

Chapter 5

Performance

At both the scenario and project levels, Plan Bay Area has been tested against rigorous performance targets. Because of this, MTC and ABAG have been able to craft a plan that emphasizes the most effective strategies to achieve regional objectives. Even so, some targets remain stubbornly out of reach.

Plan Bay Area achieves the greenhouse gas emissions reduction

target required by state law through a more efficient land use pattern, key transportation investments, and initiatives such as accelerated electric vehicle deployment. It also achieves the housing target required by state law to provide housing for all of the region's population over the next three decades, relying on local communities' support for policies that direct the lion's share of housing growth into Priority Development Areas.

At the same time, Plan Bay Area struggles to achieve many of the region's ambitious voluntary targets. Thanks to investments in transportation alternatives, the plan moves in the right direction when it comes to increasing active transportation and reducing the number of automobile miles driven per capita, though it falls short of the "aspirational" goals set in these areas. While the draft plan allocates funds and introduces policies to address them, roadway safety, transportation and housing for low-income persons, and the transportation system's state of good repair remain vexing problems that the region must redouble our efforts to confront.



511 changeable message sign, Interstate 80

Peter Beeler

How Does Plan Bay Area Perform?

As has been the case in past long-term transportation plans, no single strategy is able to achieve all the plan's performance targets, and the draft Plan Bay Area clearly bears this out. Some targets — including the key greenhouse gas emissions and housing targets — are met or even exceeded. In other cases, the plan makes progress toward achieving a target, but falls short of full attainment. And in other cases, the plan actually loses ground against some metrics.

Here is a target-by-target breakdown of how well the draft Plan Bay Area performs. (See Chapter 1 for background on the performance targets. Additional analysis of target performance can be found in the *Performance Assessment Report*, listed in Appendix 1.) Given the plan's 2040 horizon year, target results reflect year 2040 performance in comparison to year 2005 base-line conditions, unless noted.

Required Performance Targets

Climate Protection

Target #1: Reduce per-capita CO₂ emissions from cars and light-duty trucks by 15 percent.



Plan meets and exceeds target; reduces per-capita emissions of CO₂ by 18 percent (by 2040).

Reducing the transportation sector's emission of greenhouse gases responds to the threat of climate change and helps to address the threat to the region from sea level rise.

Through combinations of denser land use patterns focused in Priority Development Areas, increased investments in the region's public transit infrastructure, and enhanced funding of climate initiatives such as electric vehicle adoption incentives, Plan Bay Area not only meets but exceeds its greenhouse gas (GHG) emissions reduction target. By 2040, the typical Bay Area resident is expected to reduce his or her daily transportation CO₂ emissions by 18 percent compared to 2005 conditions.



MTC Archives

Senate Bill 375 mandates per-capita GHG target achievements for years 2020 and 2035 as established by the California Air Resources Board. For 2035, the draft plan leads to a 16 percent per-capita reduction (surpassing the 15 percent target), and for 2020, the draft plan leads to a 10 percent per-capita reduction (also surpassing an interim 7 percent target).

While MTC has considered the effects of transportation investments on GHG emissions in prior regional transportation plans, Plan Bay Area is the first regional effort with an aggressive and achievable emission reduction goal. By accelerating efforts to emphasize infill growth and to boost funding for public transit, this draft plan represents a bold step for the region in this era of climate change.

Adequate Housing

Target #2: House 100 percent of the region's projected population growth by income level (very-low, low, moderate, above-moderate) without displacing current low-income residents.



Plan meets target; houses 100 percent of population growth.

It's no secret that the Bay Area is one of the most expensive places to live in the United States. For decades this has caused an ever-increasing number of people who work in the Bay Area to look for more affordable housing in the Central Valley or other surrounding regions. The resulting longer-distance commutes increase emissions while also raising transportation costs for the residents who must venture so far afield in search of more affordable housing. This places a greater burden on lower-income residents and further increases the divide between the region's more-affluent and less-affluent residents. The region's businesses also suffer, since the dispersal of workers tends to constrain the supply of labor they can draw on.

