A partnership between the Federal Highway Administration and the Southern California Association of Governments

ASSESSING SUSTAINABLE PLANNING IN SOUTHERN CALIFORNIA

EVALUATING THE 2012 RTP/SCS WITH INVEST

A partnership between the Federal Highway Administration and the Southern California Association of Governments
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Executive Summary

Background

As the designated metropolitan planning organization (MPO) for the six Southern California counties of Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura, the Southern California Association of Governments (SCAG) is responsible for managing, monitoring, and updating a long-range vision of the regional transportation system at least once every four years. As the nation’s largest MPO, SCAG faces many challenges in developing regional long-range strategies that are environmentally sustainable, socially equitable, economically sound, and also meet the mobility and accessibility needs of its residents.

For decades prior to 2012, SCAG had addressed these challenges by preparing Regional Transportation Plans (RTPs) with a primary focus on improving mobility and air quality for the region’s residents and visitors. While mobility and air quality are vital components of quality of life, they are by no means the only ones. Partly encouraged by California’s Sustainable Communities and Climate Protection Act - State Senate Bill 375 (SB 375), which requires that MPOs in California reduce greenhouse gas (GHG) emissions from cars and light trucks by target levels set by the state, SCAG began to take a comprehensive approach to regional planning by broadening the regional goal to incorporate sustainability and improve the quality of life in general. As a result, SCAG developed the 2012 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), which achieves emission reductions of 9 percent per capita in 2020 and 16 percent per capita in 2035, surpassing both targets set by the state of 8 and 13 percent for the years 2020 and 2035, respectively.

The 2012 RTP/SCS proposes that the region follow a system management approach that aims to protect and maximize the productivity of existing transportation infrastructure before considering strategic expansion. This approach recognizes that the region can no longer afford to rely on system expansion alone to address its mobility and sustainability needs of the growing population. Rather, an integrated approach is needed, based upon comprehensive system monitoring and evaluation and the use of performance measures to ensure that the best-performing projects and strategies are included in the RTP/SCS.

Guided by this framework, the 2012 RTP/SCS commits $525 billion to improving and expanding the region’s multi-modal system in a balanced and sustainable manner. Table E-1 provides a breakdown of these expenditures.
### TABLE E-1. 2012 RTP/SCS INVESTMENTS

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Transit</strong></td>
<td></td>
<td>$55.0 billion</td>
</tr>
<tr>
<td>Bus Rapid Transit (BRT)</td>
<td>New BRT routes, extensions, and/or service enhancements in Los Angeles, Orange, Riverside, San Bernardino, and Ventura Counties</td>
<td>$4.6 billion</td>
</tr>
<tr>
<td>Light Rail Transit (LRT)</td>
<td>New Light Rail routes/extensions in Los Angeles and San Bernardino Counties</td>
<td>$16.9 billion</td>
</tr>
<tr>
<td>Heavy Rail Transit (HRT)</td>
<td>Heavy Rail extension in Los Angeles County</td>
<td>$11.8 billion</td>
</tr>
<tr>
<td>Bus</td>
<td>New and expanded bus service in Los Angeles, Orange, Riverside, San Bernardino, and Ventura Counties</td>
<td>$21.7 billion</td>
</tr>
<tr>
<td><strong>Passenger and High-Speed Rail</strong></td>
<td></td>
<td>$51.8 billion</td>
</tr>
<tr>
<td>Commuter Rail</td>
<td>Metrolink extensions in Riverside County and Metrolink systemwide improvements to provide higher speeds</td>
<td>$4.1 billion</td>
</tr>
<tr>
<td>High-Speed Rail</td>
<td>Improvements to the Los Angeles to San Diego (LOSSAN) Rail Corridor with an ultimate goal of providing San Diego-Los Angeles express service in under two hours. Phase I of the California High-Speed Train (HST) project that would provide high-speed service from Los Angeles to the Antelope Valley</td>
<td>$47.7 billion</td>
</tr>
<tr>
<td><strong>Active Transportation</strong></td>
<td></td>
<td>$6.7 billion</td>
</tr>
<tr>
<td>Various Active Transportation Strategies</td>
<td>Increase our bikeways from 4,315 miles to 10,122 miles, bring significant amount of sidewalks into compliance with the Americans with Disabilities Act (ADA), safety improvements, and various other strategies</td>
<td>$6.7 billion</td>
</tr>
<tr>
<td><strong>Transportation Demand Management (TDM)</strong></td>
<td></td>
<td>$4.5 billion</td>
</tr>
</tbody>
</table>
| Various TDM Strategies | Strategies to incentivize drivers to reduce solo driving:  
  - Increase carpooling and vanpooling  
  - Increase the use of transit, bicycling, and walking  
  - Redistribute vehicle trips from peak periods to non-peak periods by shifting work times/days/locations  
  - Encourage greater use of telecommuting  
  - Other “first mile/last mile” strategies to allow travelers to easily connect to and from transit service at their origin and destination. These strategies include the development of mobility hubs around major transit stations, the integration of bicycling and transit through folding-bikes-on-buses programs, triple bike racks on buses, and dedicated racks on light and heavy rail vehicles | $4.5 billion |
<p>| <strong>Transportation Systems Management (TSM) (includes Intelligent Transportation Systems (ITS))</strong> | | $7.6 billion |
| Various TSM Strategies | Enhanced incident management, advanced ramp metering, traffic signal synchronization, advanced traveler information, improved data collection, universal transit fare cards (Smart Cards), and Transit Automatic Vehicle Location (AVL) to increase traffic flow and reduce congestion | $7.6 billion |
| <strong>Highways</strong> | | $64.2 billion |
| Mixed Flow | Interchange improvements to and closures of critical gaps in the highway network to provide access to all parts of the region | $16.0 billion |
| High-Occupancy Vehicle (HOV)/High-Occupancy Toll (HOT) | Closure of gaps in the high-occupancy vehicle (HOV) lane network and the addition of freeway-to-freeway direct HOV connectors to complete Southern California’s HOV network. A connected network of Express/HOT lanes | $20.9 billion |</p>
<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toll Facilities</td>
<td>Closure of critical gaps in the highway network to provide access to all parts of the region</td>
<td>$27.3 billion</td>
</tr>
<tr>
<td>Arterials</td>
<td></td>
<td>$22.1 billion</td>
</tr>
<tr>
<td>Various Arterial Improvements</td>
<td>Spot widenings, signal prioritization, driveway consolidations and relocations, grade separations at high-volume intersections, new bicycle lanes, and other design features such as lighting, landscaping, and modified roadway, parking, and sidewalk widths</td>
<td>$22.1 billion</td>
</tr>
<tr>
<td>Goods Movement (includes Grade Separations)</td>
<td>Port access improvements, freight rail enhancements, grade separations, truck mobility improvements, intermodal facilities, and emission-reduction strategies</td>
<td>$48.4 billion</td>
</tr>
<tr>
<td>Aviation and Airport Ground Access</td>
<td>Rail extensions and improvements to provide easier access to airports, and new express bus service from remote terminals to airports</td>
<td>Included in modal investments</td>
</tr>
<tr>
<td>Operations and Maintenance</td>
<td></td>
<td>$216.9 billion</td>
</tr>
<tr>
<td>Transit</td>
<td>Operations and maintenance to preserve our multimodal system in a good state of repair</td>
<td>$139.3 billion</td>
</tr>
<tr>
<td>Highways</td>
<td></td>
<td>$56.7 billion</td>
</tr>
<tr>
<td>Arterials</td>
<td></td>
<td>$20.9 billion</td>
</tr>
</tbody>
</table>

**FHWA’s Focus on Sustainability: INVEST**

Improving the sustainability of the transportation system is a national priority for FHWA, and the application of the INVEST tool is intended to support this national goal. The Sustainable Highways Initiative was developed to support various activities conducted across FHWA to facilitate balanced decision-making among environmental, economic, and social values—the triple bottom line of sustainability. As part of its focus on sustainability, in 2012, FHWA developed the Infrastructure Voluntary Evaluation Sustainability Tool (INVEST), a web-based self-evaluation tool that transportation agencies can use to gauge their level of sustainability and systematically integrate sustainable practices into their actions.

INVEST includes three modules that allow the tool users to assess a full life cycle of a transportation project and test the extent to which the principles of sustainability are integrated into their processes. The three modules are System Planning, Project Development, and Operation and Maintenance. Each of the modules considers a different set of criteria. Each criterion includes scoring associated with an ideal outcome against which the users can rate themselves based on the detailed scoring requirements.

**SCAG’s 2012 RTP/SCS and FHWA’s INVEST: A Natural Partnership**

As SCAG looked ahead to the development of the 2016 RTP/SCS, the region stood at a crossroads. Was the 2012 RTP/SCS “sustainable enough”? How much more ambitious could it be? SCAG recognized that it was critical for its major policy decisions from that point forward to be backed by solid technical analysis that focused on sustainability and allowed SCAG to find ways to improve its RTP/SCS in the face of dwindling resources. To this end, INVEST provided a tool by which the 2012 RTP/SCS could be scored and evaluated for the purposes of identifying both strengths and weaknesses from a sustainability point of view. Given SCAG’s focus on system planning through the development of the RTP/SCS, SCAG chose to use the system planning module for its assessment. The 17 criteria of this module aided SCAG in taking a holistic approach to answering the questions of “What are we doing right?”, “Where is there room for improvement?”, and “Where do we go from here?” The answers to these questions served as a basis for the development of a set of recommendations for SCAG’s planners, stakeholders, and decision-makers alike to consider toward the development of the 2016 RTP.

**Assessment of the 2012 RTP/SCS**

INVEST’s System Planning module was used to score the completed 2012 RTP/SCS in order to establish an understanding of the level to which SCAG has already gone above and beyond current requirements in incorporating sustainability into its long-range transportation planning efforts. Of a total of 250 points, the 2012 RTP/SCS scored a total of 176 points, putting it in the top “Platinum” category (144 points or higher). A snapshot of the percent of total scores earned for each criterion can be seen in Figure E-1, listed in order of highest-performing to lowest.
The results reveal several strengths in SCAG’s current long-range transportation planning process—out of a total of 17 INVEST criteria, SCAG earned perfect scores in seven (7) criteria. SCAG’s success can be attributed to a number of key factors:

- **California’s Sustainable Communities and Climate Protection Act - Senate Bill 375 (SB 375):** SB 375 played a large role in pushing SCAG to broaden the regional stakeholders and work more closely with them with a renewed focus on sustainable transportation investments. The success of the region in meeting SB 375 requirements hinged upon SCAG’s ability to bring all relevant agencies together to develop the RTP/SCS as a region. In the end, SB 375 pushed the Southern California region to collaboratively develop a 2012 RTP/SCS that exceeded the SB 375 requirements—and earned it the top Platinum rating in INVEST.

- **Investment-Driven Results:** SCAG’s INVEST results also demonstrate a strong correlation between funding and success, as many of the high-scoring criteria reflect areas of expertise and leadership that SCAG invested substantial resources over the course of many years to develop and maintain. Examples of areas that SCAG has invested heavily in—and earned perfect INVEST scores in—are Freight and Goods Movement (SP-08), Financial Sustainability (SP-12), and Analysis Methods (SP-13).

- **Balanced Approach to Planning:** The seven (7) criteria that SCAG earned perfect scores in fall within very different areas of the planning spectrum (for example, “Integrated Planning: Social” and “Financial Sustainability”). This serves as an indicator of SCAG’s broad spectrum of expertise and the agency’s balanced approach to regional planning.

### Areas of Improvement

On the other hand, INVEST revealed a number of areas of improvement in SCAG’s regional planning process, most of which can be attributed primarily to SCAG’s limited authority in implementing projects and programs as a regional planning agency for a vast six-county region. The following challenges partially explain why SCAG did not earn higher INVEST scores:

- **Institutional challenges:** SCAG’s lack of authority to implement projects and programs as a regional planning agency requires that SCAG work closely with the implementing agencies to translate the RTP/SCS into specific actions on the ground. Given the geographic and institutional diversity of the SCAG region, this is easier said than done. The implementation of most of the regional strategies in the RTP/SCS requires participation and consensus of multiple agencies, posing tremendous institutional challenges to bring plans to fruition.

- **Data challenges:** Data and analytics are keys to informing critical investment and policy decisions. While SCAG is at the forefront of data and analytics, data availability is always an ongoing challenge. There is always need for additional data to be able to paint a complete picture of sustainable planning practices. The data challenges refer to a lack of available data that can be used to inform decisions or monitor the progress of a certain sustainability goal.

- **Resource challenges:** Resource constraints are an all-too-familiar issue across all governmental entities. Here, resource challenges refer specifically to a lack of resources on SCAG’s part to pursue certain time- and resource-consuming efforts.

Table 3-1, within the report, highlights challenges associated with most of the ten (10) criteria containing areas of improvement experiencing two or more of the challenges mentioned above.

It is evident that multiple challenges would need to be overcome in order for SCAG to improve in the areas identified by INVEST. As detailed in the report, SCAG is already doing most of what it is able to accomplish given its institutional, data, and resource limitations. As it relates to areas of improvement identified by INVEST for SCAG to monitor the region’s progress in meeting various sustainability goals and metrics, this is a direction that SCAG has begun to move toward as a result of SB 375, and will continue to build upon in the coming years.

One INVEST criteria stood out among the others as a major opportunity area for the agency: Infrastructure Resiliency (SP-16). SCAG earned 0 points in this criterion—the only non-bonus criterion that it did not earn any points in.

**Recommended SCAG Action:** Consider Infrastructure Resiliency in SCAG’s Future Planning Efforts

While INVEST confirms SCAG’s core strengths in sustainable planning practices, the tool also revealed a number of areas where SCAG has room for improvement. The assessment of the 2012 RTP/SCS provided a lot of “food for thought.” Particularly, one area that stood out among the rest was the zero score that SCAG received in Infrastructure Resiliency.

The goal of Infrastructure Resiliency as stated in INVEST is:
“Anticipate, assess, and plan to respond to vulnerability and risks associated with current and future hazards (including those associated with climate change) to ensure multi-modal transportation system reliability and resiliency.”

