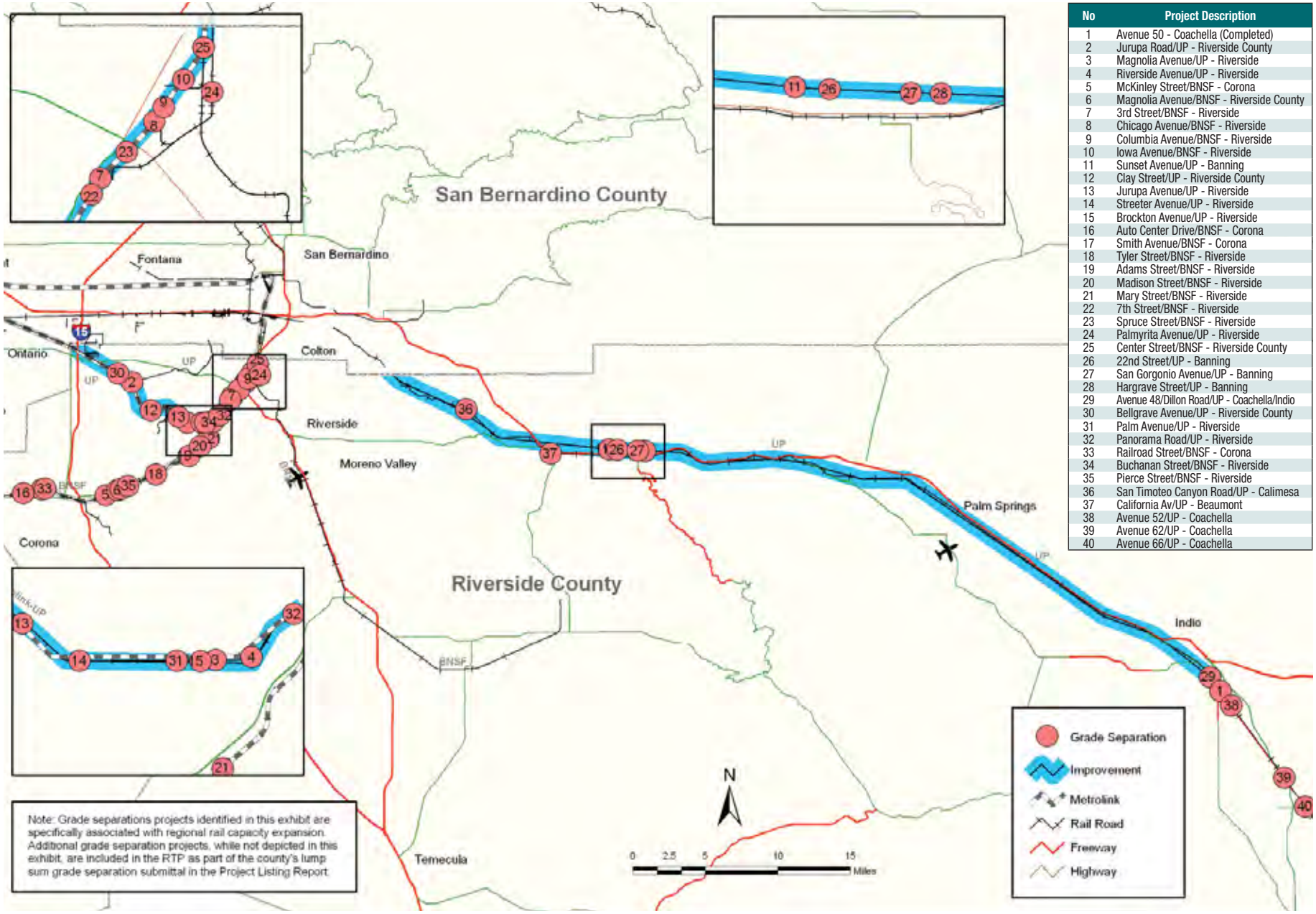
EXHIBIT 3.12 GRADE SEPARATION PROJECTS IN ORANGE COUNTY



No	Project Description
1	Melrose Street Undercrossing (Completed)
2	Bradford Avenue Closure (Completed)
3	Imperial Highway Overcrossing
4	State College Boulevard Undercrossing
5	Placentia Avenue Undercrossing
6	Kraemer Boulevard Undercrossing
7	Orangethorpe Avenue Overcrossing
8	Tustin Avenue/Rose Drive Overcrossing
9	Jefferson Street Overcrossing
10	Van Buren Avenue Overcrossing
11	Richfield Road Crossing
12	Lakeview Avenue Overcrossing
13	Kellogg Drive Undercrossing

Source: Southern California Association of Governments, ESRI StreetMap USA, Teleatlas