SB 375 requires regions to plan for housing that can accommodate all projected population growth, by income level, so as to reduce the pressures that lead to in-commuting from outside the nine-county region. In November 2010, ABAG adopted a methodology to define this figure. This target is also intended to limit the displacement of low-income residents, defined as the outward movement of current low-income residents from locations in the region's urban core to locations with lower accessibility to transportation options and limited services as a result of new development pressures. This target complements the Regional Housing Need Allocation (RHNA), as discussed in Chapter 3.

Plan Bay Area succeeds in identifying housing opportunities for all of the region's population. Working with cities and counties to underscore the importance of achieving this target, MTC and ABAG are putting forward a plan that provides sufficient housing for the number of new jobs created in the region. The focus on spurring housing in locally supported Priority Development Areas and high-quality transit corridors allows the plan to meet this target, and also helps to achieve the GHG emissions reduction target (see above).

Voluntary Performance Targets

Healthy and Safe Communities

Reduce Particulate Matter

Target #3: Reduce premature deaths from exposure to particulate emissions:

Target #3a: Reduce premature deaths from exposure to fine particulates (PM_{2.5}) by 10 percent.



Plan meets and exceeds target; reduces premature deaths from exposure to fine particulates by 71 percent.

Target #3b: Reduce coarse particulate emissions (PM₁₀) by 30 percent.



Plan reduces coarse particulate emissions by 17 percent, but falls short of target.

Target #3c: Achieve greater reductions in highly impacted areas.



Plan meets target; achieves greater particulate emission reductions in highly impacted neighborhoods.

Particulate matter (PM) consists of very small particles that can pass through the throat and nose and into the lungs and may even enter the bloodstream. Over time this can affect the heart and lungs and lead to serious health effects such as heart attacks or asthma, and can even contribute to premature death. While particulate matter is directly linked to vehicle miles traveled, the approach taken with this target moves from simply measuring vehicle use to measuring healthy outcomes for the region's residents.

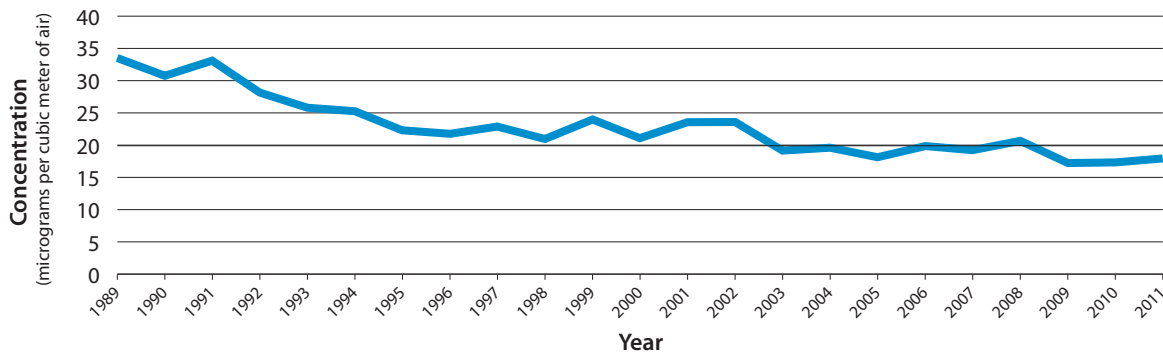
The Bay Area does not meet the federal standard for fine particulate matter (PM_{2.5}), which is extremely hazardous to health. The goal of a 10 percent reduction in premature deaths due to PM_{2.5} reflects the expected benefit from meeting the federal standard, assuming each emission sector (both mobile and non-mobile sources) takes on similar emission reduction shares. The region, like all major metropolitan regions in the state, also does not yet attain the state standard for the coarser PM₁₀, which also causes health impacts. The 30 percent reduction goal for PM₁₀ is consistent with the reduction needed to meet the state standard.