Vulnerability and risks could come in different forms, not just from sudden and unexpected events such as earthquake, extreme weather, or climate change. It could also come from long-term neglect of infrastructure maintenance due to chronic underfunding. Regardless of the source of vulnerability, it is clear that planning for Infrastructure Resiliency is fundamental to ensuring the maintenance of a sustainable transportation system. As pointed out by INVEST, there are several tasks that must be undertaken as a part of Infrastructure Resiliency planning. These tasks are outlined in greater detail within the report.

While the eventual goal of SCAG should be to undertake all of these tasks and integrate an Infrastructure Resiliency plan into the long-range transportation plan, it will likely take a substantial amount of resources, time, and planning to get there. Therefore, in the near term, as a starting point, the team recommends that SCAG develop a white paper to assess the feasibility of developing a Regional Infrastructure Resiliency plan that will provide a blueprint for SCAG’s future engagement in this area.

Related to Infrastructure Resiliency, SCAG recently received a grant from the California Department of Transportation (Caltrans) to study climate change adaptation and resiliency with a focus on local transit systems, and could potentially utilize this grant as a first step to beginning work on the region’s infrastructure resiliency. As this work commences, SCAG should consider how this work will fit into the larger framework of the Regional Infrastructure Resiliency Plan.

**Assessment of INVEST As a System Planning Tool**

INVEST is a valuable tool that seems to reasonably identify a region’s strengths and weaknesses as it pertains to the system planning process. The tool is very comprehensive and provides an opportunity for any agency engaged in planning or delivering transportation projects to take an honest look at its practices and conduct an evaluation of how well it is doing in achieving its goals using sustainable strategies.

From the standpoint of a regional planning agency primarily responsible for developing long range plans with very little to no implementation authority, the team found that there was a lack of clarity about whether INVEST is intended to measure the sustainability efforts of a region—as a region—or the metropolitan planning organization as an agency. Clarifying this nuance could help INVEST provide a more accurate picture of how well a region (or agency) is planning for sustainability.

As far as the user friendliness of the tool, the team reviewed both Versions 1.0 and 1.1 of INVEST, and found that Version 1.1 makes improvements that move INVEST in the right direction as it relates to user friendliness. However, the team identified some additional areas of improvement in the hopes of helping FHWA make INVEST an even easier tool for future users. These areas of improvement are discussed in further detail within the report.

**Conclusion**

The SCAG team found the use of INVEST to be an enlightening experience that allowed SCAG to gauge its recent regional transportation planning efforts against the national sustainability mindset. The team was thrilled to earn a Platinum rating, and found it beneficial to discover new areas of improvement that can help the region to achieve a more sustainable future. Specifically, INVEST helped SCAG recognize the need to consider infrastructure resiliency in the agency’s future planning agenda. Plenty of institutional, resource, and data challenges lie ahead as SCAG looks ahead to the development of the 2016 RTP/SCS, but with the direction provided by INVEST, the SCAG region will be able to not only continue, but to build on its past efforts in planning for a more sustainable Southern California.
INTRODUCTION

The Southern California Association of Governments (SCAG) is the designated metropolitan planning organization (MPO) for the six Southern California counties of Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura. SCAG’s membership includes 191 local jurisdictions within the six counties, as well as county transportation commissions for each of the counties. Furthermore, the SCAG region is divided into 15 subregions that are represented by SCAG, which also functions as a Council of Governments (COG). In accordance with federal requirements, SCAG is responsible for updating a long-range vision of the regional transportation system for its six counties at least once every four years. As the nation’s largest MPO, SCAG faces many challenges in developing regional long-range strategies that are environmentally sustainable, socially equitable, economically sound, and also meet the mobility and accessibility needs of its residents.

The region is home to over 18 million residents, and this figure is expected to increase by an additional 4 million by 2035. The majority of this growth is expected to occur in the suburban inland counties of Riverside and San Bernardino, creating the need for commuters to travel longer distances, on average, to access jobs in other counties. If left unaddressed, this growing imbalance of jobs and housing will increase the region’s average per capita vehicle miles traveled (VMT), worsening both congestion and air quality. In addition, there are a number of other daunting challenges that the region must address in order to maintain the economic competitiveness and the quality of life issues for its residents. Some of the key challenges are briefly highlighted in the following sections.

Mobility Challenges

The challenges facing the region are daunting. The region’s roadways are the most congested in the nation, and traffic relief is critical, even more so in our current economic climate. Approximately 3 million hours are wasted by the region collectively stuck in traffic on any given weekday, and this figure is likely to increase to 6 million hours by 2035 if the region maintains a “business-as-usual” stance to transportation planning. Addressing congestion is absolutely critical to maintaining the region’s quality of life and economic competitiveness.

Safety Challenges

While SCAG’s roadways are among the nation’s safest, the fatality rates of those traveling via sustainable modes of transportation are alarming—21% of all traffic-related fatalities involve pedestrians. If left unaddressed, this could pose as a
deterrent to travelers considering active transportation as a viable alternative to driving for shorter trips.

**Air Quality Challenges**
While Southern California is a leader in reducing emissions, in which ambient levels of air pollutants are improving, the region continues to have the worst air quality in the nation. In addition, air pollution still causes thousands of premature deaths every year, as well as other serious adverse health effects.

**System Preservation Challenges**
Perhaps the most critical challenge is the need for developing and maintaining our transportation infrastructure in a sustainable way, including addressing our long-term transportation funding needs. With the projected growth in population, employment, and demand for travel, the costs of our multimodal transportation system needs surpass projected revenues available from our historic transportation funding source—the gas tax. Improved fuel efficiency and the growth of alternative-fuel vehicles have reduced fuel consumption and eroded gas tax revenues. Additionally, state and federal gas taxes have not kept up with inflation—the last adjustments occurred nearly two decades ago.

The region’s aging transportation system is facing increasing preservation costs in the face of diminishing revenues. These regional assets represent trillions of dollars of investments that must be protected in order to serve current and future generations. The loss of even a small fraction of these assets could significantly compromise the region’s mobility. Unfortunately, the region and the state have underinvested in system preservation and deferred critical maintenance of our multimodal transportation system. The inevitable consequences of deferred maintenance include deficient road pavement conditions, particularly evident on our highways. The rate of deterioration is expected to accelerate significantly with continued deferral. In turn, the cost of bringing these assets back into a state of good repair is projected to grow exponentially.

**Goods Movement Challenges**
The SCAG region is the largest international trade gateway in the U.S., supported by marine ports, air cargo facilities, railroads, regional highways, and state routes. With port traffic expected to triple over the next 25 years, the region’s economic competitiveness depends upon a transportation system that facilitates the safe and reliable movement of goods. Goods movement is a major source of emissions that contribute to the region’s air pollution. An essential element to improving the region’s goods movement system is to reduce its current and long-term impacts on public health and the environment.

**Financial Challenges**
As discussed later on in this report, there is no shortage of ideas on what investments the region should make in order to address the challenges discussed above and move toward greater sustainability. However, the final—and perhaps greatest—challenge faced by the region is its ability to fund all of those investments. The costs to meet the sustainable transportation needs of the region are quite substantial—$525 billion through 2035, to be exact—and projected revenues available from historic transportation funding sources will come nowhere near that figure. The region finds on its hands a major challenge to identify funds to even maintain its existing transportation infrastructure, let alone improve them or build new ones.

**SCAG’S PAST SUSTAINABILITY EFFORTS AND THE SB 375 OPPORTUNITY**
For decades prior to 2012, SCAG had addressed these challenges by preparing Regional Transportation Plans (RTPs) with a primary focus on improving mobility and air quality for the region’s residents and visitors. While mobility and air quality are vital components of quality of life, they are by no means the only ones. Partly encouraged by California’s Sustainable Communities and Climate Protection Act - State Senate Bill 375 (SB 375), SCAG began to take a comprehensive approach to regional planning by broadening the regional goal to incorporate sustainability and improve the quality of life in general. SB 375, at its core, is a greenhouse gas (GHG) reduction bill passed by the California State Legislature on September 30, 2008. Specifically, SB 375 requires the MPOs in California such as SCAG to reduce GHG emissions from cars and light trucks by reducing VMT through implementation of a Sustainable Communities Strategy that link transportation investment decisions to local land use strategies.

**SCAG’S APPROACH TO DEVELOPING THE 2012 RTP/SCS**
To address the challenges and SB 375 requirements indicated above, SCAG performed a careful analysis of the region’s transportation system, the future growth of the region, and potential new sources of revenue, and embarked on a massive outreach undertaking to hear what the region had to say. While SCAG continued to work closely through hundreds of meetings with stakeholder agencies and elected officials with which it has always collaborated, it also conducted an unprecedented number of planning workshops and additional meetings throughout the region to engage a broad range of stakeholders, including non-traditional stakeholders from the active transportation and public health communities. Throughout every step of the development process, SCAG shared technical findings and draft policy recommendations, and solicited continued feedback from the various groups.
SCAG’s 2012 RTP/SCS

The result of this multi-year effort is the 2012 RTP/SCS, a shared vision for the region’s sustainable future. Adopted by SCAG’s Regional Council on April 4, 2012, the 2012 RTP/SCS is the region’s first long-range transportation plan developed pursuant to the requirements of SB 375. SB 375 requires the California Air Resources Board to determine per capita GHG emission reduction targets for each MPO in the state at two points in the future—2020 and 2035. In accordance with Govt. Code Section 65080(b)(2)(B)(vii), the 2012 RTP/SCS will achieve GHG emission reductions of 9 percent per capita in 2020 and 16 percent per capita in 2035 (surpassing both reduction targets of 8 and 13 percent for the years 2020 and 2035, respectively). Figure 1-2 depicts the three foundational tenets of the 2012 RTP/SCS—namely, mobility, sustainability, and the economy.
The Framework

The 2012 RTP/SCS proposes that the region follow a system management approach that aims to protect and maximize the productivity of existing transportation infrastructure before strategically expanding it. This approach recognizes that the region can no longer afford to rely on system expansion alone to address its mobility and sustainability needs. Rather, an integrated approach is needed, based upon comprehensive system monitoring and evaluation and the use of performance measures to ensure that the best-performing projects and strategies are included in the RTP/SCS. This approach, depicted in the mobility pyramid (Figure 1-3), is key to ensuring that the region enjoys a sustainable transportation system over the long haul.

**FIGURE 1-3. MOBILITY PYRAMID**

- **System Completion and Expansion**
- **Operational Improvements**
- **Intelligent Transportation Systems**
- **Traveler Information / Traffic Control**
- **Incident Management**
- **Smart Land Use**
- **Demand Management / Value Pricing**
- **Maintenance and Preservation**
- **System Monitoring and Evaluation**

**Maintenance and Preservation**

As one of the foundational layers of the pyramid, maintenance and preservation is given a high priority in the 2012 RTP/SCS, which seeks to ensure the sustainability of the region’s transportation infrastructure. Recognizing that deferring the maintenance of the transportation system will only result in costlier repairs in the future, preserving assets now is a critical priority of the 2012 RTP/SCS. Approximately $217 billion, or almost half of all of its proposed expenditures through 2035, is allocated to system preservation and operation. To a great extent, this high cost is a result of three decades of underinvestment in maintaining the region’s transportation infrastructure. Deficient road conditions are all too familiar to the region’s drivers, and without a renewed commitment to improving the condition of our transportation infrastructure, costs will increase even more dramatically. Therefore, SCAG commits itself to continue working with its stakeholders, particularly county transportation commissions and Caltrans, to identify new funding sources and/or increased funding levels for preservation and maintenance. Figure 1-4 presents the allocation of maintenance and operations expenditures for the region’s transit system, state highway system, and arterials of regional significance.

**FIGURE 1-4. 2012 RTP/SCS MAINTENANCE AND OPERATIONS EXPENDITURES**

- **Transit** 64%
- **State Highways** 26%
- **Regionally Significant Arterials** 10%

**Smart Land Use/Demand Management/Value Pricing**

The 2012 RTP/SCS also recognizes that smart land use, demand management, and value pricing are critical elements of a sustainable transportation plan.

**Smart Land Use**

Since initiating one of the nation’s first large-scale regional growth visioning efforts in 2000, SCAG has sought to integrate land use and transportation by working with its sub-regions and local communities to increase development densities and improve the jobs/housing balance. Implementing such smart land use strategies encourages walking, biking, and transit use, and therefore reduces vehicular demand. This saves travel time, reduces pollution, and leads to improved health. The 2012 RTP/SCS builds on past successes and encourages the further implementation of smart land use strategies.

**Demand Management**

The 2012 RTP/SCS also includes a significant investment in transportation demand management (TDM) strategies to reduce vehicular demand and thereby congestion, particularly during peak periods. In total, the RTP/SCS allocates $4.5 billion to TDM strategies to target such drivers and others and incentivize them in three ways:

- Increase carpooling and vanpooling
- Increase the use of transit, bicycling, and walking
- Redistribute vehicle trips from peak demand periods to non-peak periods by shifting work times/days/locations

**Value Pricing**

Furthermore, the 2012 RTP/SCS proposes a regional Express/HOT Lane system that utilizes pricing to better utilize existing capacity and to offer users greater travel time reliability and new choices. Express/HOT Lanes that are appropriately priced to reflect the true cost of travel demand can outperform non-priced lanes in terms of throughput, especially during congested periods. Moreover, revenue generated from priced lanes can be used to deliver the needed capacity provided by the Express/HOT Lanes sooner and to support complementary transit investments. SCAG developed
Assessing Sustainable Planning in Southern California  |  Background

This regional network as inter-county trips comprise more than 50 percent of all trips, suggesting the value and timeliness of a regional network of Express Lanes that would seamlessly connect multiple counties.