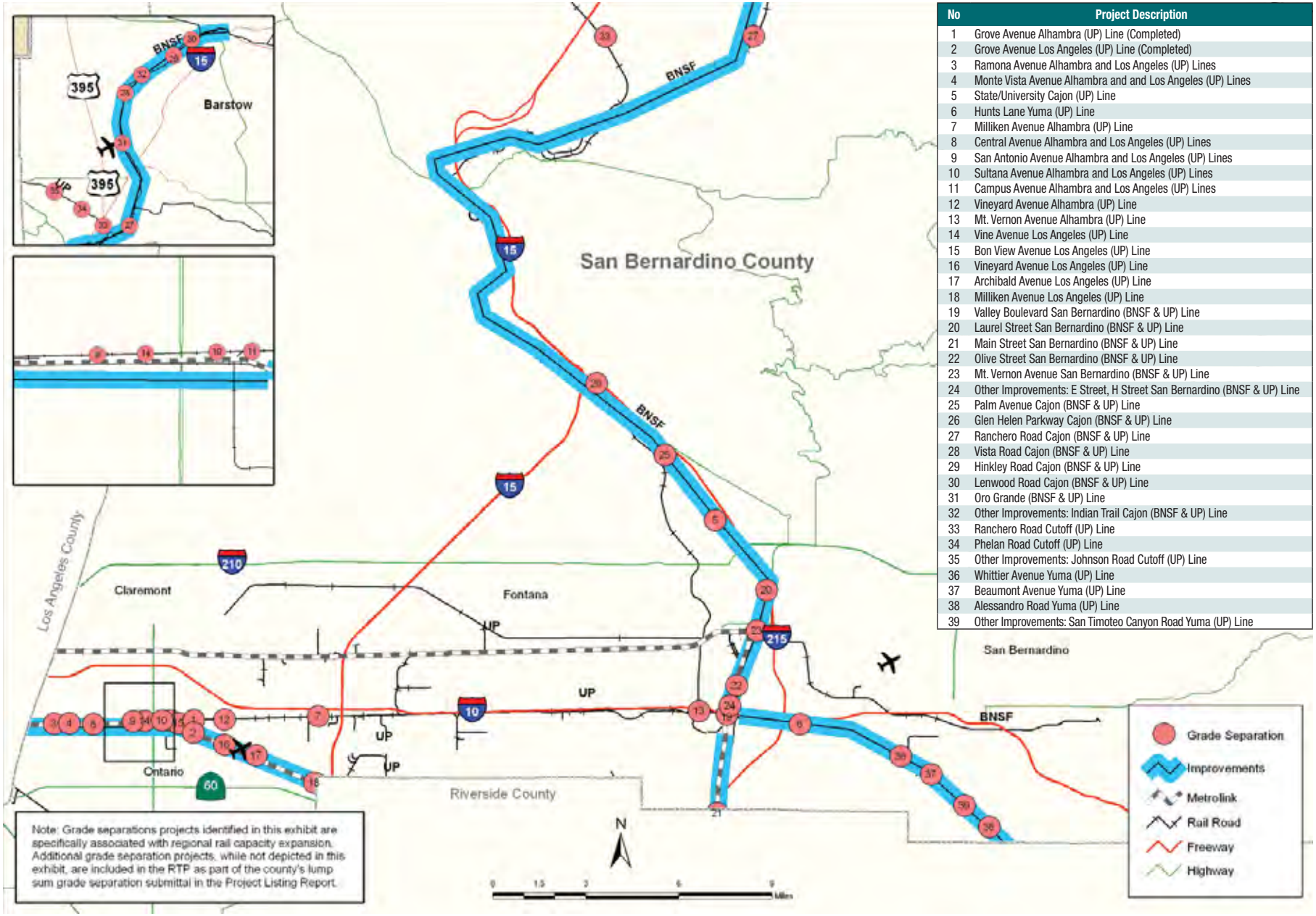
EXHIBIT 3.13 GRADE SEPARATION PROJECTS IN RIVERSIDE COUNTY



No	Project Description
1	Avenue 50 - Coachella (Completed)
2	Jurupa Road/UP - Riverside County
3	Magnolia Avenue/UP - Riverside
4	Riverside Avenue/UP - Riverside
5	McKinley Street/BNSF - Corona
6	Magnolia Avenue/BNSF - Riverside County
7	3rd Street/BNSF - Riverside
8	Chicago Avenue/BNSF - Riverside
9	Columbia Avenue/BNSF - Riverside
10	Iowa Avenue/BNSF - Riverside
11	Sunset Avenue/UP - Banning
12	Clay Street/UP - Riverside County
13	Jurupa Avenue/UP - Riverside
14	Streeter Avenue/UP - Riverside
15	Brockton Avenue/UP - Riverside
16	Auto Center Drive/BNSF - Corona
17	Smith Avenue/BNSF - Corona
18	Tyler Street/BNSF - Riverside
19	Adams Street/BNSF - Riverside
20	Madison Street/BNSF - Riverside
21	Mary Street/BNSF - Riverside
22	7th Street/BNSF - Riverside
23	Spruce Street/BNSF - Riverside
24	Palmyrita Avenue/UP - Riverside
25	Center Street/BNSF - Riverside County
26	22nd Street/UP - Banning
27	San Gorgonio Avenue/UP - Banning
28	Hargrave Street/UP - Banning
29	Avenue 48/Dillon Road/UP - Coachella/Indio
30	Bellgrave Avenue/UP - Riverside County
31	Palm Avenue/UP - Riverside
32	Panorama Road/UP - Riverside
33	Railroad Street/BNSF - Corona
34	Buchanan Street/BNSF - Riverside
35	Pierce Street/BNSF - Riverside
36	San Timoteo Canyon Road/UP - Calimesa
37	California Av/UP - Beaumont
38	Avenue 52/UP - Coachella
39	Avenue 62/UP - Coachella
40	Avenue 66/UP - Coachella

Source: Southern California Association of Governments, ESRI StreetMap USA, Teleatlas

