5 Performance Measures
This page left blank intentionally.
**Introduction**

The investments identified in the 2040 MTP/SCS are expected to result in significant benefits to the region, not only with respect to transportation and mobility, but also economic activity, air quality, safety, and social equity. This chapter describes the benefits and outcomes projected to result from the implementation of the 2040 MTP/SCS with respect to the adopted regional performance measures. This chapter also describes how the 2040 MTP/SCS addresses the statutory requirements regarding SB 375 and social equity.

**Performance Outcomes**

This section summarizes how well the 2040 MTP/SCS performs. Table 5-1 lists the outcomes of performance measures forecasted using both the AMBAG Regional Travel Demand Model (RTDM) and Geographic Information Systems (GIS). While this chapter includes summaries of the performance improvements expected from the implementation of the 2040 MTP/SCS, more detail is provided in Appendix G.

In the discussion of performance and outcomes, three scenarios are referenced: Existing, No Build, and Plan. The 2015 Existing represents existing conditions and includes only existing transit service and the existing transportation network in 2015. The 2040 No Build assumes current land use trends and represents a future in which only committed programs and projects are implemented. Committed programs and projects are those which are programmed in the 2016 Metropolitan Transportation Improvement Program (MTIP) that have received environmental clearance. The Plan refers to future conditions in which the 2040 MTP/SCS land use patterns and transportation investments are realized. The specific projects associated with the Plan are identified in Appendix C.

**Access and Mobility**

Accessibility is used to capture how well the transportation system performs in providing people access to various destinations. Destinations can include anything from jobs, education, medical care, recreation, shopping, or another activity that is essential to one’s daily needs or helps to improve quality of life. In the 2040 MTP/SCS, accessibility performance measures consider the distribution of trips by mode and travel time.

**Work Trips Within 30 Minutes**

Compared to existing, the percentage of transit work trips that can be made in 30 minutes improves in the 2040 MTP/SCS. Drive alone and carpool work trips maintain a high level of performance with more than 84 percent of the trips capable of being made within 30 minutes.
### Table 5-1: Performance Measures

<table>
<thead>
<tr>
<th>Regional Performance Measures</th>
<th>2015 Existing</th>
<th>2040 No Build</th>
<th>2040 MTP/SCS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Access and Mobility</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work Trips Within 30 Minutes (percentage)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drive Alone</td>
<td>84.3%</td>
<td>83.9%</td>
<td>84.5%</td>
</tr>
<tr>
<td>Carpool</td>
<td>84.3%</td>
<td>83.9%</td>
<td>84.5%</td>
</tr>
<tr>
<td>Transit</td>
<td>13.0%</td>
<td>13.0%</td>
<td>15.8%</td>
</tr>
<tr>
<td>Commute Travel Time (minutes)</td>
<td>15.6</td>
<td>15.7</td>
<td>15.5</td>
</tr>
<tr>
<td><strong>Economic Viability</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jobs Near High Quality Transit (percentage)</td>
<td>21.4%</td>
<td>20.6%</td>
<td>29.6%</td>
</tr>
<tr>
<td>Daily Truck Delay (hours)</td>
<td>2,799</td>
<td>7,778</td>
<td>7,432</td>
</tr>
<tr>
<td><strong>Environment</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GHG Reductions (Percent reduction from 2005 baseline)</td>
<td>N/A</td>
<td>N/A</td>
<td>-6.6%</td>
</tr>
<tr>
<td>Open Space Consumed (acres)</td>
<td>N/A</td>
<td>0</td>
<td>11</td>
</tr>
<tr>
<td>Farmland Converted (acres)</td>
<td>N/A</td>
<td>1,805</td>
<td>294</td>
</tr>
<tr>
<td><strong>Healthy Communities</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alternative Transportation Trips (percentage)</td>
<td>17.3%</td>
<td>18.1%</td>
<td>17.7%</td>
</tr>
<tr>
<td>Smog Forming Pollutants (TOG) (lbs/day) per capita</td>
<td>0.019</td>
<td>0.005</td>
<td>0.005</td>
</tr>
<tr>
<td>Peak Period Congested Vehicle Miles of Travel (miles)</td>
<td>499,064</td>
<td>1,259,191</td>
<td>1,118,524</td>
</tr>
<tr>
<td><strong>Social Equity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distribution of MTP/SCS Investments (percentage)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low income areas</td>
<td>N/A</td>
<td>N/A</td>
<td>95.8%</td>
</tr>
<tr>
<td>Non low income areas</td>
<td>N/A</td>
<td>N/A</td>
<td>4.2%</td>
</tr>
<tr>
<td>Minority areas</td>
<td>N/A</td>
<td>N/A</td>
<td>96.5%</td>
</tr>
<tr>
<td>Non minority areas</td>
<td>N/A</td>
<td>N/A</td>
<td>3.5%</td>
</tr>
<tr>
<td>Access to Transit within 1/2 mile (percentage)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low income population</td>
<td>27.9%</td>
<td>27.9%</td>
<td>28.1%</td>
</tr>
<tr>
<td>Non low income population</td>
<td>11.2%</td>
<td>11.2%</td>
<td>11.2%</td>
</tr>
<tr>
<td>Minority population</td>
<td>32.1%</td>
<td>32.1%</td>
<td>32.3%</td>
</tr>
<tr>
<td>Non minority population</td>
<td>5.2%</td>
<td>5.2%</td>
<td>5.0%</td>
</tr>
<tr>
<td><strong>System Preservation and Safety</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maintain the Transportation System (percentage)</td>
<td>N/A</td>
<td>N/A</td>
<td>66.7%</td>
</tr>
<tr>
<td>Fatalities and Injuries per 1,000 VMT</td>
<td>0.09</td>
<td>0.07</td>
<td>0.07</td>
</tr>
<tr>
<td>Annual Projected Bike/Pedestrian Fatalities and Injuries per 1,000 VMT</td>
<td>0.02</td>
<td>0.02</td>
<td>0.02</td>
</tr>
</tbody>
</table>