**FIGURE 1-5. REGIONAL EXPRESS/HOT LANE NETWORK**

Transportation Systems Management

Moving up the mobility pyramid, the 2012 RTP/SCS further utilizes transportation systems management (TSM) to increase the productivity of the existing multimodal transportation system, thereby reducing the need for system expansion. The 2012 RTP/SCS recognizes the limitations of roadway expansions as a primary means of addressing congestion, not only due to dwindling funding sources, but also due to environmental and political challenges associated with such options. TSM relies in part on intelligent transportation system (ITS) technologies to increase traffic flow and reduce congestion. This RTP/SCS dedicates up to $7.6 billion to TSM. Examples of TSM in the RTP/SCS include:

- Enhanced Incident Management
- Advanced Ramp Metering
- Traffic Signal Synchronization
- Advanced Traveler Information

TSM will also play an increasingly larger role in regional goods movement improvements. The Ports of Los Angeles and Long Beach have identified ITS technologies, specifically automated vehicle location (AVL), as a major component in their proposed air quality mitigation strategies. Advanced monitoring will assist in achieving system efficiencies in ports and intermodal operations, reducing delays and wait times at gates and destinations, and allowing for more flexible dispatching, all of which reduce emissions. Weigh-in motion systems and enhanced detection will allow for better enforcement of commercial vehicles rules, reducing pavement damage, and identifying critical paths for goods movement planning in the future.

System Completion and Expansion

While the RTP/SCS’s multimodal strategy aims to reduce per capita VMT over the next 25 years, total demand to move people and goods will continue to grow due to the region’s population increase. A strategic expansion of the transportation system is still needed in order to provide the region with the
mobility choices it needs. The RTP/SCS targets this expansion primarily to close the existing gaps in the system and around transportation systems that have room to grow, including transit, high-speed rail, active transportation, Express/HOT lanes, and goods movement. Improved access to transit, expanded active transportation network, and integrated Express/HOT lanes, have proven over the years to be reliable and convenient mode choices. In order to continue enhancing these modes as viable alternative and/or additional mode choices, the region must continue to improve and expand them strategically. Other systems, such as high-speed rail, are new to the region and are needed to expand the number of choices available to residents for convenient longer-haul travel. In addition, to address both the need to move more goods efficiently throughout the region for the growing population and maintain regional economic benefits of the goods movement industry, the region must continue to strategically expand and improve the region’s freight delivery system so as to support the quality of life that this region is accustomed to.

Transit
As part of its sustainability focus, the 2012 RTP/SCS calls for an impressive expansion of transit facilities and services over the next 25 years—$55 billion in capital projects. The local county sales tax programs, most recently Measure R in Los Angeles County, are providing for most of this expansion in facilities and services. Once built out, Los Angeles County will have a greatly expanded rail network, adding entire new corridors and expanding existing ones. Orange County will greatly improve its Metrolink service and implement a host of new bus rapid transit (BRT) routes, Riverside County will introduce various extensions to its Metrolink line, and San Bernardino County will introduce Redlands Passenger Rail.

FIGURE 1-6. 2012 RTP/SCS RAIL TRANSIT SYSTEM

> Passenger and High-Speed Rail
The 2012 RTP/SCS also proposes over $50 billion for three Passenger Rail strategies that will provide additional sustainable travel options for long-distance travel within our region and to neighboring regions. These are improvements to the Los Angeles-San Diego-San Luis Obispo (LOSSAN) Rail Corridor, improvements to the...
existing Metrolink system, and the implementation of Phase I of the California High-Speed Train (HST) project.

**Active Transportation**

To promote greater widespread use of sustainable modes of transportation, the 2012 RTP/SCS also allocates over $6 billion for active transportation improvements—almost triple the amount in the previous RTP. The 2012 RTP/SCS aims to develop a regional active transportation system that closes the gaps in the existing network and provides connectivity between counties and local jurisdictions. Even though bicyclists are legally allowed to use any public roadway in California unless specifically prohibited, many bicyclists may be more inclined to utilize bikeways.

Currently, 42.6 percent of the region’s residents have easy access to 4,315 miles of bikeways. Local jurisdictions in the region have proposed an additional 4,980 miles of bikeways in this RTP/SCS that would increase this access to 62.4 percent of all residents. In order to close the remaining gaps in the bikeway network, this RTP/SCS goes a step further to include an additional 827 miles of bikeways to complete the SCAG Regional Bikeway Network. The 2012–2035 RTP/SCS also calls for improvements that would bring significant amount of deficient sidewalks into compliance with the Americans with Disabilities Act (ADA). Given that all trips begin with walking—even vehicular trips—it is important to ensure that sidewalks and streets are accommodating to all users.

**FIGURE 1-7. 2012 RTP/SCS REGIONAL BICYCLE NETWORK**
MAINLINE RAIL IMPROVEMENTS & EXPANSION
By considering routing alternatives, the 2012–2035 RTP/SCS identified a number of potential regional rail improvements and capacity expansion strategies critical to accommodate projected levels of future train traffic on the BNSF and UP lines. These strategies are intended to reduce capital costs, increase safety, reduce train volumes through the worst bottlenecks, avoid the most costly line expansions, separate passenger rail from heavy UP traffic expansion, and route freight lines where they are the most environmentally friendly.

RAIL SAFETY & GRADE SEPARATIONS
Seventy-one grade separations throughout the SCAG region, estimated at $5.6 billion, were included in the financially constrained 2012–2035 RTP/SCS to reduce traffic congestion and delays, reduce emissions from idling vehicles, and address other critical rail crossing related concerns such as noise and safety.

BOTTLENECK RELIEF STRATEGY
Heavy truck congestion, often stemming from highway bottlenecks, results in delays, wasted labor hours, and increased fuel usage costing the SCAG region approximately $2.6 billion in 2010 alone. In the 2012–2035 RTP/SCS, SCAG identified $5 billion in total investments over the next 25 years to address the top 50 regional priority truck bottlenecks that would reduce delay and associated emissions.

ENVIRONMENTAL STRATEGY
For the near term, the regional strategy supports the deployment of commercially available lower-emission trucks and locomotives while centering on continued investments in improved system efficiencies. For the long term, the 2012–2035 RTP/SCS strategy focuses on taking critical steps now toward phased implementation of a zero- and near-zero emission freight system. This includes planning for new infrastructure to incorporate evolving technologies—to fuel vehicles as well as to charge batteries and provide power.

For 2013–2015, the regional strategy includes demonstration and initial deployment of zero- and/or near-zero emission trucks receiving wayside power.

EXISTING GOODS MOVEMENT SYSTEM

<table>
<thead>
<tr>
<th>Industry</th>
<th>Contributions (billion GRP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturing</td>
<td>$91</td>
</tr>
<tr>
<td>Wholesale Trade</td>
<td>$50</td>
</tr>
<tr>
<td>Retail Trade</td>
<td>$46</td>
</tr>
<tr>
<td>Transport and Warehouse</td>
<td>$22</td>
</tr>
<tr>
<td>Utilities</td>
<td>$10</td>
</tr>
<tr>
<td>Mining</td>
<td>$3</td>
</tr>
<tr>
<td>Forestry, Fishing, and Related Activities</td>
<td>$0.38</td>
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</table>

2010 CONTRIBUTIONS OF REGIONAL GOODS MOVEMENT DEPENDENT INDUSTRIES

<table>
<thead>
<tr>
<th>Mobility</th>
<th>Benefits</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Truck delay reduction of approximately 11 percent</td>
</tr>
<tr>
<td></td>
<td>All traffic delay reduction of approximately 4.3 percent</td>
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<tr>
<td></td>
<td>Reduces truck volumes on general purpose lanes – 42 percent to 82 percent reduction on SR-60</td>
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<table>
<thead>
<tr>
<th>Safety</th>
<th>Benefits</th>
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<tr>
<td></td>
<td>Reduced truck / automobile accidents (up to 20-30 per year on some segments)</td>
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<table>
<thead>
<tr>
<th>Environment</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>100 percent clean truck utilization removes: 4.7 tons NOx, 0.16 tons PM2.5, and 2,401 tons CO2 daily. (2.7 percent to 6 percent of region’s total)</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Community</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Preferred alignment has least impact on communities</td>
</tr>
<tr>
<td></td>
<td>Reduces traffic on other freeways</td>
</tr>
<tr>
<td></td>
<td>Zero- and/or near-zero emission technology reduces localized health impacts</td>
</tr>
</tbody>
</table>
ON-, NEAR-, AND OFF DOCK RAIL IMPROVEMENTS

Additional capacity is needed at regional on-, near-, and off dock railyards to accommodate anticipated growth in regional cargo. The 2012–2035 RTP/SCS includes almost $2.7 billion in rail improvements within the harbor area. It also supports projects such as modernization of the Intermodal Container Transfer Facility (ICTF) and the Southern California International Gateway (SCIG) to add intermodal capacity, reduce vehiclemiles-traveled, and reduce emissions.

REGIONAL CLEAN FREIGHT CORRIDOR SYSTEM

A system of zero- and/or near-zero emission truck-only lanes, extending from the San Pedro Bay Ports to downtown Los Angeles and then eastward to the Inland Empire, is expected to address growing truck traffic on core regional highways mitigating impacts on communities and the environment. Physically separated from mixed-flow traffic, these truck-only lanes effectively add capacity in congested corridors, improve operations, and increase safety by separating trucks and autos. The 2012–2035 RTP/SCS includes an SR-60 adjacent east-west freight corridor concept to link to the initial north-south segment (I-710) originating near the San Pedro Bay Ports.

2010 CONTRIBUTIONS OF REGIONAL GOODS MOVEMENT DEPENDENT INDUSTRIES

- Imperial County
- Manufacturing: 799,000 jobs
- Retail Trade: 895,000 jobs
- Wholesale Trade: 436,000 jobs
- Construction: 393,000 jobs
- Transport and Warehouse: 311,000 jobs
- Utilities: 25,000 jobs
- Mining: 18,000 jobs
- Forestry, Fishing, and Related Activities: 24,000 jobs
- Employment Contributions – 2.9 Million Jobs

MOVEEMENT DEPENDENT INDUSTRIES

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<tr>
<td>Forestry, Fishing, and Related Activities</td>
<td>24,000</td>
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BENEFITS OF THE RAIL STRATEGY

- Mobility
  - Reduces train delay to 2000 levels
  - Provides main line capacity to handle projected demand in 2035 (includes 39.4 million twenty-foot equivalent units, or TEUs)
  - Eliminates 5,782 vehicle hours of delay per day at grade crossings in 2035

- Safety
  - Eliminates 71 at-grade railroad crossings

- Environment
  - Reduces 22,789 lb of emissions per day (CO₂, NOₓ, and PM₂.5 combined) from idling vehicles at grade crossings
  - Facilitates on-dock rail
  - Reduces truck trips to downtown railyards and associated emissions
Goods Movement System

A reliable goods movement system to move goods to market is also critical for the region’s long-term sustainability, as well as its global competitiveness, economy, and quality of life. Therefore, the 2012 RTP/SCS proposes nearly $50 billion worth of goods movement improvements in order to ensure continued prosperity while mitigating environmental impacts of the goods movement system. Key goods movement investments proposed in the 2012 RTP/SCS include the following.

- Rail safety and grade separations
- Mainline rail improvements and expansion
- Bottleneck relief strategy
- Environmental strategy (i.e. zero- and near-zero emission freight system)
- East-West Freight Corridor
- On-, Near-, and Off dock rail improvements

<table>
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Summary of the 2012 RTP/SCS

In summary, the 2012 RTP/SCS provides a robust blueprint for improving quality of life for the region’s residents by providing more sustainable transportation choices for where they will live, work, and play—and how they will move around. Its safe, secure, and efficient transportation systems will provide improved access to opportunities, such as jobs, education, and healthcare. Its emphasis on transit and active transportation will allow residents to lead a healthier, more active lifestyle. It will create jobs, ensure our region’s economic competitiveness through strategic investments in the region’s goods movement system, and improve environmental and health outcomes for its 22 million residents by 2035. More importantly, the RTP/SCS will also preserve what makes the region special, including its stable and successful neighborhoods and array of open spaces for future generations to enjoy.

FHWA’s Focus on Sustainability: INVEST

While SCAG was developing the 2012 RTP/SCS, FHWA was hard at work supporting research, development, and implementation efforts at the forefront of the sustainability movement. Improving the sustainability of the transportation system is a national priority for FHWA, and the application of
the INVEST tool is intended to support this national goal. The Sustainable Highways Initiative was developed to support various activities conducted across FHWA to facilitate balanced decision-making among environmental, economic, and social values—the triple bottom line of sustainability. As part of its focus on sustainability, in 2012, FHWA developed the Infrastructure Voluntary Evaluation Sustainability Tool (INVEST), a web-based self-evaluation tool that transportation agencies can use to gauge their level of sustainability and systematically integrate sustainable practices into their actions.

FHWA partnered with 19 organizations across the country to develop and pilot test INVEST. Since INVEST was developed using input and advice from transportation professionals with their specific needs in mind, the information in INVEST is intended to be practical and tangible, and aims to relate to the tasks transportation organizations perform on a day-to-day basis. The tool translates broad sustainability principles into specific actions, and gives transportation professionals a way to think about sustainability in a measurable way. INVEST is intended to help transportation agencies go above and beyond minimum requirements to promote responsible stewardship of our valuable transportation assets.

FHWA provides INVEST free of charge to any agency that would like to perform a sustainability self-evaluation, and allows agencies to choose how to use the results. Agencies can keep results to themselves, or publicize results to demonstrate to the public and stakeholders a commitment to sustainability and self-improvement. Regardless, it is FHWA’s hope that INVEST will help to move the nation’s transportation agencies toward a greater focus on sustainability by providing an easy-to-use self-evaluation tool for agencies that are involved in any stage of the transportation planning and implementation process—from system planning to project development to operations and maintenance.

How INVEST Works

INVEST includes three modules described below that allow the users to assess a full life cycle of a transportation project and test the extent to which the principles of sustainability are integrated into their processes. The three modules are System Planning, Project Development, and Operation and Maintenance. Each of the modules considers a different set of criteria, and each criterion includes scoring associated with an ideal outcome against which the users can rate themselves based on detailed scoring requirements. The following are brief descriptions of each of the modules.

1. System Planning (SP): Project implementation begins with system planning. Inclusion of a project in the RTP/SCS can be viewed as a first step towards the beginning of the life cycle of a project. System planning is where initial need for a project, potential impact as well as benefits and outcomes of a project are considered from a system performance perspective. This module allows an MPO to assess its system plan, primarily a long range plan known as the RTP/SCS at SCAG, for its strength and weaknesses from a sustainability standpoint.