EXHIBIT 3.14 GRADE SEPARATION PROJECTS IN SAN BERNARDINO COUNTY



No	Project Description
1	Grove Avenue Alhambra (UP) Line (Completed)
2	Grove Avenue Los Angeles (UP) Line (Completed)
3	Ramona Avenue Alhambra and Los Angeles (UP) Lines
4	Monte Vista Avenue Alhambra and and Los Angeles (UP) Lines
5	State/University Cajon (UP) Line
6	Hunts Lane Yuma (UP) Line
7	Milliken Avenue Alhambra (UP) Line
8	Central Avenue Alhambra and Los Angeles (UP) Lines
9	San Antonio Avenue Alhambra and Los Angeles (UP) Lines
10	Sultana Avenue Alhambra and Los Angeles (UP) Lines
11	Campus Avenue Alhambra and Los Angeles (UP) Lines
12	Vineyard Avenue Alhambra (UP) Line
13	Mt. Vernon Avenue Alhambra (UP) Line
14	Vine Avenue Los Angeles (UP) Line
15	Bon View Avenue Los Angeles (UP) Line
16	Vineyard Avenue Los Angeles (UP) Line
17	Archibald Avenue Los Angeles (UP) Line
18	Milliken Avenue Los Angeles (UP) Line
19	Valley Boulevard San Bernardino (BNSF & UP) Line
20	Laurel Street San Bernardino (BNSF & UP) Line
21	Main Street San Bernardino (BNSF & UP) Line
22	Olive Street San Bernardino (BNSF & UP) Line
23	Mt. Vernon Avenue San Bernardino (BNSF & UP) Line
24	Other Improvements: E Street, H Street San Bernardino (BNSF & UP) Line
25	Palm Avenue Cajon (BNSF & UP) Line
26	Glen Helen Parkway Cajon (BNSF & UP) Line
27	Ranchero Road Cajon (BNSF & UP) Line
28	Vista Road Cajon (BNSF & UP) Line
29	Hinkley Road Cajon (BNSF & UP) Line
30	Lenwood Road Cajon (BNSF & UP) Line
31	Oro Grande (BNSF & UP) Line
32	Other Improvements: Indian Trail Cajon (BNSF & UP) Line
33	Ranchero Road Cutoff (UP) Line
34	Phelan Road Cutoff (UP) Line
35	Other Improvements: Johnson Road Cutoff (UP) Line
36	Whittier Avenue Yuma (UP) Line
37	Beaumont Avenue Yuma (UP) Line
38	Alessandro Road Yuma (UP) Line
39	Other Improvements: San Timoteo Canyon Road Yuma (UP) Line

Source: Southern California Association of Governments, ESRI StreetMap USA, Teleatlas

analysis carried out by the IBI Group considered the application of an HSRT system for the movement of containers (logistics and systems technology) to and from the San Pedro Bay Ports. This container movement system would provide a high-capacity, fast, and efficient method of moving containerized cargo from the Ports to an inland port facility in San Bernardino. The system capitalizes on the inherent savings of multiple uses on a single infrastructure by operating on shared alignments with the HSRT passenger system. The technology permits operation of HSRT freight vehicles on a shared guideway with passenger vehicles even during peak hour service. Freight vehicle trips can be interspersed with passenger trips while still meeting required passenger vehicle headways. Additionally, full utilization of the freight line can be achieved during the passenger system's off-peak hours. The deployment of the HSRT system would create value in associated components which could in turn contribute to the HSRT's total financial performance.

The connection for the HSRT system would begin at the Ports and join up with the IOS[2] at a point just east of LAUPT. This alignment runs north-south and is assumed to follow a route parallel to the I-710/Alameda Corridor. After connecting to the IOS and other segments, the freight-only service would be interspersed with passenger service.

As Table 3.9 shows, current estimates indicate that the HSRT container movement system is capable of moving over 9.2 million Twenty-Foot Equivalent Units (TEUs) annually. The total freight component is estimated to cost nearly $18 billion in nominal dollars.

For a more detailed discussion of the regional HSRT system and associated documentation on its financial performance, refer to the supplemental HSRT Report. Critical to the implementation of an alternative technology system, such as this HSRT system, the location of inland port facilities and associated costs need to be further evaluated. The development of inland ports served by the system would reduce truck VMT, lower emissions, and encourage efficient patterns of industrial development and land use.

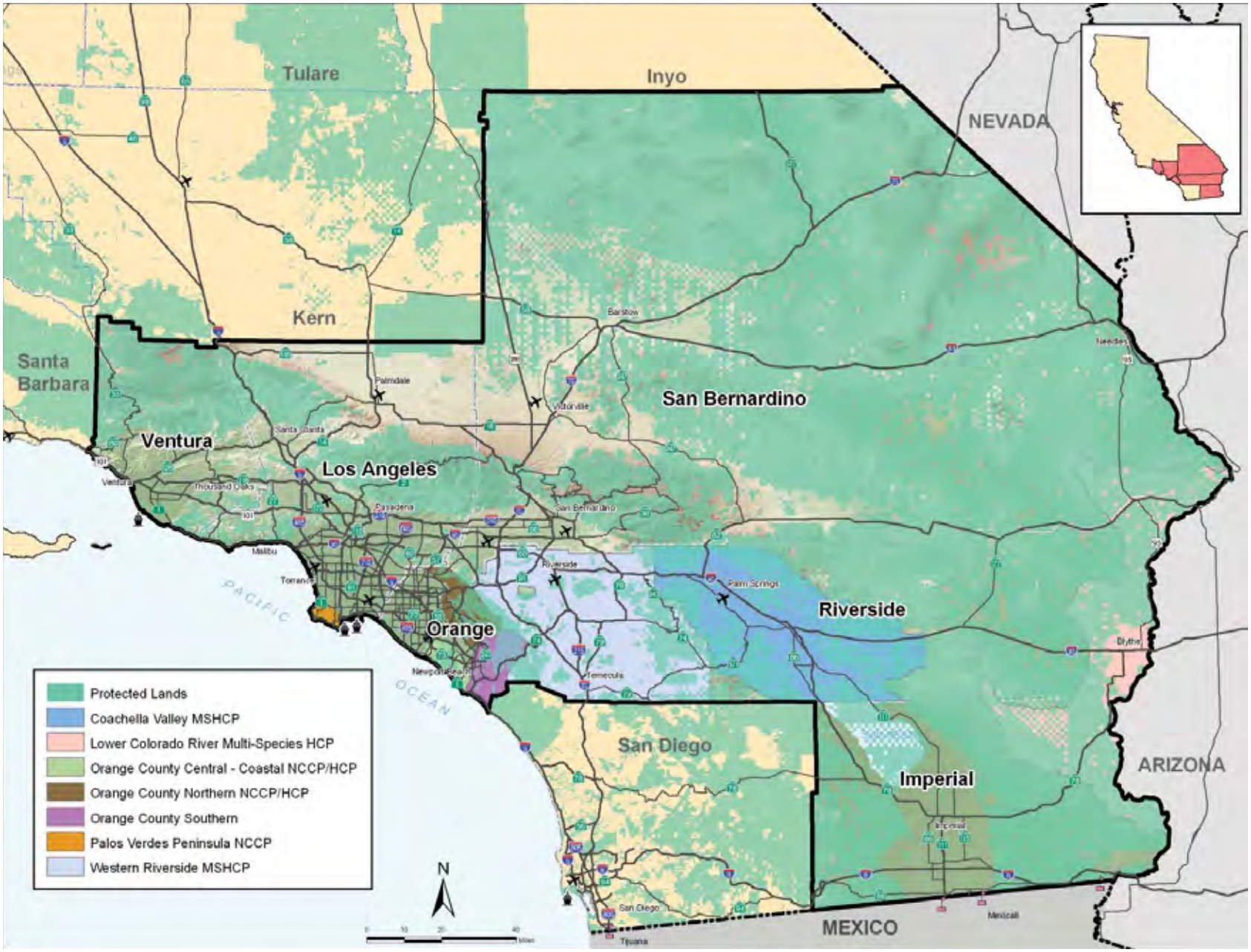
[2] Initial Operating Segment or IOS is discussed in further detail in the supplemental HSRT Report and Appendices.