There has been substantial progress in reducing Bay Area PM levels in recent years¹. The state and the Bay Area Air Quality Management District have taken major steps to address pollution impacts of this Bay Area traffic — primarily, to clean up truck engines and fuel, the primary sources of particulate emissions. New regional and state regulations are expected to reduce

¹ Air quality monitoring data shows that the Bay Area met the national 24-hour PM_{2.5} standard during the 2008–2012 period. However, the Bay Area is still formally designated a non-attainment area for the national 24-hour PM_{2.5} standard.

premature deaths by 71 percent by 2040, saving 159 lives per year compared to the 2005 baseline. This projection far exceeds the 10 percent reduction target for Plan Bay Area. Coarse particulates, known as PM₁₀, also represent a major threat to air quality and public health; in 2005, Bay Area vehicles emitted 15 tons (approximately the weight of seven passenger vehicles) of particulate matter every day. While the historical trend has been favorable (see Figure 1), and aforementioned regulations help move us in the right direction with regard to this ambitious target (reducing emissions by 17 percent by 2040), they still fall short of achieving the 30 percent target established for Plan Bay Area.

Figure 1 Bay Area Annual Mean PM₁₀ (Quarterly Averaged, 9-site Mean, 1989–2011)



Source: Bay Area Air Quality Management District

PM₁₀ Concentration

Despite more stringent controls on tailpipe emissions and fuels, meeting the PM₁₀ target will be difficult given the region's long-term mobility needs. To achieve the public health benefits of this target, it will be necessary to reduce auto trip distances and to promote the use of alternative modes of transportation such as transit, biking and walking. While Plan Bay Area offers more individuals new public transit options and supports the trend towards shorter-distance commutes, regional growth will lead to more vehicles (and more vehicle miles) than ever before.

Reduce Injuries and Fatalities From Collisions

Target #4: Reduce by 50 percent the number of injuries and fatalities from all collisions (including bike and pedestrian).

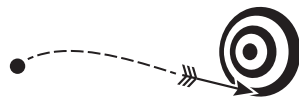


Making the Bay Area safer for motorists, pedestrians and bicyclists is an important and ongoing priority. This target reflects an emphasis in Plan Bay Area to enhance safety for all travel modes across the Bay Area. The target is adapted from the state's Strategic Highway Safety Plan (2006), and also reflects a long-standing regional goal of making streets, highways and transit service safer.

Approximately 39,000 individuals were injured or killed in collisions on Bay Area roads during the year 2005, highlighting the critical need to improve roadway safety. Unfortunately, as a result of the region's growth in total population and in total vehicle miles traveled, we lose ground against this target over the course of the draft plan. Although as a region we continue to invest in safer roads for all modes of transport, over 46,000 individuals are forecasted to be injured or killed in collisions in year 2040, an 18 percent increase in roadway tragedies compared to 2005. While it is some comfort to know that the per-capita rate of collisions is projected to decline by 10 percent during the plan period, the sheer number of people traveling on the network — combined with the certainty of occasional human error — overwhelms the safety improvements for which the draft plan allocates funding.

Encourage Active Transport

Target #5: Increase the average daily time walking or biking per person for transportation by 70 percent (for an average of 15 minutes per person per day).



Plan boosts per-person active transportation by 17 percent, but falls short of target.



John J. Kim

The U.S. Surgeon General recommends at least 30 minutes of physical activity per day to lower the risk of chronic disease and increase life expectancy. While Bay Area residents are more physically active than residents in most other parts of the country, the current measure of Bay Area residents' average daily physical activity still falls well short of the Surgeon General's recommendation. The average time Bay Area residents spent walking and biking for transportation was about 9 minutes per person in 2005. There is no accepted standard for the amount of activity people should get through day-to-day transportation compared to other activities. However, in order to increase the health of our communities, Plan Bay Area set out to bring the average up to 15 minutes per person per day by encouraging people to spend more time walking or biking.

In order to improve public health in the light of rising obesity rates, it is essential to construct and improve facilities to allow for walking and bicycling during one's daily routine. The draft plan invests in complete streets, local streetscape improvements, and new bike and pedestrian paths, with an objective of providing new opportunities for Bay Area residents to walk and bike to daily destinations.

Unfortunately, while these investments do boost the amount of time individuals spent walking and biking, the region continues to fall short of this public health target. The typical Bay Area resident spent about 9 minutes per day walking or biking for transportation purposes in the year 2005, while Plan Bay Area will increase the average amount to 10 minutes per day in year 2040 (a 17 percent increase).