1. Greenhouse gas reductions in 2020 are -4.3 percent from 2005 levels.
2. Rail projects are not reflected in the 2020, 2035 and 2040 MTP/SCS regionally significant project analysis, as rail lines are existing.
3. 2040 No Build scenario has increased open space due to farmland conversion per the 2040 MTP/SCS typology as identified by the city and county jurisdictions in SOI's.
4. Farmland analyzed is Prime, Unique, or Farmland of Statewide Importance as defined by Dept. of Conservation FMMP.
5. Calculated based upon criteria on total investment of all modelable projects within 1/2 mile of U.S. Census Bureau defined tracts.
6. Tracts defined per U.S. Census Bureau. Calculated based on criteria on total acreage and percentage of population within a 1/2 mile of transit.

Source: AMBAG Regional Travel Demand Model and Geographic Information Systems. For more information on methodology see Appendix G.
**Performance Measures**

**Commute Travel Time**
Compared to Existing and No Build, average commute travel time will remain nearly the same with the improvements included in the 2040 MTP/SCS despite an additional 120,000 people living in the region.

**Economic Vitality**
In order to measure the economic vitality of the region, performance measures related to proximity of jobs from transit as well as truck traffic were examined. By providing better access to jobs the region’s economy can continue to grow. Additionally a measure looking at truck traffic was considered imperative given the importance of goods movement to the regional economy.

**Jobs Near High Quality Transit**
In 2040, 30 percent of the region’s jobs are within one-half mile of a high quality transit stop, compared to only 21 percent in the base year.

**Daily Truck Delay**
This measure estimates the daily truck hours of delay. The 2040 MTP/SCS includes investments in a regional freight corridor and other improvements to facilitate goods movement. The Plan is estimated to reduce truck delay by more than four percent over No Build. However, the truck delay under the Plan will still be above existing levels.

**Environment**
There are many aspects of the 2040 MTP/SCS that are geared towards improving the environment. However, the performance measures categorized as environmental here are those that have a major effect on the physical surroundings.

**Greenhouse Gas Reductions**
The targets agreed upon by AMBAG and the California Air Resources Board (CARB) for greenhouse gas reductions are a zero percent per capita increase from 2005 levels by 2020 and a five percent per capita reduction from 2005 levels by 2035. The Plan exceeds the target in both years achieving more than four percent reduction in 2020 and a nearly seven percent reduction in 2035.