Mitigating Environmental Impacts

California law requires SCAG to prepare and certify a Program Environmental Impact Report (PEIR) prior to adopting the RTP. The PEIR evaluates the environmental impacts of the RTP and proposes specific measures to mitigate impacts to the maximum extent feasible. Although the 2008 RTP, in and of itself, is a plan to mitigate the transportation related effects of population growth, such as traffic congestion and poor air quality, because the transportation improvements can result in additional growth, the PEIR goes further by recommending additional environmental mitigation at the program level for those resource areas that would be affected by the plan (and associated growth) such as land use, open space, biological resources, water and energy. The section below summarizes the mitigation program. A list of all the mitigation measures included in the 2008 RTP PEIR will be included in the Environmental Mitigation Report of the Final 2008 RTP.

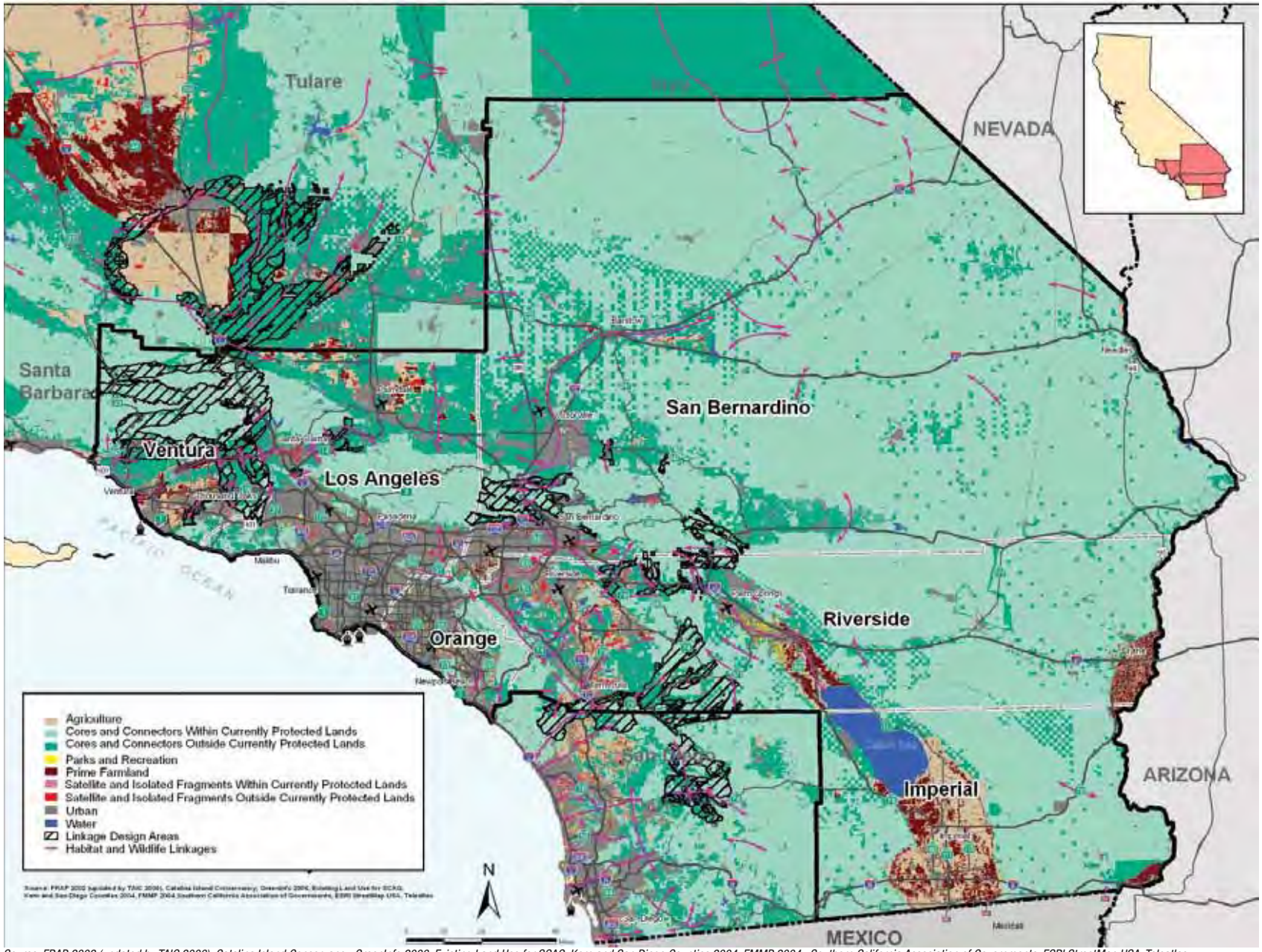
The general purpose of the mitigation measures included in the PEIR and summarized below, is to identify how to protect the environment, improve air quality, and promote energy efficiency in concert with the proposed transportation improvements and related planning. They provide a framework through which implementing agencies and subregions can address the environmental impacts of RTP projects, while implementing RTP goals and policies. The PEIR provides three different types of mitigation measures. The first type can be implemented by SCAG at the regional level. These measures are generally aimed at gathering additional information that can assist in measuring impacts and determining appropriate mitigation and promoting policies that reduce impacts. The second type of measures are to be implemented at the local level by implementing agencies, and individual cities and counties. These measures can strengthen planning documents to ensure for provision of mitigation in the planning process. The third type of measures are project specific and seek to reduce impacts for the myriad different types of projects anticipated in the region. As a programmatic document, many of the measures in the PEIR refer to performance standards because site-specific conditions are not reasonably evaluated at the programmatic level.