While many people who make the effort to exercise regularly do so by going to the gym or playing on a sports team, transportation related exercise could play a crucial role in boosting regional health. Unless additional efforts are initiated to encourage walking and biking for daily commutes or daily errands, exercise from walking and biking is expected to only increase slightly as a result of Plan Bay Area.

Open Space and Agricultural Land

Target #6: Direct all non-agricultural development within the year 2010 urban footprint (existing urban development and urban growth boundaries).



Plan meets target; directs all non-agricultural development within the existing urban footprint.

SB 375 requires consideration of open space and natural resource protection and supports accommodating new housing and commercial development within existing areas designated for urban growth. This is of particular importance to the Bay Area, where so much of the region's spectacular natural setting has been preserved as open space. And whether it is the scenic wine country or the small farms that supply thriving farmers markets with local produce, agricultural lands also merit special protection.

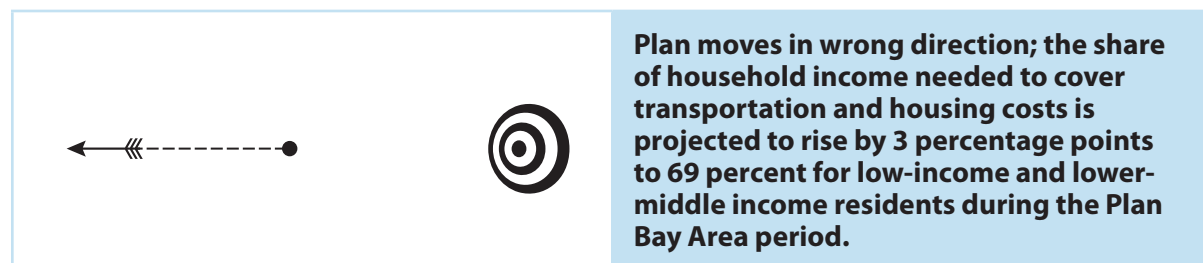


The intent of this target, therefore, is to support infill development in established communities while protecting the Bay Area's agriculture and open space lands.

To ensure that the Bay Area retains the landscapes that its residents value so highly, the Plan Bay Area aims to protect open space and agricultural land by directing 100 percent of the region's growth inside the year 2010 urban footprint, which means that all growth occurs as infill development or within established urban growth boundaries or urban limit lines. As the draft plan assumes that all urban growth boundaries/urban limit lines are held fixed through the year 2040, no sprawl-style development is expected to occur on the region's scenic or agricultural lands. This will help preserve the natural beauty of the Bay Area for future generations to enjoy.

Equitable Access

Target #7: Decrease by 10 percentage points (to 56 percent, from 66 percent) the share of low-income and lower-middle income residents' household income consumed by transportation and housing.



Not only have housing costs increased over the years, but gasoline costs have crept (and sometimes leapt) up as well. Higher gas prices disproportionately burden low-income residents who drive, and in the Bay Area most low-income residents own and drive cars. In 2005, low-income and working class families in the Bay Area spent 66 percent of household income on housing and transportation, which is about 10 percentage points higher than similar families in other major U.S. metropolitan areas, and a significant cost burden.

This target addresses this situation by setting a goal of reducing the share of household income that poorer residents must devote to housing and transportation. It aims to bring the Bay Area in line with the national average, and help ensure that low-income residents are able to continue to live and work in the region.

However, expected rises in gasoline prices, combined with forecasts of a regional housing market recovery, are expected to disproportionately affect those at the lower end of the income spectrum — a challenge that will face not only the Bay Area, but the nation as a whole. For this group, transportation and housing costs are likely to rise faster than household incomes during the Plan Bay Area period. On the plus side, Plan Bay Area policies should help to stabilize the length and duration of commute trips for lower-income residents — which provides benefits in terms of overall quality of life.

Economic Vitality

Target #8: Increase gross regional product (GRP) by 110 percent — an average annual growth rate of approximately 2 percent (in current dollars).