**Open Space Conservation**
This performance measure shows the total acreage of open space consumed by development. In that regard it considers impacts to sensitive habitat only as it pertains to destruction of that habitat for development. The performance measures do not include a separate analysis for sensitive habitat, however a detailed discussion of the impacts to sensitive habitat can be found in the Environmental Impact Report. The Plan assumes the amount of open space that would be consumed due to land use development and transportation investments is 73 acres.

**Farmland Preservation**
This performance measure shows the total acreage of farmland consumed by development. The 2040 MTP/SCS shows that 2,099 acres of farmland would be consumed. All of the farmland being consumed in the Plan is within existing spheres of influence or is within Community Plan Areas as designated by the General Plans in the region.

**Healthy Communities**
More and more government organizations are adopting a health in all policies approach to policy and planning. The transportation system and land use patterns in this region have the potential to substantially impact the health and wellbeing of its residents. Specifically, alternative transportation trips have the potential to: increase a person’s daily...
physical activity therefore having a lasting positive effect on health; improve air quality which directly effects people’s lungs and physical wellbeing; and reduce congestion which can decrease the amount of exposure to poor air and noise pollution.

**Alternative Transportation Trips**
This performance measure evaluates the percent of trips made using transit, shared ride, bicycle or pedestrian modes. The Plan shows a slight increase in the total percent of trips taken using an alternative mode. However, it is difficult to capture the full benefits of active transportation investments in current travel demand models as available data on these types of modes is more limited than data on vehicle trips. The benefit of investing in alternative transportation modes is likely far greater than models are able to capture.

**Air Pollution**
The air quality performance measure evaluates smog forming total organic gases in daily short tons. The Plan improves the air quality throughout the region over the 2015 existing measures of smog forming pollutants.

**Congested Vehicle Miles of Travel**
The congested vehicle miles traveled in the region is improved in the Plan over the No Build scenario, however it still increases over 2015 existing levels. As population increases so will congested VMT increase. The Plan does improve the projected congested VMT over a scenario in which the region does nothing to address transportation needs.

**Social Equity**
In this document social equity refers to the equitable distribution of transportation impacts (benefits, disadvantages and costs) regardless of income status or race and ethnicity. Social equity performance measures compare low income and minority populations against non-low income and minority populations to ensure that there is an equitable distribution of benefits and not a disproportionate share of burdens. The low income and minority areas are shown in Figure 5-1. For more information on identification of these
• Low Income Populations: any Census tract in which 65 percent or more of families are low income, and/or 20 percent or more of the families are living at or below the poverty income threshold.

• Minority Populations: any Census tract in which 65 percent or more of the population is non-White.

Distribution of Transportation Investments
The 2040 MTP/SCS includes regional investments in the transportation system across the three counties. The distribution of transportation investments are greater in low income and minority areas compared to other areas.

The analysis for low income populations shows that the 2040 MTP/SCS will result in higher increases in transportation investments for low income populations: 96 percent in low income areas compared to four percent in non-low income areas.

The analysis also shows that the 2040 MTP/SCS will result in higher investments for minority populations as compared to non-minority populations.

Equitable Transit Access
This performance measure evaluates the percent of low income and minority populations that are located within one-half mile of a transit stop. With the 2040 MTP/SCS, access to transit would increase to 28.1 percent for low income and 32.3 percent for minority populations. Figure 5-2 highlights transit accessibility of the region.

Vehicle Miles Traveled
The number of vehicle miles traveled (VMT) is an indicator of the travel levels on the roadway system by motor vehicles. VMT is estimated for a given time period. This estimate is based upon traffic volume counts and roadway length and is used to give planners an understanding of the level of usage of the roadway network. VMT is also used to estimate greenhouse gas emissions. However, when examining VMT to understand potential GHGs one must take into account various speeds at which cars travel. A vehicle traveling at slow or very high speeds on a highway emits more greenhouse gas emissions than one traveling at 45 to 55 miles per hour. For this reason planners often look to congested VMT rather than total VMT to gain a better understanding of impact on emissions.