2. Project Development (PD): This module allows an implementing agency to assess and improve the sustainability of specific transportation projects under development, or learn from projects already completed. It also allows an agency to conduct a programmatic evaluation of agency construction practices and opportunities for sustainability improvements.

3. Operations and Maintenance (OM): This module allows an owner or operator of a transportation facility to review and assess operations and maintenance programs at the district or statewide level at the system level.

There is one scorecard each for the SP and OM modules, and there are six options for scorecards for the PD module (depending on the project type and location). Each scorecard contains a number of criteria webpages, each of which contains the following:

- Guidance on integrating sustainability from the perspective of that criterion
- Links to criterion-specific references (i.e. best practices, publications, etc.)

A set of questions for agencies to answer regarding the extent to which they integrate sustainability as it pertains to that criterion

The questions are designed to reward agencies that go above and beyond current federal requirements; no points are awarded for meeting existing requirements. As the questions are answered, the scorecard tallies the total points earned and rates the agency’s efforts toward sustainability, from platinum (highest rating, with at least 60% of the total possible points earned) to bronze (lowest rating, with 30% of the total possible points earned). Figure 1-10 shows a screenshot of the homepage for the System Planning Scorecard, which was used in this effort.

FIGURE 1-10. SCREENSHOT OF INVEST SYSTEM PLANNING SCORECARD HOME PAGE
As SCAG looked ahead to the development of the 2016 RTP/SCS, the region stood at a crossroads. Was the 2012 RTP/SCS “sustainable enough”? How much more ambitious could it be? SCAG recognized that it was critical for its major policy decisions from that point forward to be backed by solid technical analysis that focused on sustainability and allowed SCAG to find ways to improve its RTP/SCS in the face of dwindling resources. To this end, INVEST provided an instrument by which the 2012 RTP/SCS could be scored and evaluated for the purposes of identifying both strengths and weaknesses from a sustainability point of view. Given SCAG’s focus on system planning through the development of the RTP/SCS, SCAG used only the System Planning module for its assessment. The 17 criteria of this module aided SCAG in taking a holistic approach to answering the questions of “What are we doing right?”, “Where is there room for improvement?”, and “Where do we go from here?” The answers to these questions served as a basis for the development of a set of recommendations for SCAG’s planners, stakeholders, and decision-makers to consider in the development of the 2016 RTP.

This report documents the assessment of the 2012 RTP/SCS using INVEST, recommendations for the 2016 RTP/SCS that were developed as a result of the INVEST assessment, as well as feedback regarding INVEST itself.
ASSESSMENT OF THE 2012 RTP/SCS

INVEST’s System Planning module was used to score the completed 2012 RTP/SCS in order to establish an understanding of the level to which SCAG has already gone above and beyond current requirements in incorporating sustainability into its long-range transportation planning efforts. Of a total of 250 points, the 2012 RTP/SCS scored a total of 176 points, putting it in the top “Platinum” category (144 points or higher). A snapshot of the percent of total scores earned for each criterion can be seen in Figure 2-1, listed in order of highest-performing to lowest.

FIGURE 2-1. SUMMARY OF 2012 RTP/SCS INVEST PERCENT SCORES BY CRITERIA
**100% | INTEGRATED PLANNING: SOCIAL (SP-03)**

**SCORE: 15/15**

**INVEST Goal:** This criterion tests an agency's RTP for consistency with the community’s sustainability vision and goals, and assesses whether the agency uses context-sensitive principles in the planning process to achieve solutions that balance multiple objectives to meet stakeholder needs.

**Strengths:** SCAG scored full marks in the “Integrated Planning: Social” criterion thanks to an unprecedented level of collaboration with stakeholders that drove the development of the 2012 RTP/SCS—the first RTP to include a Sustainable Communities Strategy (SCS) as required by SB 375.

Since its inception, SCAG has encouraged a wide variety of public participation in developing its regional transportation plans and programs. In 1993, SCAG’s Regional Council originally adopted “Policies, Procedures and Guidelines for Public Participation and Interagency Consultation.” As a result of changes in the metropolitan planning law in 2005, SCAG broadened its participation activities to engage a more extensive group of stakeholders in its planning and programming processes, as reflected in SCAG’s Public Participation Plan adopted by the Regional Council in October 2007. Finally, in December 2009, the Regional Council approved an amendment to the Public Participation Plan, which addressed new public participation requirements under state law (SB 375) and committed SCAG to a new and comprehensive level of outreach never undertaken before.

The latest Public Participation Plan called for SCAG to conduct a three phases of outreach for the development of the 2012 RTP/SCS: Pre-Draft (January 2009 through December 2011), Post-Draft (December 2011 through March 2012), and Post RTP/SCS adoption (after April 2012). Throughout all three phases, SCAG worked hand-in-hand with local agencies to integrate regional and local planning efforts, offering partners the opportunity to provide and review data and recommendations each step of the way. SCAG conducted 175 one-on-one meetings with local jurisdictions and held more workshops and meetings than ever before to develop the 2012 RTP/SCS in the most collaborative way possible, in order to ensure consistency between regional and local plans and goals.

**Recommended SCAG Action:** Continue current efforts.

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**100% | FREIGHT AND GOODS MOVEMENT (SP-08)**

**SCORE: 15/15**

**INVEST Goal:** This criterion assesses whether an agency has implemented a transportation system plan that meets freight access and mobility needs while also supporting triple bottom line sustainability principles.

**Strengths:** SCAG earned full scores in the “Freight and Goods Movement” criterion as a result of years of developing regional goods movement plans in close collaboration with national, statewide, and regional stakeholders.

Goods movement plays a large role in Southern California’s transportation landscape as a result of the sheer size of the industry and its impact to both the region and the nation. Almost half of the nation’s shipping containers is handled by the region’s freight infrastructure. The industry sustains 2.9 million jobs in the region alone, and goods movement-dependent industries are responsible for 35 percent of all regional jobs. At the same time, there are daunting challenges, as congested highways and rail corridors serve as a barrier to keeping the economy growing and as a risk to public health.

- Regional truck vehicle miles traveled will increase by over 80% by 2035, growing from 6.8% of total VMT in 2008 to 10% by 2035.
- Competition between truck and passenger traffic will grow, dropping average speeds for all vehicles, resulting in an average of 5.4 million hours of daily traffic delay.
- Rail volume will increase from 77 trains per day in 2010 to nearly 189 trains per day in 2035, a 245 percent increase, along certain segments of the mainline rail network.
- Grade crossing delays are expected to increase by an average of 269 percent for all rail lines combined with some seeing increases of over 400 percent.

To address these challenges, SCAG has continued to actively participate in the Southern California National Freight Gateway Collaboration, through which regional, state, and federal transportation and resource agencies work together to explore ways to support the movement of goods, the economic health of the region and nation, and the health of Southern California’s communities. The Collaboration represents an unprecedented level of coordination and collaboration in the nation’s leading trade gateway.

As a result of this work, SCAG was able to include in the 2012 RTP/SCS an ambitious plan to achieve the Collaboration’s vision of developing a world-class coordinated Southern California goods movement system that accommodates growth in the throughput of freight to the region and nation in ways that support the region’s economic vitality, attainment of clean air standards, and quality of life for the region’s communities. Key goods movement investments included in the 2012 RTP/SCS include:

- Rail safety and grade separations
- Mainline rail improvements and expansion
- Bottleneck relief strategy
- Environmental strategy (i.e. zero- and near-zero emission freight system)
- East-West Freight Corridor
- On-, Near-, and Off dock rail improvements.

**Recommended SCAG Action:** Continue current efforts.
100% | AIR QUALITY (SP-10)
SCORE: 15/15

INVEST Goal: This criterion evaluates whether an agency plans, implements, and monitors multimodal strategies to reduce emissions and establish a process to document emissions reductions.

Strengths: SCAG satisfied all requirements of the “Air Quality” criterion in part by utilizing a system management approach to develop the 2012 RTP/SCS. While the system management approach has several goals outside of air quality, the approach favors a number of air quality-enhancing strategies such as smart land use, demand management, and operational improvements over system expansion. In addition, SCAG also monitors and manages implementation of Transportation Control Measures (TCM), transportation projects that will reduce emission by either reducing vehicle trips or improving traffic flow. This program further supports SCAG’s efforts to improve air quality and maintain a sustainable environment.

The 2012 RTP/SCS utilizes a multimodal strategy that promotes the use of a number of sustainable modes of transportation by allocating significantly higher levels of funding to support sustainable modes and strategies such as Active Transportation, Transit, TDM, and TSM. For example, the 2012 RTP/SCS allocates $6.7 billion for Active Transportation, which is three times the allocation for this mode in the 2008 RTP.

Finally, in order to further promote air quality improvements among its partner agencies, SCAG also manages several grants used by implementing agencies for various air quality improvement efforts, including the system wide planning of electric vehicle charging stations.

Note: Since SCAG has no implementation authority, the team answered questions about implementation by considering how SCAG works with the region’s implementing agencies to execute such strategies.

Recommended SCAG Action: Continue current efforts.

100% | FINANCIAL SUSTAINABILITY (SP-12)
SCORE: 15/15

INVEST Goal: This criterion tests whether an agency evaluates and documents that financial commitments made in transportation planning documents are reasonable and affordable.

Strengths: SCAG earned all possible points in the “Financial Sustainability” criterion thanks to its nationally-recognized efforts in ensuring the financial sustainability of the programs and projects contained in the RTP. In order to accomplish this, SCAG worked closely with several partner agencies to develop both accurate cost estimates and revenue forecasts through 2035.

In order to develop the most accurate cost estimates possible for the 2012 RTP/SCS, SCAG asked each of the region’s six county transportation commissions to submit detailed capital costs for every highway and transit project proposed for the region. The RTP/SCS expenditure estimates also included capital costs for regionally significant arterials, active transportation, goods movement, intelligent transportation systems, and transportation demand management investments. The county transportation commissions submitted their detailed capital costs via an Internet-based database application developed and hosted by SCAG. Figure 2-2 shows an example of the standardized template that the county transportation commissioned used to submit cost information for capital projects.

FIGURE 2-2. 2012 RTP/SCS STANDARDIZED TEMPLATE FOR FINANCIAL INFORMATION

EXAMPLE PROJECT COSTS BY CATEGORY

<table>
<thead>
<tr>
<th>Source</th>
<th>Engineering ($1,000's)</th>
<th>Right-of-Way ($1,000's)</th>
<th>Construction ($1,000's)</th>
<th>Total Costs ($1,000's)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal Funding</td>
<td>$2,000</td>
<td>$4,000</td>
<td>$49,000</td>
<td>$55,000</td>
</tr>
<tr>
<td>State Funding</td>
<td>$7,000</td>
<td>$3,000</td>
<td>$15,000</td>
<td>$35,000</td>
</tr>
<tr>
<td>Local Funding</td>
<td>$0</td>
<td>$0</td>
<td>$3,000</td>
<td>$3,000</td>
</tr>
<tr>
<td>Private Funding</td>
<td>$0</td>
<td>$0</td>
<td>$7,000</td>
<td>$7,000</td>
</tr>
<tr>
<td>Total Funding</td>
<td>$15,000</td>
<td>$10,000</td>
<td>$67,000</td>
<td>$92,000</td>
</tr>
</tbody>
</table>

SCAG then inflated project costs to the respective years of completion in order to estimate future nominal costs. SCAG also used local detailed forecasts for transit operating and maintenance (O&M) costs where available. Where they were not available, SCAG estimated future O&M costs based on historical increases. For multimodal system preservation and maintenance costs, SCAG utilized needs assessments performed by a number of agencies (including the California Transit Association, Caltrans, FTA, the League of California Cities, and the California State Association of Counties) to estimate the expenditures needed to bring the transit, local streets and roads, and the State Highway System to a state of good repair.

In order to identify the funds needed to pay for the investments of the 2012 RTP/SCS, SCAG then prepared two types of revenue forecasts:

- Core revenues
- Reasonably available revenues

The core revenues identified are those that have been committed or historically available for the building, operation, and maintenance of the current roadway and transit systems in the SCAG region. Essentially, these revenues are existing transportation funding sources projected through FY2035. The core forecast does not include future increases in state or federal gas excise tax rates (other than the pro forma increases in the state excise tax due to the state gasoline sales tax swap) or adoptions of regional gasoline taxes, vehicle miles traveled (VMT) taxes, and new tax measures. These revenues provide a benchmark from which additional funding can be identified.

The region’s reasonably available revenues include new sources of transportation funding likely to materialize within the 2012 RTP/SCS timeframe. These sources include adjustments to existing state and federal gas tax rates based on historical trends and recommendations from two national commissions created by Congress (National Surface Transportation...
Policy and Revenue Study Commission and National Surface Transportation Infrastructure Financing Commission); further leveraging of existing local sales tax measures; value capture strategies; potential national freight program/freight fees; as well as passenger and commercial vehicle tolls for specific facilities. Reasonably available revenues also include innovative financing strategies, such as private equity participation. In accordance with federal guidelines, the plan includes strategies for ensuring the availability of these sources.

Figures 2-3 and 2-4 provide a breakdown of the expenditures and revenues of the 2012 RTP/SCS.