Past long-range transportation plans have not included an analysis of economic impacts, even though they have directed the spending of billions of dollars of transportation funds. Of course, past transportation investments — such as transit expansion projects and freeway improvements — have certainly provided significant benefits to the Bay Area economy, but those benefits were not quantitatively estimated during plan development. Plan Bay Area takes the first step to directly address this issue through a quantitative performance target.



Peter Beeler

Gross regional product (GRP) reflects overall economic output of the region's residents and businesses. While the Bay Area economy is affected by global and national trends, regional land use patterns and transportation system efficiency also affect freight mobility and general productivity.

Between 2005 and 2040, taking Plan Bay Area into account, the region's gross regional product is forecasted to increase by 119 percent, slightly exceeding the region's historical growth rate of approximately 2 percent per year. Forecasted job growth and population growth play a primary role in the expected rise in GRP; as more households and employers decide to locate in the Bay Area, regional economic activity tends to grow by a proportionate amount.

In addition, plan investments in congestion relief projects improve workers' mobility across the region, benefitting the economy as a whole. The planned land use pattern, which emphasizes growth in high-density job centers, boosts regional economic productivity and supports overall economic growth. By boosting the efficiency of the region's land use pattern and transportation network, Plan Bay Area works to enhance the region's economic competitiveness on both national and international levels. For more information, see the *Economic Impact Analysis for Future Regional Plans*, listed in Appendix 1.

Transportation System Effectiveness

Increase Non-Auto Mode Share and Reduce VMT per Capita

Target #9a: Increase non-auto mode share by 10 percentage points (to 26 percent of trips).



Target #9b: Decrease automobile vehicle miles traveled (VMT) per capita by 10 percent.



In order to reduce emissions and improve public health, Plan Bay Area sets goals to increase non-auto mode share and reduce VMT per capita. These targets are a reflection of how effective the transportation system is in providing easier, faster access to individuals' travel destinations. Plan Bay Area strives to achieve these targets by making alternatives to the private automobile more convenient, more frequent, and more appealing. Supportive land use patterns also play a role; if destinations are closer to home, non-auto modes become more competitive and all trip lengths become shorter.



SamTrans

While Plan Bay Area increases the proportion of Bay Area travelers who walk, bike or utilize public transit, and decreases the daily miles traveled by the average Bay Area resident, it falls slightly short on both measures. Sixteen percent of Bay Area trips did not require an automobile in the year 2005; the region's target envisioned growing that share by 10 percentage points (to 26 percent) by the year 2040. Plan Bay Area's achievement of a 20 percent non-auto mode share means that one in five Bay Area trips would be expected to be car-free by year 2040,

thanks to investments in transit, bike and pedestrian infrastructure that makes these modes more attractive.

This shift, when combined with reduced average distances between home, work and retail locations, also leads to a reduction in per-capita VMT. The average Bay Area resident traveled about 22 miles by car on a typical weekday in 2005; by 2040, the average resident is expected to travel only 20 miles per day, a reduction of 9 percent. This near-achievement of the per-capita VMT target reflects the carefully targeted locations of envisioned housing and commercial development in Priority Development Areas with excellent transit service.



Peter Beeler

Maintain the Transportation System in a State of Good Repair:

Local Road and Highway Maintenance

MTC has a long-standing commitment to a "fix-it-first" policy in the realm of transportation. This means that, as a region, we should strive to maintain our streets, highways and transit system before investing in system expansions. However, the Bay Area's extensive network of roads and highways is extremely expensive to maintain. Some of our cities and counties



Karl Nielsen

receive poor pavement ratings year after year, and the average PCI score for local pavement is currently 66, which is only "fair" in qualitative terms. The state highway system in the region faces similar challenges. Furthermore, our extensive transit system is rapidly aging and reaching the point where many of our assets are due for replacement at once. Failure to maintain the existing system at all levels would result in increased future maintenance costs, unreliable service and increased costs to travelers.

Target #10a: Increase local road pavement condition index (PCI) to 75 or better.



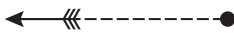
Plan improves pavement condition of local roads to a PCI of 68, but falls short of target.

While the region has made progress on local road conditions over the past decade (increasing its pavement condition index from 63 in 2005 to 66 today), Bay Area road conditions remain in the “Fair” category. Thus, the targeted improvement to a “Good” PCI of 75 was clearly an ambitious objective.