As the region’s population continues to grow, VMT will also continue to grow. However, the growth in population is not the only factor fueling the rise in travel. Other factors include economic growth, relatively affordable auto travel costs, tourism, low levels of public transit, and other related factors. As the amount of auto travel increases, the time wasted on congested roadways, the energy used by vehicles and total costs of auto travel increase accordingly. The 2040 MTP/SCS aims to reduce this congested VMT, by providing a host of transportation options such that people do not have to drive everywhere but have alternative options available to them, particularly for shorter distance trips.
System Preservation and Safety

One of the ongoing struggles with the region’s transportation system is finding the funding needed for preventative maintenance. The cost to maintain the existing transportation system is accelerating as the cost to fix roadways increases exponentially the longer it is deferred. The cost for roadway rehabilitation is six to ten times more expensive than ongoing preventative maintenance. Maintenance is required for the system not only for quality of life for existing users, but also for the safety of those users.

Maintain the Transportation System

The 2040 MTP/SCS dedicates two-thirds of the total funding available for maintenance and rehabilitation projects.

Fatalities and Injuries

This performance measure evaluates the safety of the transportation system by using data on injuries and fatalities to calculate a per capita rate of injury or fatality. Fatalities and injuries are relatively unchanged between 2015 and 2040 staying at a rate of 0.7 in 1,000 of injury or fatality per capita. This is a particularly difficult measure to project because it assumes that fatalities and injuries are held constant for every vehicle mile traveled. However, by establishing it as a performance measure in the 2040 MTP/SCS this opens the door for AMBAG to monitor past injuries and fatalities and therefore monitor the effects of the Plan as it is implemented over the course of time.

Environmental Justice and Title VI

The Monterey Bay Area is a diverse area with both low and high cost areas. However, in California even “low cost” areas are expensive compared to national averages. According to the H+T index developed by Center for Neighborhood Technology over half of the households in this region spend more than 45 percent of their income on transportation and housing costs combined. If just housing costs are considered without transportation costs, then half of the residents in this region spend over 30 percent of their income on housing costs. The high cost of housing as well as daily goods and services means that many households which are above the federal poverty standards will still struggle to live in this region. In addition, the Plan looks at the effect of these investments on the minority population, which increasingly is the majority of the people living in the region.

Environmental Justice

Background

The concept of environmental justice is about equal and fair access to a healthy environment, with the goal of protecting underrepresented and low income communities from incurring disproportionate negative environmental impacts. Consideration of environmental justice in the transportation planning process stems from Title VI of the Civil Rights Act of 1964 (Title VI). Title VI establishes the need for transportation agencies to disclose to the public the benefits and burdens of proposed projects on minority populations. The understanding of civil rights has expanded to include low income communities, as further described below. Title VI states that “No person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance.” Additionally, Title VI not only bars intentional discrimination, but also unjustified disparate impact discrimination. Disparate impacts result from policies and practices that are neutral on their face (i.e., there is no evidence of intentional discrimination), but have the effect of discrimination on protected groups.

A 1994 Presidential Order (Executive Order 12898) directed every federal agency to make Environmental Justice part of its mission by identifying and addressing the effects of all programs, policies and activities on underrepresented groups and low income populations. Reinforcing Title VI, this Presidential Order ensures that every federally funded project nationwide considers the human environment when undertaking the planning and decision
Figure 5-1: Low Income Minority Areas
making process. The Presidential memorandum accompanying E.O. 12898 identified Title VI as one of several federal laws that should be applied “to prevent minority communities and low income communities from being subject to disproportionately high and adverse environmental effects.” Given the overlap in Title VI and environmental justice policies, the term “environmental justice” is used as an inclusive term to mean minority and low income populations. In addition to federal requirements, AMBAG must comply with California Government Code Section 11135, which states that “no person in the State of California shall, on the basis of race, national origin, ethnic group identification, religion, age, sex, sexual orientation, color, or disability, be unlawfully denied full and equal access to the benefits of, or be unlawfully subjected to discrimination under, any program or activity that is conducted, operated, or administered by the state or by any state agency, is funded directly by the state, or receives any financial assistance from the state.”