**FIGURE 2-3. 2012 RTP/SCS REVENUE SUMMARY - $524.7 BILLION, FY2011-FY2035**

<table>
<thead>
<tr>
<th>Source</th>
<th>Amount (in billions)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core Federal</td>
<td>$33.0 (6%)</td>
<td></td>
</tr>
<tr>
<td>Additional Federal</td>
<td>$84.3 (16%)</td>
<td></td>
</tr>
<tr>
<td>Core State</td>
<td>$46.8 (9%)</td>
<td></td>
</tr>
<tr>
<td>Additional State</td>
<td>$83.2 (16%)</td>
<td></td>
</tr>
<tr>
<td>Core Local</td>
<td>$225.5 (43%)</td>
<td></td>
</tr>
<tr>
<td>Additional Local</td>
<td>$51.9 (10%)</td>
<td></td>
</tr>
<tr>
<td>Core Federal</td>
<td>$33.0 (6%)</td>
<td></td>
</tr>
</tbody>
</table>

**FIGURE 2-4. 2012 RTP/SCS EXPENDITURE SUMMARY - $524.7 BILLION, FY2011-FY2035**

<table>
<thead>
<tr>
<th>Category</th>
<th>Amount (in billions)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Debt Service</td>
<td>$45.1 (9%)</td>
<td></td>
</tr>
<tr>
<td>Capital Projects</td>
<td>$262.8 (50%)</td>
<td></td>
</tr>
<tr>
<td>O&amp;M Highway</td>
<td>$56.7 (11%)</td>
<td></td>
</tr>
<tr>
<td>O&amp;M Transit</td>
<td>$139.3 (27%)</td>
<td></td>
</tr>
<tr>
<td>O&amp;M Local Roads</td>
<td>$20.9 (4%)</td>
<td></td>
</tr>
</tbody>
</table>

**Recommended SCAG Action:** Continue current efforts.

**100% | TRANSPORTATION SYSTEMS MANAGEMENT AND OPERATIONS (SP-14)**

**SCORE: 15/15**

**INVEST Goal:** This criterion assesses whether an agency optimizes the efficiency of the existing transportation system.

**Strengths:** SCAG earned full marks in the “Transportation Systems Management and Operations” (TSM&O) criterion due to the RTP’s clear description of the region’s TSM&O policies, goals, and objectives, and as a result of working closely with partner implementing agencies via institutional arrangements to support the implementation of a comprehensive set of TSM&O strategies identified in the 2012 RTP/SCS.

These sets of strategies do not focus solely on expanding the system, but also considers how the region operates the system as a whole; how it deals with incidents such as accidents or special events, and how it provides information to the traveling public so people can make informed decisions about how, where, and when to travel. All of these strategies are based on a foundation of comprehensive system monitoring so that planning and implementing agencies can understand how the transportation system is performing and how it needs to be improved. This approach is based in part on work that Caltrans has done for many years to optimize the performance of the state highway system.

**Recommended SCAG Action:** Continue current efforts.

**100% | ANALYSIS METHODS (SP-13)**

**SCORE: 15/15**

**INVEST Goal:** This criterion evaluates whether an agency adopts and incentivizes best practices in land use, socioeconomic, and transportation systems analysis methods.

**Strengths:** SCAG met all requirements of the “Analysis Methods” criterion as a result of its significant ongoing investments to improve existing modeling tools and develop new tools. Assisted by an active task force of modeling experts from partner agencies, SCAG’s models and methodology are highly scrutinized on an ongoing basis.

In order to improve the regional travel demand model for use in the development of the 2012 RTP/SCS, SCAG assembled a peer review panel comprised of nationally-recognized experts in the fields of travel demand modeling and data collection and analysis. The panel was tasked with reviewing the overall model development program and validation with regard to state-of-the-practice for use in the transportation planning process. Expert panels were also convened to conduct detailed technical reviews for the congestion pricing models, heavy duty truck model enhancements, and activity-based modeling progress. The expert panels were comprised of local and national modeling and data experts. In addition, the SCAG Modeling Task Force, comprised of local modeling professionals, participated in the model review process.

One of the key factors behind the model update was SB 375, whose requirements were key topics for the peer review effort. As part of the model update, SCAG made major enhancements to the mode choice model component and to the heavy duty truck model, and also improved the sensitivities of the model to pricing strategies. These improvements allowed SCAG to better gauge the effects of various strategies that would help the region meet the requirements of SB 375 and improve the region’s sustainability.

**Recommended SCAG Action:** Continue current efforts.
time. A CSMP is a comprehensive, integrated management plan for increasing transportation options, decreasing congestion, and improving travel times in transportation corridors, and provides a framework for long-term corridor management, with a focus on operational improvements. The intention of the CSMP effort is to continually monitor system performance and identify system improvements that are lower-cost, relatively quick to implement, and less capital-intensive than major corridor widening and expansion projects. In the SCAG region, CSMPs were developed by Caltrans for a number of major corridors, with SCAG contributing funding toward two of the CSMPs. The CSMP recommendations for new investments (above and beyond any current commitments identified in the Federal Transportation Improvement Program or countywide long range plans) total approximately $840 million and are proposed for inclusion in the 2012 RTP/SCS.

- **Intelligent Transportation Systems**: ITS projects are designed to increase transportation efficiency, but are also being used for safety, security and emergency response. Because the successful operation of ITS projects usually depends upon coordination and communication between different agencies and the systems they operate, it is essential that there be a region-wide “framework for cooperation” to help achieve that coordination and communication in the most cost-effective manner. This framework is the Southern California Regional ITS Architecture. To monitor and manage the transportation system, Transportation Management Centers (TMCs) have been established in the four Caltrans Districts (7, 8, 11, and 12) serving the entire region. In addition, the City of Los Angeles maintains the Automated Traffic Surveillance and Control (ATSAC) system, and many cities have developed their own TMCs.

- **Non-Recurring Congestion Measurement**: SCAG recognizes non-recurring congestion as a major issue in the Region. In 2009, the estimated average percentage of congestion that was due to accidents or other incidents was approximately 45 percent. SCAG estimates lost capacity in the AM Peak Period, attributable largely to non-recurring incidents such as accidents, weather conditions, stalled vehicles, etc., could have the effect of the loss of approximately 286 lane miles of freeway capacity when it is needed the most. The cost of physically adding this lost capacity by expanding existing roadways would exceed $4 billion. In order to address the non-recurring congestion in a more coordinated and concerted effort over the long haul, SCAG has introduced a new performance metric that will track delay on the region’s highways due to non-recurring congestion over time. While SCAG does not have the jurisdiction nor the authority over first responders to highway incidents, SCAG recommends that these agencies develop and/or publicize existing performance measures for reducing the average response and clearance times for incidents.

- **Traveler Information Systems**: Through a variety of public and private information service providers, most of the current real time traffic detection for freeway and HOV system speeds, California Highway Patrol incident data, changeable message signs and transit information are available to travelers via the internet, handheld computers, pagers, smart phones, and other portable communications devices. The regional 5-1-1 system has been released to the public, providing information on regional congestion for trip planning as well as trip planning via Metro’s transit system. Research completed for SCAG in 2002 by the Volpe National Transportation Laboratory indicates that a high propensity of traveler information users will shift departure times, reduce or eliminate trips, and shift modes in response to real time congestion information. Much of this real-time traffic information is being archived as part of the Regional Integration of ITS systems by Los Angeles County Metropolitan Transportation Authority. The data will be used by transportation planning agencies throughout the region. Including improvements proposed in the CSMPs, the RTP includes $6.7 billion for Transportation System Management improvements, including extensive advanced ramp metering, enhanced incident management, bottleneck removal to improve flow (e.g. auxiliary lanes), the expansion of the integration of our traffic signal synchronization network, and data collection to monitor system performance. The efficiencies generated by these improvements are equivalent to increasing available freeway capacity by 5 percent.

**Recommended SCAG Action**: Continue current efforts.

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**100% | LINKING ASSET MANAGEMENT AND PLANNING (SP-15)**

**SCORE: 15/15**

**INVEST Goal:** This criterion tests whether an agency leverages transportation asset management data and methods within the transportation planning process to make informed, cost-effective program decisions and better use existing transportation assets.

**Strengths:** SCAG earned all possible points in the “Linking Asset Management and Planning” criterion as a result of its continued heavy focus on maintenance and preservation, as well as the asset management-based planning efforts of its implementing partners throughout the region.

The framework that guided investment decisions for the 2012 RTP/SCS region is itself based on a system management approach that aims to protect and maximize the productivity of existing transportation infrastructure before strategically expanding it. This approach recognizes that the region can no longer afford to rely on system expansion as the primary solution to its mobility and sustainability challenges. Rather, an integrated approach is needed, based upon comprehensive system monitoring and evaluation and the use of performance measures to ensure that the best-performing projects and strategies are included in the RTP/SCS. This approach, which is depicted in the mobility pyramid on page 12, resulted in the allocation of $217 billion, or almost half of all proposed RTP/SCS expenditures, to system preservation and maintenance.

**Recommended SCAG Action**: Continue current efforts.
Federal Highway Administration & the Southern California Association of Governments

80% | INTEGRATED PLANNING: ECONOMIC DEVELOPMENT AND LAND USE (SP-01)
SCORE: 12/15

INVEST Goal: This criterion evaluates whether an agency integrates RTPs with statewide, regional, and/or local land use plans and economic development forecasts and goals, and whether the agency proactively encourages and facilitates sustainability through the coordination of transportation, land use, and economic development planning.

Strengths: SCAG scored very high in the “Integrated Planning: Economic Development and Land Use” criterion as a result of three key factors: 1) the integration of transportation and land use planning that SCAG has performed for years; 2) the passage of SB 375, which pushed MPOs to work even more closely with local jurisdictions to reduce GHG emissions through integrated transportation, land use, housing, and environmental planning; and 3) an economic and job creation analysis that was developed as part of the 2012 RTP/SCS—the first time that a SCAG RTP had ever included such an analysis.

Since 2004, SCAG has worked closely with local jurisdictions to perform integrated land use and transportation planning through its Compass Blueprint program, which has served as a model for integrated planning and turning a regional vision into local reality. Guided by four core principles—mobility, livability, prosperity, and sustainability—the program has effectively given the region a “jump-start” in building its sustainable communities, and implementing the SCS required by SB 375 in partnership with SCAG’s local partners. At the core of Compass Blueprint are Demonstration Projects—incentive-based, voluntary partnerships between SCAG and local governments that apply innovative approaches and tools to local plans that support regional priorities. As of January 2012, SCAG has provided over $13.6 million in incentive funds for 134 Demonstration Projects in 95 jurisdictions. Projects have included transit-oriented development plans for station areas along new light-rail alignments, downtown revitalization efforts, community visioning projects in low-income communities, and other projects that support shared local and regional goals.

SB 375 pushed SCAG and its partner agencies to work even more closely than ever before, through its requirement for MPOs to develop an SCS that integrates transportation and land use strategies. SCAG had to work closely with partner agencies at both the local and state level in order to meet the following requirements of the SCS:

- Identify existing land use,
- Identify areas to accommodate long-term housing needs,
- Identify areas to accommodate an eight-year projection of regional housing needs,
- Identify transportation needs and the planned transportation network,
- Consider resource areas and farmland,
- Consider state housing goals and objectives,
- Set forth a forecasted growth and development pattern, and
- Comply with federal law for developing an RTP.

SCAG also coordinated the development of the 2012 RTP/SCS with economic development planning efforts, producing for the first time an economic and job creation analysis as part of the RTP/SCS. SCAG worked closely with economists to perform a detailed analysis in order to understand the short- and long-term economic impacts and benefits of the strategies proposed in the RTP/SCS. In the face of high unemployment, poverty, lack of job growth, waning competitiveness, aging infrastructure, and environmental challenges that have combined to present the region with unparalleled challenges, SCAG views the 2012 RTP/SCS as an economic development strategy in addition to a transportation, infrastructure, and sustainability strategy.

Areas of Improvement: INVEST identified one area of improvement with regard to SCAG’s integrated planning efforts, in that, in a strict sense, SCAG does not monitor progress against sustainability-related performance measures on an ongoing basis and is unable to demonstrate whether the region is on the path to achieve its goals and objectives or not.

Recommended SCAG Action: Continue current efforts.

SCAG is currently able to monitor the progress of the implementation of the projects proposed in the RTP/SCS. However, SCAG has not developed a specific method or process by which to monitor progress against sustainability-related performance outcomes, due largely to how new the SCS and its associated performance measures are. However, as SCAG develops the 2016 RTP/SCS, it plans to place an emphasis on assessing the region’s progress toward achieving the sustainability-related goals and objectives identified in the 2012 RTP/SCS.

73% | TRAVEL DEMAND MANAGEMENT (SP-09)
SCORE: 11/15

INVEST Goal: This criterion assesses whether an agency effectively reduces vehicle travel demand throughout the system via travel demand management (TDM) strategies.

Strengths: SCAG performed well in the “Travel Demand Management” criterion due to its development of clear TDM goals and as a result of working closely with partner implementing agencies to support the implementation of a number of TDM strategies. TDM is a critical program and the 2012 RTP/SCS recognizes that effective TDM programs can increase options for travelers and reduce per capita non-renewable energy consumption and emissions by efficient management of the demand on the transportation system. When work trips as well as discretionary trips are reduced and/or shifted to non-peak hours and at the same time transit use, carpooling, biking, and walking rise, the transportation system tends to operate more efficiently, bringing many benefits to the region. These benefits justify substantial public investment on effective TDM programs. The 2012 RTP/SCS commits $4.5 billion to fully implement TDM strategies throughout the region (a $3.4 billion increase from the 2008 RTP) in three overall areas:

1. Reduce the number of single-occupancy vehicle trips through Rideshare (carpooling and vanpooling).

INVEST identified one area of improvement in the “Travel Demand Management” criterion due to its development of clear TDM goals and as a result of working closely with partner implementing agencies to support the implementation of a number of TDM strategies.

INVEST Goal: This criterion assesses whether an agency effectively reduces vehicle travel demand throughout the system via travel demand management (TDM) strategies.

Strengths: SCAG performed well in the “Travel Demand Management” criterion due to its development of clear TDM goals and as a result of working closely with partner implementing agencies to support the implementation of a number of TDM strategies. TDM is a critical program and the 2012 RTP/SCS recognizes that effective TDM programs can increase options for travelers and reduce per capita non-renewable energy consumption and emissions by efficient management of the demand on the transportation system. When work trips as well as discretionary trips are reduced and/or shifted to non-peak hours and at the same time transit use, carpooling, biking, and walking rise, the transportation system tends to operate more efficiently, bringing many benefits to the region. These benefits justify substantial public investment on effective TDM programs. The 2012 RTP/SCS commits $4.5 billion to fully implement TDM strategies throughout the region (a $3.4 billion increase from the 2008 RTP) in three overall areas:

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

Among the three areas above, the 2012 RTP/SCS proposes the following strategies to expand and encourage implementation of TDM strategies to their fullest extent:

- Rideshare incentives/Rideshare matching
- Parking management and parking cash-out policies
- Preferential parking or parking subsidies for carpoolers
- Promotion and expansion of Guaranteed Ride Home program
- Telecommuting incentives
- Flexible work schedules
- Integrated mobility hubs
- Other First Mile/Last Mile Strategies
- Incentives for employees who bike to work
- Investments in bicycling and pedestrian infrastructure.