Even though approximately one-third of Plan Bay Area funding is directed toward maintaining and operating our existing road network, average PCI is only expected to increase to 68 by year 2040. This represents an 8 percent improvement in local road conditions over year 2005. Given the costs of maintaining the region’s aging infrastructure, this is still a notable achievement, especially considered relative to the degradation of state highway and transit assets over the plan’s lifespan (see below).

This target’s performance is aided by voter-approved local sales tax measures, which have boosted the funding available for preserving and maintaining local streets and roads. Yet even this funding is not adequate to enable most local roads to reach a “Good” PCI of 75. Without increased funding from a regional gas tax or a shift to vehicle miles traveled tax, it will continue to be a challenge to achieve this ambitious target.

Target #10b: Decrease distressed lane-miles of state highways to less than 10 percent of total lane-miles.



Plan moves in opposite direction from target; the percentage of distressed state highway lane-miles in the region will rise to 44 percent of the regional highway system by year 2040

Given the state’s ongoing budget constraints, the state highway system continues to suffer from deferred maintenance and worsening roadway conditions. As the highway system is owned and maintained by Caltrans, the system’s safety and upkeep lies with them. If current budget constraints continue over the coming decades, the share of distressed lane-miles is expected to increase from 27 percent of the overall Bay Area highway network to 44 percent of the network.

Plan Bay Area does not allocate any discretionary funding toward the maintenance of the state highway system, given that the state is responsible for its preservation. Additional statewide funding for roadway maintenance would be the most direct approach to address this target’s degradation over the lifespan of the draft plan.

Transit Maintenance

Target #10c: Reduce the share of transit assets past their useful life to 0 percent.



Plan moves in opposite direction from target; the share of transit assets past their useful life is projected to increase to 24 percent of all assets during the Plan Bay Area period.














Peter Beeler





Bay Area transit riders depend on well-maintained vehicles, stations and trackways in order to ensure system reliability and performance. While all transit agencies would prefer to retire transit vehicles at the end of their prescribed life, the high cost of such vehicles delays their replacement, leading to more vehicle breakdowns and systemwide delays. In 2012, approximately 13 percent of all Bay Area transit assets were past their useful life; by 2040, 24 percent of transit assets are expected to be past their useful life, even though the plan allocates over half the region's funding to operate and maintain the existing transit system.

Given that almost one in four transit assets is expected to exceed its useful life in year 2040, passenger comfort is expected to degrade, along with customer satisfaction in the system's reliability, safety and speed. Of course, transit assets do not need to be in an ideal state of repair for transit service to be provided successfully. However, as the state of repair declines, the negative effects on equipment availability and reliability will eventually reach the point of impairing service levels, and would likely impede transit agencies' efforts to boost ridership. That said, it should also be noted that transit asset management is a relatively new and evolving field, and there have been no established guidelines for a minimum required state of repair, or for how to evaluate whether the state of repair is sufficient to sustain transit services. New transit asset management requirements contained in the recently enacted federal law known as MAP-21 will help focus attention on this long-term issue, but in the long run, greater financial support from the federal or state levels will be needed to bring the Bay Area transit network into an ideal state of good repair.