AMBAG’s Title VI/Environmental Justice Policy and Program

As a government agency that receives federal funding, AMBAG is required to conduct an environmental justice analysis for its MTP. AMBAG’s environmental justice program includes two main elements: technical analysis and public outreach. Specifically, it is AMBAG’s role to ensure that when transportation decisions are made, low income and minority communities have ample opportunity to participate in the decision making process and that they receive an equitable distribution of benefits and not a disproportionate share of burdens. AMBAG adheres to all directives on Environmental Justice.

Under federal policy, all federal agencies must make environmental justice part of their mission and adhere to three fundamental Title VI/environmental justice principles:

- To avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low income populations.
- To ensure the full and fair participation by all potentially affected communities in the transportation decision making process.
- To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low income populations.

AMBAG complies with the framework provided to integrate the principles of environmental justice into the decision making processes.

Technical Analysis

As with the other performance measures presented in this chapter, the comparison of the Plan versus Existing and the No Build is the primary focus of the environmental justice analysis for the 2040 MTP/SCS. The Plan represents the selected strategy to guide the region’s transportation planning over the next two decades, while the No Build represents “business as usual” and assumes current land use trends and the completion of projects programmed in the 2016 MTIP that have received environmental clearance. The data for the analysis is based on the AMBAG RTDM and GIS analysis results. Based on the analysis conducted, the Plan increases transportation investment in low income and minority populations as well as improves access to transit and therefore destination opportunities. Additional information on the performance measures is included in Appendix G.

AMBAG’s Title VI and Environmental Justice Outreach

A key component of the 2040 MTP/SCS development process is seeking public participation. Public input from partner agencies and key stakeholders helped AMBAG prioritize and address needs in the region. As part of the outreach effort, AMBAG compiled a list of key stakeholders to be contacted regarding 2040 MTP/SCS programs and policies. This list is comprised of a large variety of individuals and organizations ranging from community groups, interest groups, environmental groups, etc. AMBAG maintains this list regularly and
Figure 5-2: Transit Access

2040 Transit Access
December 2017 - Source: AMBAG

- Transit Routes (1/2 mile buffer)
- Low Income and/or Minority Areas
- Transit Accessible
- Rail Line
allows interested persons to sign up online for the mailing list. The outreach conducted for the SCS to low income and minority groups resulted in the inclusion of increased transit funding in currently underserved areas, the prioritization of vanpooling as a transportation demand management strategy and the emphasis on economic development within the SCS itself.

**Performance Monitoring**

The federal government’s MAP-21, the Moving Ahead for Progress in the 21st Century Act, established a performance- and outcome-based transportation program. The objective of this program is for states and regions to invest resources in projects that collectively will make progress toward the achievement of the national goals. The national goals include safety, infrastructure condition or state of good repair, congestion reduction, transportation system reliability, freight movement and economic vitality, environmental sustainability, and reduced project delivery delays.

MAP-21 and the current Fixing America’s Surface Transportation (FAST) Act require the U.S. Department of Transportation (DOT), in consultation with states, metropolitan planning organizations (MPOs), and other stakeholders, to establish performance measures in the following areas:

- Pavement condition on the Interstate Highway System and on remainder of the National Highway System (NHS)
- Performance of the Interstate Highway System and the remainder of the NHS
- Bridge condition on the NHS
- Fatalities and serious injuries – both number and rate per vehicle mile traveled – on all public roads
- Traffic congestion
- On-road mobile source emissions
- Freight movement on the Interstate Highway System

The U.S. DOT has issued Notices of Proposed Rulemaking or Final Rules for most of the performance areas. Staff developed comments on the proposed rule for National Performance Management Measures; Assessing Performance of the National Highway System, Freight Movement on the Interstate System, and Congestion Mitigation and Air Quality Improvement Program (PM3). AMBAG, as the MPO for the Monterey Bay Area region, is required to establish performance targets within six months of the statewide targets. The Safety Performance Measure (PM1) final rule became effective on April 14, 2016. AMBAG is participating in this target setting process with Caltrans and other partner agencies. Caltrans established state safety targets in August 2017, and AMBAG will either support the state targets or set its own by February 2018. AMBAG also has created a new work element in its Overall Work Program for Transportation Performance Management.