EXHIBIT 3.15 PROTECTED LANDS, NATURAL COMMUNITY CONSERVATION PLANS (NCCP) AND HABITAT CONSERVATION PLANS (HCP)



Source: Southern California Association of Governments, ESRI StreetMap USA, Teleatlas, California Legacy Project 2005

FIGURE 3.16 REGIONAL OPEN SPACE INFRASTRUCTURE



Source: FRAP 2002 (updated by TAIC 2006), Catalina Island Conservancy, GreenInfo 2006, Existing Land Use for SCAG, Kern and San Diego Counties 2004, FMMP 2004, Southern California Association of Governments, ESRI StreetMap USA, Teleatlas

Summary of the Environmental Mitigation Program

As required by SAFETEA-LU, the RTP includes an environmental mitigation program that links transportation planning to the environment. Building on its strong commitment to the environment as demonstrated in the 2004 PEIR, SCAG's mitigation program creates an implementation strategy to show varying levels of authority (state, regional, and local). This mitigation discussion also utilizes documents created by the federal agencies to guide environmental planning for transportation projects.

OPEN SPACE

Section 6001(i) of SAFETEA-LU requires that long range transportation plans such as the RTP include a discussion of potential environmental mitigation activities along with potential sites to carry out these activities. As a result of this expanded requirement, SCAG enhanced its Open Space Program to evaluate potential sites to mitigate the impacts associated with transportation activities. The RTP includes two regional scale maps (Figures 3.15 and 3.16) that identify sensitive environmental resources, such as protected lands and sensitive habitats. As part of the open space planning effort undertaken for the Regional Comprehensive Plan, SCAG completed a comprehensive evaluation of open space resources in the region, including Kern and San Diego Counties. SCAG collected GIS data from existing sources to assist with and inform the evaluation of open space planning issues. SCAG then evaluated and analyzed the data to show the distribution of existing open space resources, levels of existing and planning protection and areas of key habitat linkages. Concurrent with this mapping effort, and as required under SAFETEA-LU, SCAG reviewed existing plans and programs to determine which areas were covered by conservation strategies.

According to the Federal Highways Administration, there are more than 3.9 million centerlane miles of public roads that span the United States. Each day, an estimated one million animals are killed on roads, making road kill the greatest human cause of wildlife mortality in the country. The open space program seeks to minimize transportation related impacts on wildlife, and also better integrate transportation infrastructure into the environment.

Locations for Mitigation

Figure 3.15 shows the distribution of protected and unprotected lands within the SCAG region and its vicinity. It also shows the location of county level conservation efforts such as Habitat Conservation Plans (HCPs) and Natural Communities Conservation Plans (NCCPs). Although portions of these areas fall within the "protected" category, large portions of habitat within these areas remain "unprotected" and therefore should still be considered for mitigation activities. Beyond looking at just protected and unprotected lands, SCAG mapped locations of the protected and unprotected areas in relation to wildlife linkages, linkage design areas, park and recreation areas (from SCAG's 2005 land use inventory), agricultural lands, and developed lands. Together, these form the region's open space infrastructure. Exhibits 3.15 and 3.16 demonstrate areas where project sponsors should consider directing mitigation activities. Specifically, those areas that are "unprotected" could be possible locations for mitigation. Although SCAG does not have the authority to purchase or manage lands, conservation of these areas will be achieved through already established programs or through compacts facilitated by SCAG.

Types of Mitigation Activities

The mitigation program of the 2008 RTP generally includes strategies to reduce impacts where transportation and sensitive lands intersect and also encourages smart land use strategies that maximize the existing system and eliminate the need for new facilities that might impact open space and habitat. Potential mitigation programs include better planning of transportation projects to avoid or lessen impacts to open space, recreation land, and agricultural lands through information and data sharing, increasing density in developed areas, and minimizing development in previously undeveloped areas that may contain important open space.

The mitigation program also emphasizes the importance of integrating consideration of wildlife and habitat into the design of transportation facilities in those areas where impacts cannot be avoided. SCAG encourages project sponsors to review Ventura County's Wildlife Crossing Guidelines and FHWA's Critter Crossings. Both documents provide examples of context sensitive solutions (CSS) which is a way of involving all stakeholders to develop a transportation facilities that fit their physical setting and preserve scenic, aesthetic, historic and environmental resources, while maintaining safety and mobility. CSS is an approach that considers the total context within which a transportation improvement project will exist. CSS principles include the employment of early, continuous, and meaningful involvement of the public and all stakeholders throughout the project development process. Additional information on CSS is available on FHWA's website at:http://www,fhwa.dot.gov/csd

In summary, the open space mitigation programs include the following types of measures:

- Identifying open space areas that can be preserved and developing mitigation measures such as mitigation banking, transfer of development rights (for agricultural lands), and payment of in lieu fees
- Updating General Plan information from cities to provide the most recent land use data to the region
- Coordinating with cities and counties to implement growth strategies that maximize the existing transportation network
- Evaluating project alternatives and alternative route alignments where projects intersect with sensitive habitats
- Integrating the planning of transportation facilities with context sensitive design elements such as wildlife crossings

ENERGY

As the region continues to add more people, households and jobs, the demand for energy will continue to grow. Every day, the SCAG region consumes over 23 million gallons of oil and SCAG's vehicle fuel consumption has increased 20 percent over the last ten years.[3] In the face of this growth in energy demand and concerns about future oil supplies, there is the mounting realization that we are living in an energy constrained world. As such, the 2008 RTP includes strategies to reduce Vehicle Miles Traveled (VMT) and as a result, per capita energy consumption from the transportation sector. The PEIR also includes mitigation measures relating to energy designed to reduce

[3] California Department of Transportation, Division of Transportation System Information. (December 2006). California Motor Vehicle Stock, Travel and Fuel Forecast.

consumption and increase the use and availability of renewable sources of energy in the region.

The mitigation program in the PEIR generally includes opportunities to reduce petroleum vehicle fuel consumption and increase energy efficiency in the region. Potential mitigation programs include coordinating transportation, land use and air quality planning to reduce VMT, energy use and greenhouse gas emissions as well as increasing automobile fuel efficiency and construction of infrastructure to accommodate increased use of motor vehicles powered by alternative fuels. In California, efforts are underway to reduce petroleum use, reduce emissions from light-duty vehicles, reduce the carbon intensity of fuels, improve transportation energy efficiency, and encourage smart land use and intelligent transportation strategies.

In addition to transportation strategies, building design and housing types also have a strong relationship to energy use and efficiency. The mitigation program generally includes energy efficient building practices, smarter land use planning with a focus on access to public transportation, and participation in energy efficiency incentive programs. All publicly owned utilities and most municipal owned utilities that provide electric or natural gas service also administer energy conservation programs. These programs typically include home energy audits; incentives for replacement of existing appliances with new, energy-efficient models; provision of resources to inform businesses on development and operation of energy-efficient buildings.

In summary, the energy mitigation program includes the following types of measures:

- Considering best practices and technological improvements that can reduce the consumption of fossil fuels such as modernizing older engines and equipment
- Developing programs to reduce single-occupancy vehicle trips such as telecommuting, ridesharing, alternative work schedules, and parking cash-out (offering employees a cash allowance in lieu of a parking space)
- Creating communities where people live closer to work, bike, walk, and take transit as a substitute for personal auto travel
- Integrating green building measures into project design and zoning such as those identified in the U.S. Green Building Council's Leadership in Energy and Environmental Design, Energy Star Homes, Green Point Rated Homes, and the California Green Builder Program

As stated above, energy experts have suggested that there is a potential for energy demand to exceed supply. Recommendations to reduce energy consumption are included in the EIR as mitigation measures. Over the next RTP planning cycle, as technology evolves, SCAG will continue to refine recommendations to reduce regional energy consumption.

AIR QUALITY AND CLIMATE CHANGE

The 2008 RTP includes programs, policies and measures to address air emissions including greenhouse gases. Measures that help mitigate air emissions, including GHG emissions, are comprised of strategies that reduce congestion, increase access to public transportation, improve air quality, and enhance coordination between land use and transportation decisions. SCAG's vision includes the introduction of a high-speed, high performance regional transport system that may potentially reduce airport and freeway congestion and provide an alternative to the single-occupancy automobile. In order to disclose potential environmental effects of the RTP, SCAG has prepared an estimated inventory of the region's existing GHG emissions, identified mitigation measures, and compared alternatives in the PEIR. The mitigation measures seek to achieve the maximum feasible and cost-effective reductions in emissions. There are difficulties in quantifying reductions in GHG emissions due to insufficient data. During the next RTP cycle, SCAG will focus on refining techniques to better estimate emission reductions associated with identified mitigation measures.

The air quality mitigation program includes, but is not limited to, the following types of measures:

- ARB measures that set new on-road and off-road engine standard and accelerate turnover of higher emitting engines from in-use fleet;
- Project specific measure to reduce impacts from construction activities such as the use of water and dust suppressants and restrictions on trucks hauling dirt, sand and soil.
- Encouragement of green construction techniques such as using the minimum amounts of GHG emitting construction equipment; and
- Incorporating planting of shade trees into construction projects where feasible

In addition, the RTP includes Transportation Control Measures (TCMs), which are those projects that reduce congestion and improve air quality in the region.

TRANSPORTATION

The 2035 transportation model takes in to account the population, households, and employment projected for 2035, and therefore the largest demand on the transportation system expected during the lifetime of the 2008 RTP. In accounting for the effects of regional population growth, the model output provides a regional, long-term and cumulative level of analysis for the impacts of the 2008 RTP on transportation resources. The regional growth and thus cumulative impacts are captured in the VMT, VHT, and heavy-duty truck VHT data.

Implementation of the 2008 RTP would include implementation of a series of projects which are described in the Regional Transportation Plan. The 2035 transportation system performance is compared to the performance of the existing (2008) system for the purpose of determining the significance of impacts.

The transportation mitigation program includes the following types of measures:

- Increasing rideshare and work-at-home opportunities to reduce demand on the transportation system
- Investments in non-motorized transportation and maximizing the benefits of the land use-transportation connection
- Travel Demand Management (TDM) measures
- Goods movement capacity enhancements
- Key transportation investments targeted to reduce heavy-duty truck delay

POPULATION AND HOUSING

Transportation projects including new and expanded infrastructure are necessary to improve travel time and can enhance quality of life for those traveling throughout the region. However, these projects also have the potential to induce population growth in certain areas of the region. Although SCAG does not anticipate that the RTP would affect the total growth in population in the region, the RTP has the ability to affect the distribution of that growth. In addition to induced population growth transportation projects in the RTP

also have the potential to divide established communities, primarily through acquisition of rights-of-way.