**Areas of Improvement:** SCAG fell short in that the 2012 RTP/SCS did not include a clearly-delineated robust package of TDM strategies, did not have TDM performance measures, and because SCAG is not conducting ongoing monitoring of its TDM program.

**Recommended SCAG Action:** Continue current efforts.

As seen in the “Strengths” section above, the list of TDM strategies encouraged by SCAG is quite robust. However, SCAG’s abilities are limited in that it does not directly implement the TDM programs. Therefore, there is a limitation on the level of detail that can be incorporated in the long-range plan that will assist the implementing agencies in crafting these programs. For the same reason, it would not be practical for SCAG to set a clear breakdown of investments by strategy all the way through the RTP’s horizon year of 2035, thereby making local-centric decisions today that SCAG’s partner implementing agencies should have the authority and flexibility to make in the years ahead. As a non-implementing agency, SCAG has also stayed away from setting TDM performance standards that the region’s implementing agencies would then be committed to achieving. Instead, SCAG believes that it should preserve maximum flexibility for the implementing agencies to develop these strategies that are most relevant and feasible within the jurisdiction of each of the implementing agencies taking into account their unique characteristics. SCAG should strive to work more closely with the implementing agencies to develop, implement, and monitor the performance of the TDM strategies in the future.

**60% | ACCESS AND AFFORDABILITY (SP-05) **

**SCORE: 9/15**

**INVEST Goal:** This criterion tests whether an agency enhances the accessibility and affordability of the transportation system to all users and by multiple modes.

**Strengths:** SCAG earned 9 out of 15 points in the “Access and Affordability” criterion primarily for the extensive Environmental Justice analysis performed as part of the 2012 RTP/SCS. SCAG utilized the travel demand model and other data to quantitatively evaluate both the positive and negative impacts of transportation decisions on low-income and minority communities. SCAG performed a detailed analysis of existing social and environmental equity in the region and of the impacts of the 2012 RTP/SCS on various Environmental Justice population groups using the following 11 performance metrics:

1. RTP/SCS Revenue Sources In Terms of Tax Burdens
2. Share of Transportation System Usage
3. RTP/SCS Investments
4. Impacts of Proposed VMT Fees
5. Distribution of Travel Time Savings and Travel Distance Reductions
6. Jobs-Housing Imbalance or Jobs-Housing Mismatch
7. Accessibility to Employment and Services
8. Accessibility to Parks
9. Gentrification and Displacement
   a. Air Quality and Health Impacts
      » Historic Performance At the Regional Level
      » Environmental Impacts along Freeways and Highly Traveled Corridors
      » Environmental impacts of Plan and Baseline Scenarios
   b. Noise impacts
      » Aviation
      » Roadway
11. Rail-related Impacts

The analysis found that the 2012 RTP/SCS results in air quality improvements for Southern California and improves Environmental Justice outcomes in the region by providing equitable benefits for various population groups according to income and ethnicity.

**Areas of Improvement:** SCAG lost points for not analyzing how its transportation planning documents address or improve issues such as access to commercial centers, jobs, hospitals, schools, and other civic institutions and social and emergency services; the affordability of travel choices; and the affordability of housing through its relationship to transportation investments. SCAG’s score also suffered from the RTP/SCS’s lack of sustainability-related performance measures that can be used to monitor the effects of plan implementation on transportation accessibility and affordability. These are analyses that SCAG agrees would be beneficial to the regional transportation planning process; however, they would require extensive additional resources and data that may not be available to SCAG in the near future.

**Recommended SCAG Action:** Continue current efforts.

SCAG has always and will continue to improve its Environmental Justice work based on feedback from the environmental justice community regarding key access and affordability issues that pertain to the region’s residents.
**60% | SAFETY PLANNING (SP-06)  
SCORE: 9/15**

**INVEST Goal:** This criterion evaluates whether an agency integrates quantitative measures of safety into the transportation planning process, across all modes and jurisdictions.

**Strengths:** SCAG scored 9 out of 15 points in the “Safety Planning” criterion for actively collaborating in the creation of the State Highway Safety Plan (SHSP), integrating safety performance measures into the transportation planning process, and maintaining GIS-based safety data for use in the planning process. As part of these efforts, SCAG set over 50 recommendations to local jurisdictions regarding various policies and actions that would complement the SHSP’s policies and actions, and included these recommendations in the 2012 RTP/SCS.

**Areas of Improvement:** SCAG suffered from a number of reasons, primarily from not having a clear path toward linking specific safety strategies with integrated advanced, statistically sound, quantitative methods to establish project performance and selection criteria.

**Recommended SCAG Action:** Continue current efforts. The challenge lies primarily in SCAG’s limited role as a planning agency that is not directly responsible for developing and/or implementing specific safety projects. However, this assessment does suggest that there is some room for SCAG to enhance its safety performance measures at a planning level from a system perspective utilizing more robust and sound tools and statistical techniques. SCAG can make conscious efforts to work with its federal and state partners to strengthen this important area of performance in the long-range transportation planning process, particularly in light of new requirements pursuant to MAP-21.

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**60% | ENERGY AND FUELS (SP-11)  
SCORE: 9/15**

**INVEST Goal:** This criterion assesses whether an agency reduces energy and fossil fuel consumption from the transportation sector and document it in the transportation planning process.

**Strengths:** SCAG received 9 out of 15 points in the “Energy and Fuels” criterion by utilizing its travel demand model to forecast energy and fuel consumption in order to inform the development of the 2012 RTP/SCS, and by working with partner agencies to implement strategies that will allow the region to meet GHG emission targets set in the RTP/SCS.

SCAG, which has been developing and improving travel demand forecasting models since 1967, most recently put its latest model through an extensive peer review test in June 2011. This effort sought to improve the ability of the model to forecast various sustainability-related metrics, including fuel consumption and VMT, which is used to forecast GHG emissions. SCAG’s regional transportation modeling area, which covers the entire six-county region, is now divided into a record 11,267 transportation analysis zones (TAZ’s) with an additional 40 external cordon stations, 12 airport nodes, and 31 port nodes for the Ports of Los Angeles and Long Beach.

**Areas of Improvement:** SCAG, however, has not developed energy reduction goals, and did not include energy and fossil fuel reduction strategies in the 2012 RTP/SCS (it included it in the PEIR instead). As such, SCAG currently is unable to document the strategic reduction of fossil fuel consumption in the region.

**Recommended SCAG Action:** Continue current efforts. SCAG has only begun to focus on energy and fossil fuel reduction in the context of the regional transportation planning system, and is therefore in the early stages of exploring the best role for SCAG as a regional agency in guiding the region toward reduced energy and fossil fuel dependence. At some point in the future, SCAG may find itself facilitating the development of specific energy and fossil fuel reduction goals.

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**53% | INTEGRATED PLANNING: NATURAL ENVIRONMENT (SP-02)  
SCORE: 8/15**

**INVEST Goal:** This criterion evaluates whether an agency integrates ecological considerations into the transportation planning process, including the development of the RTP and TIP. It also measures whether an agency proactively supports and enhances long-term ecological function through the coordination of transportation and natural resource planning.

**Strengths:** SCAG earned 8 out of 15 points in the “Integrated Planning: Natural Environment” criterion by developing goals and objectives to integrate the 2012 RTP/SCS with environmental plans, policies, and goals, and by supporting the implementation of projects that enhance long-term ecological function.

A large part of this work is performed as part of the air quality conformity analysis and the Program Environmental Impact Report (PEIR) for the 2012 RTP/SCS required under the California Environmental Quality Act (CEQA). Both efforts were undertaken in close consultation with natural resource agencies and seek to promote long-term ecological function. The air quality conformity analysis focuses on ensuring the region’s compliance with federal and state air quality standards, while the PEIR evaluates the overall potential environmental impacts associated with the adoption of the RTP/SCS, and includes avoidance and/or mitigation measures designed to help avoid or minimize significant environmental impacts.

**Recommended SCAG Action:** Continue current efforts. SCAG lost a number of points for not going above and beyond consultation requirements by regularly engaging a comprehensive spectrum of natural resource and regulatory agencies outside of the air quality arena, for not using natural resource data to identify opportunities to avoid and/or minimize potential impacts of planned transportation projects to the natural environment outside of air quality impacts, for not identifying opportunities to support and enhance long-term sustainable ecological function outside of air quality through planned transportation investments, and for not including performance measures for long-term ecological function.
**Recommended SCAG Action:** Continue current efforts.

When it comes to air quality, SCAG does regularly engage certain natural resource and regulatory agencies throughout the transportation process, including ARB and EPA. However, with regards to broader natural resources and long-term ecological protection issues, given the vast size of the SCAG region and the stringent environmental analyses required under CEQA, SCAG has found that the required project-specific analyses are the most practical and appropriate means by which to ensure that the region’s major transportation projects are coordinated with natural resource protection efforts in Southern California.

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**53% | LINKING PLANNING AND NEPA (SP-17)**

**SCORE: 8/15**

**INVEST Goal:** This criterion tests whether an agency integrates transportation system planning process information, analysis, and decisions with the project-level environmental review process, and reference it in NEPA documentation.

**Strengths:** SCAG earned 8 out of 15 points in the “Linking Planning and NEPA” criterion by documenting linkages between regional transportation planning and NEPA and by working with implementing agencies on an as-needed basis to utilize system planning information and documentation for project-level NEPA documents.

This process is guided by SCAG’s Regionally Significant Transportation Investment Studies (RSTIS) Coordination Process, which is intended to provide a forum for coordination and discussion around the preparation of major corridor studies to ensure the following objectives:

- Regional partners are informed regarding major corridor studies and area plans underway in the SCAG region;
- Major corridor studies and area plans include consideration of how projects support regional goals and objectives; and
- Major corridor studies and area plans are prepared in a manner consistent with recent Federal guidance and state legislation, specifically:
  - Federal guidance on linking planning and NEPA
  - Greenhouse gas legislation
  - Corridor System Management Plans (CSMP)

**Areas of Improvement:** SCAG fell short of INVEST requirements by not producing documentation of transportation system planning decisions that assist in meeting NEPA documentation requirements (for example, purpose and need statements for major projects recommended in the RTP or the examination and elimination of alternatives at the system level), by not fully integrating NEPA practitioners into the transportation system planning process, and by not fully integrating system-level transportation planning information and documentation in the project-level NEPA documents developed throughout the region.

**Recommended SCAG Action:** Continue current efforts.

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**33% | MULTIMODAL TRANSPORTATION AND PUBLIC HEALTH (SP-07)**

**SCORE: 5/15**

**INVEST Goal:** This criterion assesses whether an agency expands travel choices and modal options by enhancing the extent and connectivity of multimodal infrastructure, and whether the agency supports and enhances public health by investing in active transportation modes.

**Strengths:** SCAG earned 5 out of 15 points in the “Multimodal Transportation and Public Health” criterion by developing transit and active transportation connectivity goals in the 2012 RTP/SCS, by engaging public health and active transportation stakeholders throughout the entire transportation planning process, and by prioritizing active transportation projects in the RTP/SCS.

In large part as a result of the passage of SB 375, the development of the 2012 RTP/SCS saw SCAG engage public health and active transportation stakeholders like never before to develop ways to promote greater widespread use of healthier and more sustainable modes of transportation. As a result, the 2012 RTP/SCS allocates over $6 billion for active transportation improvements—almost triple the amount in the previous RTP. A substantial part of this investment is proposed to be used to complete gaps in local bikeway networks and develop a regional bikeway network, as depicted in the map on page 15.

**Areas of Improvement:** At the same time, SCAG has not placed an emphasis on public health in the 2012 RTP/SCS. SCAG did not evaluate the public health impacts of the RTP/SCS, has not incorporated multimodal or public health-related performance measures in the RTP/SCS, and cannot demonstrate that the region is meeting its multimodal and public health goals and objectives. Regarding active transportation, SCAG’s discussion of intermodal connectivity and the incorporation of first/last-mile strategies into the RTP/SCS are considered to be in the early stages of development.

**Recommended SCAG Action:** Continue current efforts.

During the development of the 2012 RTP/SCS, SCAG held extensive discussions with its stakeholders on the role of public health in the transportation planning process. While SCAG supports the goal of promoting public health, additional analysis is required as to specifically how the region can best measure its progress toward the improvement of public health. The discussion around public health-related performance measures is likely to strengthen in the development of the 2016...
RTP/SCS, leading to the integration of more specific and robust public health outcomes.

0% | INTEGRATED PLANNING: BONUS (SP-04)
SCORE: 0/10

INVEST Goal: This criterion tests whether an agency has a continuing, cooperative, and comprehensive (3-C) transportation planning process, and whether planners and professionals from multiple disciplines and agencies (e.g., land use, transportation, economic development, energy, natural resources, community development, equity, housing, and public health) work together to incorporate and apply all three sustainability principles when preparing and evaluating plans.

Although SCAG believes that it meets the requirements of this criterion, it does not meet the INVEST prerequisites to be able to answer this question. INVEST requires a score of 10 or higher on each of the first three criteria. SCAG fell short in Criterion SP-02:

- SP-01: Integrated Planning: Economic Development and Land Use
  ✔ SCAG score: 12/15 | Requirement met
- SP-02: Integrated Planning: Natural Environment
  ✗ SCAG score: 8/15 | Requirement not met
- SP-03: Integrated Planning: Social
  ✔ SCAG score: 15/15 | Requirement met

Strengths: N/A
Areas of Improvement: N/A

0% | INFRASTRUCTURE RESILIENCY (SP-16)
SCORE: 0/15

INVEST Goal: This criterion assesses whether an agency anticipates, assesses, and plans to respond to vulnerabilities and risks associated with current and future hazards (including those associated with climate change) to ensure multi-modal transportation system reliability and resiliency.

Strengths: None.