The population and housing mitigation program includes the following types of measures:

- Develop advisory land use policies and strategies that utilize the existing transportation network and enhance mobility while reducing land consumption
- Require project implementation agencies to provide relocation assistance, as required by law, for residences and businesses displaced
- Require project implementation agencies to design new transportation facilities that consider existing communities

LAND USE

The 2008 RTP contains transportation projects to help more efficiently distribute population, housing, and employment growth. These transportation projects are generally consistent with the county and regional level general plan data available to SCAG. However, general plans are not updated consistently. In addition, the RTP's horizon year of 2035 is beyond the timeline of even the most recent general plans.

The land use mitigation program includes the following types of measures:

- Encourage cities and counties to update their general plans and provide the most recent plans to SCAG
- Work with member cities to ensure that transportation projects are consistent with the RTP and general plans
- Work with cities and counties to ensure general plans reflect RTP policies

AESTHETICS

The SCAG region includes several highway segments that are recognized by the State of California as designated scenic highways or are eligible for such designation. Construction and implementation of projects in the RTP could impact designated scenic highways, restrict or obstruct views of scenic resources such as mountains, ocean, rock outcroppings, etc. In addition, some transportation projects could add urban visual elements, such as transportation infrastructure (highways, transit stations) to previously natural areas.

In summary, the aesthetics mitigation program includes the following types of measures:

- Require project implementation agencies to implement design guidelines to protect views of scenic corridors
- Require project implementation agencies to use construction screens and barriers that complement the existing landscape
- Require project implementation agencies to complete design studies for projects in designated or eligible scenic highways
- In visually sensitive areas, require local land use agencies to apply development standards and guidelines that maintain compatibility

PUBLIC SERVICES

Impacts to public services from the 2008 RTP generally include additional demands on fire and police services, schools and landfills. Additional police and fire personnel would be needed to adequately respond to emergencies and routine calls, particularly on new or expanded transportation facilities. The 2008 RTP's influence on growth could contribute to impacts on public schools, requiring additional teachers and educational facilities. Additional population growth could result in a greater demand for solid waste disposal facilities. Furthermore, collecting solid waste and transporting it to an available disposal facility would impact roads and railways.

In summary, the public services mitigation program includes the following types of measures:

- Requiring the project implementation agencies to identify police protection, fire service, emergency medical service, waste collection and public school needs and coordinate with local officials to ensure that the existing public services would be able to handle the increase in demand for their services
- Requiring the project implementation agencies to identify the locations of existing utility lines and avoid all known utility lines during construction
- Encouraging green building measures to reduce waste generation and reduce the amount of waste sent to landfills
- Encouraging the use of fire-resistant materials and vegetation when constructing projects in areas with high fire threat

BIOLOGICAL RESOURCES

Impacts to biological resources generally include displacement of native vegetation and habitat on previously undisturbed land, habitat fragmentation and decrease in habitat connectivity, and displacement and reduction of local, native wildlife including sensitive species. Building new transportation routes and facilities through undisturbed land or expanding facilities and increasing the number of vehicles traveling on existing routes will directly injure wildlife species, cause wildlife fatalities, disturb natural behaviors such as, breeding and nesting. This will result in the direct reduction or elimination to species populations (including sensitive and special-status species) and native vegetation (including special status species and natural communities) as well as the disruption and impairment of ecosystem services provided by native habitat areas.

The biological resources mitigation program includes the following types of measures:

- Planning transportation routes to avoid/minimize removal of native vegetation, displacement of wildlife, and impacts to regionally and locally significant habitat types such as, oak woodlands, vernal pools, estuaries, lagoons, and other riparian areas
- Including provisions for habitat enhancement such as mitigation banking, improving/retaining habitat linkages, preserving wildlife corridors and wildlife crossings to minimize the impact of transportation projects on wildlife species and habitat fragmentation
- Conducting appropriate surveys to ensure no sensitive species' habitat or special status natural communities is unnecessarily destroyed
- Avoiding and minimizing impacts to wildlife activities (such as breeding, nesting, and other behaviors) during construction of the project by avoiding construction during critical life stages or sensitive seasons
- Avoiding and minimizing impacts to habitat during project construction through actions such as, fencing off sensitive habitat, minimizing vehicular accessibility, and salvaging native vegetation and topsoil
- Minimizing further impacts to wildlife and their habitat after project construction by replanting disturbed areas, providing vegetation buffers at heavily trafficked transportation facilities, and restoring local, native vegetation

GEOLOGY, SOILS, AND SEISMICITY

Impacts to geological resources generally include the disturbance of unstable geologic units (rock type) or soils causing the loss of topsoil and soil erosion, slope failure, subsidence, project-induced seismic activity and structural damage from expansive soils. These activities, in addition to building projects on and around Alquist-Priolo Fault Zones and other local faults, could expose people and/or structures to the risk of loss, injury, or death.

The geological mitigation program includes the following types of measures:

- Employing appropriate grading, construction practices, siting, and design standards, such as adherence to the California Building Code and State of California design standards
- Obtaining site-specific geotechnical data from qualified geotechnical experts
- Complying with all relevant local, state, and federal construction and design requirements for structures located on or across Alquist-Priolo Fault Zones and other local faults

CULTURAL RESOURCES

Impacts to cultural resources generally include substantial adverse changes to historical and archaeological resources and direct or indirect changes to unique paleontological resources or sites or unique geological features. Adverse changes include the destruction of culturally and historically (recent or geologic time) significant and unique historical, archaeological, paleontological, and geological features.