Areas of Improvement: SCAG scored no points in the “Infrastructure Resiliency” as the agency simply has not focused on this area in the past. However, it should be noted that SCAG recently received a grant from the California Department of Transportation (Caltrans) to study climate change adaptation and resiliency with a focus on local transit systems.

Recommended SCAG Action: Utilize the recently received Caltrans grant indicated above as a first step to beginning work on the region’s infrastructure resiliency, and consider follow-up efforts to explore resiliency beyond climate change adaptation and local transit systems.
SUMMARY OF STRENGTHS

The results reveal several strengths in SCAG’s current long-range transportation planning process—out of a total of 17 INVEST criteria, SCAG earned perfect scores in seven (7) criteria. SCAG’s success can be attributed to a number of key factors, as outlined below.

- **California’s Sustainable Communities and Climate Protection Act - Senate Bill 375 (SB 375):** As seen in the “Criteria-by-criteria Evaluation” section, SB 375 played a large role in pushing SCAG to broaden the regional stakeholders and work more closely with them with a renewed focus on sustainable transportation investments. Not only was SCAG given ambitious sustainability targets to meet, but they were also targets that could not be met without integrating four types of planning traditionally performed by distinctly different agencies—transportation planning is typically performed by SCAG and the six county transportation commissions, land use and housing planning is performed by the counties and local jurisdictions, and environmental planning by state and regional regulatory agencies. Therefore, the success of the region in meeting SB 375 requirements hinged upon SCAG’s ability to bring all relevant agencies together to develop the RTP/SCS as a region. In the end, SB 375 pushed the Southern California region to collaboratively develop a 2012 RTP/SCS that exceeded the SB 375 requirements—and earned it the top Platinum rating in INVEST.

- **Investment-Driven Results:** SCAG’s INVEST results also demonstrate a strong correlation between funding and success, as many of the high-scoring criteria reflect areas of expertise and leadership that SCAG invested substantial resources over the course of many years to develop and maintain. Examples include the following:
  - **Freight and Goods Movement (SP-08):** SCAG has invested millions of dollars over the past several decades to develop what is now its comprehensive FreightWorks program. FreightWorks spans Southern California’s complex web of public and private agencies and goods movement operators and aims to ensure the optimization of the goods movement industry, which is essential to support the economy and quality of life of the SCAG region. As a result of the extensive investment and work in this program, SCAG easily earned a perfect INVEST score in the “Freight and Goods Movement” criterion.
  - **Financial Sustainability (SP-12):** SCAG has not only invested large amounts of human and financial capital in the development of regional revenue forecasts and cost estimates, but has also recently undertaken an extensive multi-year Express Travel Choices Study, which aims to understand how value pricing and other congestion management approaches can improve travel conditions, the economy, and public health in the region, and which will identify strategies and specific implementation actions that could be pursued over the long term. SCAG’s extensive work in many areas related to financial sustainability earned it full marks in the “Financial Sustainability” criterion.
  - **Analysis Methods (SP-13):** SCAG has invested millions of dollars over the past several years to not only improve the accuracy and robustness of its existing regional travel demand model, but also to stay at the forefront of the development of new models and tools by which to measure the sustainability impacts of transportation strategies. Even as it continued to develop new complex models that were years away from completing, SCAG was developing
new tools that allowed it to analyze investments based on a host of sustainability-oriented metrics. SCAG’s investments in this area earned the agency all possible points in the “Analysis Methods” criterion.

- **Balanced Approach to Planning:** The seven (7) criteria that SCAG earned perfect scores in fall within very different areas of the planning spectrum (for example, “Integrated Planning: Social” and “Financial Sustainability”). This serves as an indicator of SCAG’s broad spectrum of expertise and the agency’s balanced approach to regional planning.

**SUMMARY OF AREAS OF IMPROVEMENT**

On the other hand, INVEST revealed a number of areas of improvement in SCAG’s regional planning process, most of which are a result of SCAG’s limited authority in implementing projects and programs as a regional planning agency for a vast six-county region. The following challenges partially explain why SCAG did not earn higher INVEST scores:

- **Institutional challenges:** SCAG’s lack of authority to implement projects and programs as a regional planning agency requires that SCAG work closely with the implementing agencies to translate the RTP/SCS into specific actions on the ground. Given the geographic and institutional diversity of the SCAG region, this is easier said than done. The implementation of most of the regional strategies in the RTP/SCS requires participation and consensus of multiple agencies, posing tremendous institutional challenges to bring plans to fruition.

- **Data challenges:** Data and analytics are keys to informing critical investment and policy decisions. While SCAG is at the forefront of data and analytics, data availability is always an ongoing challenge. There is always need for additional data to be able to paint a complete picture of sustainable planning practices. The data challenges refer to a lack of available data that can be used to inform decisions or monitor the progress of a certain sustainability goal.

- **Resource challenges:** Resource constraints are an all-too-familiar issue across all governmental entities. Here, resource challenges refer specifically to a lack of resources on SCAG’s part to pursue certain time- and resource-consuming efforts.

Table 3-1 highlights challenges associated with most of the ten (10) criteria containing areas of improvement experiencing two or more of the challenges mentioned above:

<table>
<thead>
<tr>
<th>Score</th>
<th>Criteria</th>
<th>Institutional</th>
<th>Data</th>
<th>Resource</th>
</tr>
</thead>
<tbody>
<tr>
<td>80%</td>
<td>SP-01: Integrated Planning: Economic Development &amp; Land Use</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>73%</td>
<td>SP-09: Travel Demand Management</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>60%</td>
<td>SP-05: Access and Affordability</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>60%</td>
<td>SP-06: Safety Planning</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>60%</td>
<td>SP-11: Energy and Fuels</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>53%</td>
<td>SP-02: Integrated Planning: Natural Environment</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>53%</td>
<td>SP-17: Linking Planning and NEPA</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>33%</td>
<td>SP-07: Multimodal Transportation and Public Health</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>0%</td>
<td>SP-04: Integrated Planning: Bonus</td>
<td>N/A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0%</td>
<td>SP-16: Infrastructure Resiliency</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

It is evident that multiple challenges would need to be overcome in order for SCAG to improve in the areas identified by INVEST. As seen in the previous “Criteria-by-criteria Evaluation” section, SCAG is already doing most of what it is able to accomplish given its institutional, data, and resource limitations.

As it relates to areas of improvement identified by INVEST for SCAG to monitor the region’s progress in meeting various sustainability goals and metrics, this is a direction that SCAG has begun to move toward as a result of SB 375, and will continue to build upon in the coming years.

One INVEST criteria stood out among the others as a major opportunity area for the agency: Infrastructure Resiliency (SP-16). SCAG earned 0 points in this criterion—the only non-bonus criterion that it did not earn any points in. This will be discussed in greater detail in the next section.

**Recommended SCAG Action: Consider Infrastructure Resiliency in SCAG’s Future Planning Efforts**

As summarized above, while INVEST confirms SCAG’s core strengths in sustainable planning practices, the tool also revealed a number of areas where SCAG has room for improvement. The assessment of the 2012 RTP/SCS provided a lot of “food for thought.” Particularly, one area that stood out among the rest was the zero score that SCAG received in Infrastructure Resiliency.

The goal of Infrastructure Resiliency as stated in INVEST is:
“Anticipate, assess, and plan to respond to vulnerability and risks associated with current and future hazards (including those associated with climate change) to ensure multi-modal transportation system reliability and resiliency.”

Vulnerability and risks could come in different forms, not just from sudden and unexpected events such as earthquake, extreme weather, or climate change. It could also come from long-term neglect of infrastructure maintenance due to chronic underfunding. Regardless of the source of vulnerability, it is clear that planning for Infrastructure Resiliency is fundamental to ensuring the maintenance of a sustainable transportation system. As pointed out by INVEST, there are several tasks that must be undertaken as a part of Infrastructure Resiliency planning:

- System-level assessment of potential hazards such as seismic events, relative sea level rise, storm activity/intensity, temperature and heat waves, precipitation events, lake levels, stream flows etc.
- Identify locations potentially vulnerable and/or at risk as a result of current and future hazards, and include a discussion of the potential implications on the transportation system in the future LRTP, or other appropriate transportation planning document.
- Conduct a vulnerability assessment and consider hazard consequences for some of its planned, programmed, and existing facilities, particularly focusing on the weak points in the system.
- Develop adaptation plans and strategies to address vulnerabilities and risks associated with hazards, identify key stakeholders and a game plan to engage them in the process.

While the eventual goal of SCAG should be to undertake all of these tasks and integrate an Infrastructure Resiliency plan into the long-range transportation plan, it will likely take a substantial amount of time, resources, and planning to get there. Therefore, in the near term, as a starting point, the team recommends that SCAG develop a white paper to assess the feasibility of developing a Regional Infrastructure Resiliency plan. The white paper could, at a minimum, address the following issues:

- Statement of problem
- Potential goals and objectives
- SCAG’s role
- Identification of key stakeholders, roles and responsibilities, and an engagement plan
- Identification of resource, commitments, and potential time needed
- Scope of work for developing such a plan

Related to Infrastructure Resiliency, SCAG recently received a grant from the California Department of Transportation (Caltrans) to study climate change adaptation and resiliency with a focus on local transit systems, and could potentially utilize this grant as a first step to beginning work on the region’s infrastructure resiliency. As this work commences, SCAG should consider how this work will fit into the larger framework of the Regional Infrastructure Resiliency Plan.
ASSESSMENT OF INVEST AS A SYSTEM PLANNING TOOL

All in all, INVEST is a valuable tool that seems to reasonably identify a region’s strengths and weaknesses as it pertains to the system planning process. The tool is very comprehensive and provides an opportunity for any agency engaged in planning or delivering transportation projects to take an honest look at its practices and conduct an evaluation of how well it is doing in achieving its goals using sustainable strategies.

From the standpoint of a regional planning agency primarily responsible for developing long range plans with very little to no implementation authority, the team found that there was a lack of clarity about whether INVEST is intended to measure the sustainability efforts of a region—as a region—or the metropolitan planning organization as an agency. Clarifying this nuance could help INVEST provide a more accurate picture of how well a region (or agency) is planning for sustainability.

As far as the user friendliness of the tool, the team reviewed both Versions 1.0 and 1.1 of INVEST, and found that Version 1.1 makes improvements that move INVEST in the right direction as it relates to user friendliness. However, the team identified some additional areas of improvement in the hopes of helping FHWA make INVEST an even easier tool for future users.

APPLICABILITY OF INVEST TO REGIONAL TRANSPORTATION PLANNING

INVEST appeared to reasonably point out the strengths and weaknesses of SCAG’s current long-range transportation planning processes. High scores were attained in areas that SCAG has been recognized by other outside parties for having gone above and beyond current requirements, and low scores were assigned in areas in which SCAG admittedly has room for improvement.

Misleading Scores
At the same time, there are a few types of questions that are somewhat ambiguous and which could lead to misleading scores.

Measuring Regions or Measuring Agencies
Several criteria in the System Planning module ask whether the agency “implements” a strategy or program. As an MPO that has very little to no implementation authority, the team found it difficult to answer such questions with a high degree of confidence. Clarification should be provided as to whether an agency with no implementation authority should answer positively if other agency/ies within the region are implementing the strategy, or whether it should answer negatively to all questions regarding implementation. Ultimately, the overarching question is whether INVEST is intended to recognize regions
for implementing sustainable strategies or penalize agencies that do not implement such strategies (even if they are legally unable to do so).

### Misleading Scores from Lack of Partial Credit Options

There are also some areas in which INVEST’s point system can be too simplistic and, as a result, misleading. Two examples include the following:

- **In Criterion SP-05: “Access and Affordability,”** the fourth question asks whether “[t]he LRTP includes an analysis of the three dimensions of accessibility and identifies specific population groups or areas where access is an issue.” Two points are awarded for a “yes” response and zero for a “no” response. Since there is no option for an agency to take partial credit for including an analysis of just one or two of the indicated dimensions, an agency can take full credit even if it addresses only one or two dimensions.

- **In Criterion SP-15: “Linking Asset Management and Planning,”** the first question allows an agency to score full marks if it “has identified at least one performance measure for each asset management goal and objective in order to track progress over time.” Similar to the above example, an agency with just one asset management goal and associated performance measure would therefore be able to answer positively and score all possible points for this question, when in reality, it could have significant room for improvement in the management of many other types of assets—the question itself lists a number of areas for which asset management goals and performance measures can be set, including “pavement condition; bridge condition; remaining service life; percentage of total planned maintenance complete; cost-effectiveness; route continuity; corridor completion; state of good repair for transit rolling stock, signal systems, guideways, and facilities; and sidewalk and bicycle inventories.”

Complex questions such as these should allow for partial credit, thereby producing scores that more accurately reflect room for improvement, if any.

### USER FRIENDLINESS OF INVEST

INVEST’s online user interface is generally user-friendly and runs quickly on a normal computer. The instructions in the System Planning module are also relatively clear and easy to understand. At the same time, the team noted a number of areas that could be improved. This feedback is outlined below in the hopes of improving the INVEST experience for future users.

#### Ambiguous Questions

While most questions are easy to understand, SP-03: “Integrated Planning: Social” contains a few confusing questions:

- Does the LRTP include sustainability-related performance measures to assess the effectiveness of its public involvement process?
- Does the agency monitor the effectiveness of its public involvement process against the performance measures, make changes to improve the process as needed, and demonstrate sustainable outcomes?

It is unclear how sustainability-related performance measures can be used to assess the effectiveness of the public involvement process, and how monitoring the effectiveness of the public involvement process can demonstrate sustainable outcomes. The team suggests clarifying these questions in INVEST.

#### Criterion Webpage Layout

While the criterion webpages are generally well-organized, the team noted a few suggestions related to their layout in order to improve clarity and the user experience.