The cultural resources mitigation program includes the following types of measures:

- Obtain consultations from qualified cultural and paleontological resource experts to identify the need for surveys and preservation of important historical, archaeological, and paleontological resources
- Implementing design and siting measures that avoid disturbance of cultural and paleontological resource areas, such as creating visual buffers/landscaping or capping/filling the site to preserve the contextual setting of the resource
- Monitoring construction activity in areas with moderate to high potential to support paleontological resources and overseeing salvage operations of paleontological resources
- Consulting local tribes and the Native American Heritage Commission for project impacts to sacred lands and burial sites

WATER RESOURCES

Impacts to water resources from the 2008 RTP include potential water quality impairment from increased impervious surfaces. Increased impervious surfaces in water recharge areas potentially impact groundwater recharge, and groundwater quality. Cumulative impacts from the projected growth induced by the RTP include increased impervious surface, increased development in alluvial fan floodplains, and increased water demand and associated impacts, such as drawdown of groundwater aquifers. Increased output of greenhouse gasses from the region's transportation system impacts the security and reliability of the imported water supply.

The water resources mitigation program includes the following types of measures:

- Utilizing advanced water capture and filtration techniques, showing a preference for naturalized systems and designs, to control stormwater at the source
- Avoiding any new construction of impervious surfaces in non-urbanized areas, such as wetlands, habitat areas, parks, and near river systems
- Avoiding any new construction that provides access to flood-prone areas, such as in alluvial fans and slide zones
- Protection and preservation of existing natural flood control systems, such as wetlands and riparian buffers, and expansion of such systems in areas where they do not currently exist
- Constructing projects according to Best Management Practices for water quality protection and water conservation, including Low Impact Development and green building standards

- Coordinating project development and construction efforts across jurisdictional, agency, and departmental boundaries, to increase project benefits

HAZARDOUS MATERIALS

Implementation of the 2008 RTP would affect the transportation and handling of hazardous materials in the SCAG region. Expected significant impacts include risk of accidental releases due to an increase in the transportation of hazardous materials and the potential for such releases to reach neighborhood and communities adjacent to transportation facilities.

The hazardous materials mitigation program aims to minimize the significant hazard to the public or the environment that involves the release of hazardous materials into the environment. Potential mitigation programs include active coordination with regulatory agencies and first responders in order to ensure proper handling and transport of hazardous materials and their containers. Mitigation measures also involve ensuring that the project implementation agency comply with all applicable laws, regulations, and health and safety standards set forth by federal, state, and local authorities that regulate the proper handling of such materials and their containers to the routine transport, use, and disposal of hazardous materials does not create a significant hazard to the public or the environment.

The hazardous materials mitigation programs include the following types of measures:

- Coordinating with regulatory agencies and first responders in order to continue to govern goods movement and hazardous materials transportation throughout the region
- Considering existing and known planned school locations when determining the alignment of new transportation projects and modifications to existing transportation facilities
- Encouraging project sponsors to consider published lists of contaminated properties, which are continually updated, in order to identify cases where new development -would involve the disturbance of contaminated properties
- Developing appropriate mitigation measures to assure that worker and public exposure is minimized to an acceptable level and to prevent any further environmental contamination as a result of construction
- Ensuring that project implementation agencies comply with all applicable laws, regulations, and health and safety standards set forth by federal, state, and local authorities that regulate the proper handling of such materials and their containers to the routine transport, use, and disposal of hazardous materials does not create a significant hazard to the public or the environment

SAFETY AND SECURITY

The SCAG region is vulnerable to numerous threats that include both natural and human-caused incidents. A large scale evacuation would be difficult in the SCAG region. Impacts to safety and security resulting from the 2008 RTP include: 1) impairment to transportation safety, security, and reliability for all people and goods in the region; 2) prohibiting the prevention, protection, response to, and recovery from major human-caused or natural events that would create a significant hazard to the public threatening and impacting lives, property, the transportation network and the regional; and 3) exposure of people or structures to a significant risk of loss, injury or death involving wildland fires. As such, the mitigation programs for Safety and Security in the 2008 RTP aims for extensive coordination, collaboration and flexibility among all of the agencies and organizations involved in planning, mitigation, response and recovery.

The Safety and Security mitigation programs include the following types of measures:

- Continuing deployment and promotion of intelligent transportation system technologies that enhance transportation security
- Establishing transportation infrastructure practices that promote and enhance security
- Establishing a forum where policy makers can be educated and regional policy can be developed
- Helping to enhance the region's ability to deter and respond to terrorist incidents, human-caused or natural disasters by strengthening relationship and coordination with transportation agencies
- Working to enhance emergency preparedness awareness among public agencies and with the public at large

NOISE

Some of the principal noise generators within the SCAG region are associated with transportation (i.e., airports, freeways, arterial roadways, seaports, and railroads). Additional noise generators include stationary sources, such as industrial manufacturing plants and construction sites. Noise impacts resulting from the 2008 RTP generally include exposure of sensitive receptors to noise in excess of normally acceptable noise levels or substantial increases in noise as a result of the operation of expanded or new transportation facilities. As such, the noise mitigation program includes mitigation measures designed to minimize the impact of noise on sensitive receptors as a result of the implementation of the 2008 RTP.

These mitigation measures include ensuring that project implementing agencies comply with all local sound control and noise level rules, regulations, and ordinances; utilizing the best available noise control techniques (including mufflers, intake silencers, ducts, engine enclosures and acoustically attenuating shields or shrouds) in order to minimize construction noise impacts; and utilizing land use planning measures, such as zoning, restrictions, on developments, buffers, etc., to minimize exposure to sensitive receptors.

The noise mitigation programs include the following types of measures:

- Encouraging project implementing agencies to comply with all local sound control and noise level rules, regulations, and ordinances
- Developing the best available noise control techniques in order to minimize construction noise impacts
- Conduct a project specific noise evaluation as part of the appropriate environmental review of each project
- Encourage project implementation agencies to maximize the distance between noise-sensitive land uses and new roadway lanes, roadways, rail, transit centers, park-and-ride lots, and other new noise-generating facilities