- **“Criterion Details” and “Criterion Scoring” Visual Mismatch**

Each criterion webpage contains a “Criterion Details” section on the left side of the page that contains detailed guidance on how to answer each question, and a “Criterion Scoring” section on the right side of the page that contains the question and response radio buttons. However, as seen in Figure 3-1, these sections are not vertically aligned. Therefore, the team found it time-consuming to scroll between the two sections for each question to ensure that the detailed guidance for each question was fully understood prior to entering the response. The guidance and scoring sections should be vertically aligned or combined into a single area for ease of use.
Assessing Sustainable Planning in Southern California  |  Assessment of INVEST as a System Planning Tool

Use of INVEST to Inform the 2016 RTP/SCS

Criterion Details and Criterion Scoring Visual Mismatch

Each criterion webpage contains a “Criterion Details” section on the left side of the page that contains detailed guidance on how to answer each question, and a “Criterion Scoring” section on the right side of the page that contains the question and response radio buttons. However, as seen in Figure 3, these sections are not vertically aligned. Therefore, the team found it time-consuming to scroll between the two sections for each question to ensure that the detailed guidance for each question was fully understood prior to entering the response. The guidance and scoring sections should be vertically aligned or combined into a single area for ease of use.

Figure 3. Screenshot of Criterion Details and Criterion Scoring Visual Mismatch

Question-Specific “Scoring Notes” and “Next Actions”

As seen in Figure 3-2, each criterion webpage contains “Scoring Notes” and “Next Actions” sections that allow users to enter general notes and next actions for the criterion. It would be helpful if users could also be allowed to enter scoring notes and next actions for each question, as some notes and follow-up actions only apply to a specific question and not others on the criterion webpage (i.e. a note indicating the rationale behind a response to a specific question, or a next action indicating follow-up work to address an inadequacy identified by a specific question). In addition, a “flag” function for each question could also help users denote specific areas requiring follow-up action.

Figure 3-2. Screenshot of Scoring Notes and Next Actions
Summary Points

As seen in Figure 3-3, the Scorecard homepage displays the total points earned, criterion-specific points earned, and total criterion points possible. However, as seen in Figure 3-4 the criterion webpages do not display any of this information. Since users spend an extensive amount of time on the criterion webpages, it would be helpful for the criterion webpage to display this summary point information as well.

Multi-User Collaboration

The team commends FHWA for including in Version 1.1 the ability for multiple users to work on a single INVEST project. This is helpful for many agencies, including SCAG, in which responses need to be solicited from a number of staff members working across various planning functions and analyzed in order to determine the final agency responses. However, in addition to the ability for multiple people to score a single project, agencies also need to be able to track responses by responder in order to identify the source of, and resolve inconsistencies between scores. The team recommends that INVEST explore methods by which to allow for the tracking of multiple responses.

For FHWA’s reference, the team collaborated across multiple users by manually creating an Excel spreadsheet that allowed each user to select a response for each question (with the choices being YES, NO, MAYBE, and N/A) and indicate the rationale for his/her response. See Figure 3-5 for a screenshot of this spreadsheet.
Use of INVEST to Inform the 2016 RTP/SCS

The team recommends that INVEST explore methods by which to allow for easier multi-user collaboration. For FHWA's reference, the team collaborated across multiple users by manually creating an Excel spreadsheet that allowed each user to select a response for each question (with the choices being YES, NO, MAYBE, and N/A) and indicate the rationale for his/her response. See Figure 7 for a screenshot of this spreadsheet.

Not only did this format work well for the users, but it also allowed the SCAG INVEST project team to compile and analyze responses from multiple responders. Having all the responses in Excel format allowed the team to generate summary data in order to easily view similarities and differences in responses (see Figure 3-6).

Scorecard Output

Despite the overall user friendliness of the scoring input webpages, the tool is noticeably lacking in output options. As seen in Figure 9, an HTML-based webpage is the only method by which to generate a report showing an agency's INVEST results.

Summary of Responses

Not only did this format work well for the users, but it also allowed the SCAG INVEST project team to compile and analyze responses from multiple responders. Having all the responses in Excel format allowed the team to generate summary data in order to easily view similarities and differences in responses (see Figure 3-6).
Scorecard Output
The team also commends FHWA for adding in Version 1.1 the ability for users to generate a comma-separated values (CSV) file. However, the CSV file outputs scores only by high-level criteria, and users must rely on an HTML-based webpage (Figure 3-7) to view detailed results.

FIGURE 3-7. SCREENSHOT OF SCORECARD RESULTS

Use of INVEST to Inform the 2016 RTP/SCS - Mar 21, 2015

Module: System Planning
Points: 163
Achievement Level: Exceptional

Criteria
SP-01 Integrated Planning: Economic Development and Land Use
Integrate statewide and metropolitan long-range transportation plans (LRTP) with statewide, regional, and/or local land use and economic development plans and policies. Proactively encourage sustainable development through the coordination of transportation, land use, and economic development plans.

SP-01.3 Are the goals and objectives consistent with applicable economic development and land use plans above and beyond current requirements? - 0 points
Yes

SP-01.2a Does the agency regularly engage land use and economic development agencies in its jurisdiction throughout the transportation planning process? - 0 points
Yes

SP-01.2b Does the agency utilize institutional mechanisms to facilitate the engagement? - 0 points
Yes

SP-01.3 Does the agency use best practice quantitative methods to analyze and evaluate the performance of alternative land use/transportation scenarios? - 0 points
Yes

SP-01.4 Does the agency provide institutional leadership in encouraging transportation planning that is consistent with land use and economic development plans and that supports sustainability principles? - 0 points
Yes

SP-01.5 Can the agency demonstrate sustainable outcomes? - 0 points
Yes

The team proposes that a detailed spreadsheet-based output be made available in addition to the high-level CSV file. Figure 3-8 shows a potential spreadsheet format that could be used to display results.

FIGURE 3-8. SCREENSHOT OF PROPOSED DETAILED SCORECARD SPREADSHEET
The proposed format would utilize a similar level of detail as the existing HTML-based output webpage, and utilize one row for each question that contains the following information for that question:

- **Criteria/Sub Criteria**
- **Strengths**
- **Weaknesses**
- **Points Earned**
- **Total Possible Points**
- **Scoring Notes**
- **Next Actions**

Summary scores for each criterion could be provided at the top of each criterion section, and color-coded green “Strengths” and red “Weaknesses” columns would help to provide an easy-to-skim snapshot at how well an agency fared in each criterion section. A major added benefit to using a spreadsheet format is the ability of agencies to easily extract INVEST scoring results for further analysis.

**MISCELLANEOUS**

The team also identified a few miscellaneous suggestions and issues regarding INVEST:

**Change Password Functionality**

INVEST does not allow users to change their assigned passwords. The team suggests that a change password function be implemented so that users are able to select a password that they may remember more easily. Furthermore, in the event that the assigned password becomes inadvertently shared, the ability to change a user’s password would provide greater security.

**Duplicate Question**

The Criterion SP-3: “Integrated Planning: Social” webpage contains a duplicate question (“Does the agency include an education component?”) along with an associated duplicate possible point.

**Scoring Totals Inconsistencies**

On the Criterion SP-15: “Linking Asset Management and Planning” and the Criterion SP-17: “Linking Planning and NEPA” webpages, the total possible number of points based on the “Criterion Details” section is 15, while the total possible points in the “Criterion Scoring” section is 10. This can lead to inconsistent total scores—in SCAG’s case, the INVEST summary score showed 168 points although the correct score based on the actual possible totals was 176.
The SCAG team found the use of INVEST to be an enlightening experience that allowed SCAG to gauge its recent regional transportation planning efforts against the national sustainability mindset. The team was thrilled to earn a Platinum rating, and found it beneficial to discover new areas of improvement that can help the region to achieve a more sustainable future. Specifically, INVEST helped SCAG recognize the need to consider infrastructure resiliency in the agency’s future planning agenda. Plenty of institutional, resource, and data challenges lie ahead as SCAG looks ahead to the development of the 2016 RTP/SCS, but with the direction provided by INVEST, the SCAG region will be able to not only continue, but to build on its past efforts in planning for a more sustainable Southern California.
ADA | Americans with Disabilities Act of 1990
Guarantees equal opportunity for individuals with disabilities in public accommodations, employment, transportation, state and local government services, and telecommunications. It prescribes federal transportation requirements for transportation providers.

ARB | Air Resources Board (California)
California state agency responsible for attaining and maintaining healthy air quality through setting and enforcing emissions standards, conducting research, monitoring air quality, providing education and outreach, and overseeing/assisting local air quality districts.

ATSAC | Automated Traffic Surveillance and Control
Centralized traffic control center for the City of Los Angeles.

AVL | Automated vehicle location
A means for automatically determining and transmitting the geographic location of a vehicle.

BRT | Bus rapid transit
Bus transit service that seeks to reduce travel time through measures such as traffic signal priority, automatic vehicle location, dedicated bus lanes, limited-stop service, and faster fare collection policies.

Caltrans | California Department of Transportation
California state agency responsible for the design, construction, maintenance, and operation of the California State Highway System, as well as that portion of the Interstate Highway System within the state’s boundaries.

CEQA | California Environmental Quality Act
California state law providing certain environmental protections that apply to all transportation projects funded with state funds.
CMIA | Corridor Mobility Improvement Account
These funds would be allocated by the California Transportation Commission to highly congested travel corridors in the state. Projects in this category must be a high priority; be able to start construction by 2012; improve mobility in a highly congested corridor by improving travel times and reducing vehicle hours of delay; connect the State Highway System; and improve access to jobs, housing, markets, and commerce.

CSMP | Corridor System Management Plans
A comprehensive, integrated management plan for increasing transportation options, decreasing congestion, and improving travel times in transportation corridor.

EPA | Environmental Protection Agency
Federal agency established to develop and enforce regulations that implement environmental laws enacted by Congress to protect human health and safeguard the natural environment.

FHWA | Federal Highway Administration
Federal agency responsible for administering the Federal-Aid Highway Program, which provides federal financial assistance to the states to construct and improve the National Highway System, urban and rural roads, and bridges.

FTA | Federal Transit Administration
The federal agency responsible for administering federal transit funds and assisting in the planning and establishment of area wide urban mass transportation systems. As opposed to FHWA funding, most FTA funds are allocated directly to local agencies, rather than to Caltrans.

GHG | Greenhouse gases
Components of the atmosphere that contribute to the greenhouse effect. The principal greenhouse gases that enter the atmosphere because of human activities are carbon dioxide, methane, nitrous oxide, and fluorinated gases.

HST | High-speed train
Intercity passenger rail service that is reasonably expected to reach speeds of at least 110 miles per hour.

INVEST | Infrastructure Voluntary Evaluation Sustainability Tool
A web-based self-evaluation tool developed by FHWA that transportation agencies can use to gauge their level of sustainability and systematically integrate sustainable practices into their actions.

ITS | Intelligent Transportation Systems
Systems that use modern detection, communications and computing technology to collect data on system operations and performance, communicate that information to system managers and users, and use that information to manage and adjust the transportation system to respond to changing operating conditions, congestion, or accidents. ITS technology can be applied to arterials, freeways, transit, trucks, and private vehicles. ITS include Advanced Traveler Information Systems (ATIS), Advanced Public Transit Systems (APTS), Advanced Traffic Management Systems (ATMS), Advanced Vehicle Control Systems (AVCS), and Commercial Vehicle Operations (CVO).

LOSSAN | Los Angeles-San Diego-San Luis Obispo (Rail Corridor)
The 351-mile Los Angeles – San Diego – San Luis Obispo Rail Corridor, which travels through a six-county coastal region in Southern California and is the second busiest intercity passenger rail corridor in the United States.

MAP-21 | The Moving Ahead for Progress in the 21st Century Act
The first long-term highway authorization enacted since 2005, signed into law by President Obama on July 6, 2012, funding surface transportation programs at over $105 billion for fiscal years (FY) 2013 and 2014.

NEPA | National Environmental Protection Act
Federal environmental law that applies to all projects funded with federal funds or requiring review by a federal agency.
**O&M | Operations and maintenance**  
The range of activities and services provided by the transportation system and for the upkeep and preservation of the existing system.

**PEIR | Program Environmental Impact Report**  
Environmental review process used to evaluate the potential environmental effects of large-scale plans or programs.

**RSTIS | Regionally Significant Transportation Investment Study**  
Involves identifying all reasonable transportation options, their costs, and their environmental impacts. RSTIS projects are generally highway or transit improvements that have a significant impact on the capacity, traffic flow, level of service, or mode share at the transportation corridor or sub-area level.

**RTP | Regional Transportation Plan**  
Federally required 20-year plan prepared by metropolitan planning organizations and updated every four years. Includes projections of population growth and travel demand, along with a specific list of proposed projects to be funded.

**SB 375 | Senate Bill 375 (California)**  
Established to implement the State of California’s greenhouse gas (GHG) emission-reduction goals, as set forth by AB 32, in the sector of cars and light trucks. This mandate requires the California Air Resources Board to determine per capita GHG emission-reduction targets for each metropolitan planning organization (MPO) in the state at two points in the future—2020 and 2035. In turn, each MPO must prepare a Sustainable Communities Strategy (SCS) that demonstrates how the region will meet its GHG reduction target through integrated land use, housing, and transportation planning.

**SCAG | Southern California Association of Governments**  
The metropolitan planning organization (MPO) for six counties including Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura.

**SCS | Sustainable Communities Strategy**  
A newly required element of the Regional Transportation Plan per California Senate Bill 375. The SCS must integrate land use and transportation strategies to achieve greenhouse gas emissions reduction targets set by the California Air Resources Board.

**TAZ | Transportation analysis zone**  
Zone system used in travel demand forecasting.

**TDM | Transportation Demand Management**  
Strategies that result in more efficient use of transportation resources, such as ridesharing, telecommuting, park-and-ride programs, pedestrian improvements, and alternative work schedules.

**TMC | Transportation Management Center**  
The hub or nerve center of most freeway management systems.

**TSM | Transportation Systems Management**  
A set of strategies that aims to reduce greenhouse gas emissions by reducing congestion, primarily by improving transportation system capacity and efficiency.

**TSM&O | Transportation Systems Management and Operations**  
An integrated program to optimize the performance of existing multimodal infrastructure through implementation of systems, services, and projects to preserve capacity and improve the security, safety, and reliability of the transportation system.

**VMT | Vehicle miles traveled**  
A measurement of the total miles traveled by all vehicles in the area for a specified time period. It is calculated by the number of vehicles times the miles traveled in a given area or on a given highway during the time period. In transit, the number of vehicle miles operated on a given route or line or network during a specified time period.
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