Summary of Performance

Table 1 Results of Plan Bay Area Target Assessment

Plan Meets or Exceeds Target			
Climate Protection	Target #1: Reduce per-capita CO ₂ emissions from cars and light-duty trucks by 15 percent.	Plan meets and exceeds target; reduces per-capita emissions of CO ₂ by 18 percent (by 2040).	
Adequate Housing	Target #2: House 100 percent of the region's projected growth by income level (very-low, low, moderate, above-moderate) without displacing current low-income residents.	Plan meets target; houses 100 percent of population growth	
Healthy and Safe Communities Reduce Particulate Matter	Target #3a: Reduce premature deaths from exposure to fine particulates (PM _{2.5}) by 10 percent.	Plan meets and exceeds target; reduces premature deaths from exposure to fine particulates by 71 percent.	
	Target #3c: Achieve greater reductions in highly impacted areas.	Plan meets target; achieves greater particulate emission reductions in highly impacted neighborhoods.	
Open Space and Agricultural Land	Target #6: Direct all non-agricultural development within the year 2010 urban footprint (existing urban development and urban growth boundaries)	Plan meets target; directs all non-agricultural development within the existing urban footprint.	
Economic Vitality	Target #8: Increase gross regional product (GRP) by 110 percent — an average annual growth rate of approximately 2 percent (in current dollars).	Plan meets and exceeds the economic growth target; 119 percent increase in GRP is forecasted over the life of the plan.	
Plan Makes Progress Toward Target			
Healthy and Safe Communities Reduce Particulate Matter	Target #3b: Reduce coarse particulate emissions (PM ₁₀) by 30 percent.	Plan reduces coarse particulate emissions by 17 percent, but falls short of target.	
Active Transport	Target #5: Increase the average daily time walking or biking per person for transportation by 70 percent (for an average of 15 minutes per person per day).	Plan boosts per-person active transportation by 17 percent, but falls short of target.	
Transportation System Effectiveness Increase Non-Auto Mode Share	Target #9a: Increase non-auto mode share by 10 percentage points (to 26 percent of trips).	Plan boosts non-auto mode share to 20 percent of trips, but falls short of target.	
Reduce VMT per Capita	Target #9b: Decrease automobile vehicle miles traveled (VMT) per capita by 10 percent.	Plan reduces VMT per capita by 9 percent, but falls short of target.	
Local Road Maintenance	Target #10a: Increase local road pavement condition index (PCI) to 75 or better	Plan improves pavement condition of local roads to a PCI of 68, but falls short of target.	

Plan Moves in Opposite Direction From Target			
Reduce Injuries and Fatalities from Collisions	Target #4: Reduce by 50 percent the number of injuries and fatalities from all collisions (including bike and pedestrian).	Plan moves in opposite direction from target; injury and fatality collisions are projected to increase during plan period by 18 percent.	
Equitable Access	Target #7: Decrease by 10 percentage points (to 56 percent from 66 percent) the share of low-income and lower-middle income residents' household income consumed by transportation and housing.	Plan moves in wrong direction; the share of household income needed to cover transportation and housing costs is projected to rise to 69 percent for low-income and lower-middle income residents during the Plan Bay Area period.	
Transportation System Effectiveness Highway Maintenance	Target #10b: Decrease distressed lane-miles of state highways to less than 10 percent of total lane-miles.	Plan moves in opposite direction from target; the percentage of distressed state highway lane-miles in the region will rise to 44 percent of the regional highway system by year 2040	
Transit Maintenance	Target #10c: Reduce the share of transit assets past their useful life to 0 percent.	Plan moves in opposite direction from target; the share of transit assets past their useful life is projected to increase to 24 percent of all assets during the Plan Bay Area period.	

Key Targets Achieved in Solid Overall Effort, But Breakthrough Strategies Needed for Some Targets

As has been the case in past long-term transportation plans, no single strategy is able to achieve all the plan's performance targets. A review of the performance results for the 10 main targets and five sub-targets (for a total of 15 performance measures) clearly bears this out. Specifically, the draft plan meets or exceeds six targets, including the statutory greenhouse gas emissions and housing targets, narrowly misses three targets, falls well short of two targets and moves in the wrong direction on four of the targets. In other words, the draft plan makes great progress on nine of 15 performance measures, which represents a solid first effort. MTC and ABAG will need to focus future attention on conceptualizing breakthrough strategies to achieve the four targets where we are falling behind.

Key Equity Analysis Findings

With respect to the separately conducted analysis of the plan's social equity impacts (See Chapter 1 for background on the Equity Analysis), most of the measures studied do not show improvements for either "communities of concern" or the rest of region relative to conditions in 2010. However, Plan Bay Area does perform better than the year 2040 baseline forecast across most measures. This is notable in the case of the Housing and Transportation Affordability measure.

One of the most notable findings in the Equity Analysis is in the Potential for Displacement measure, where the focused concentration of growth in Plan Bay Area overlaps with a larger share of today's rent-burdened households than in the baseline forecast. This measure reflects Plan Bay Area's support for investment and development in communities of concern, while also

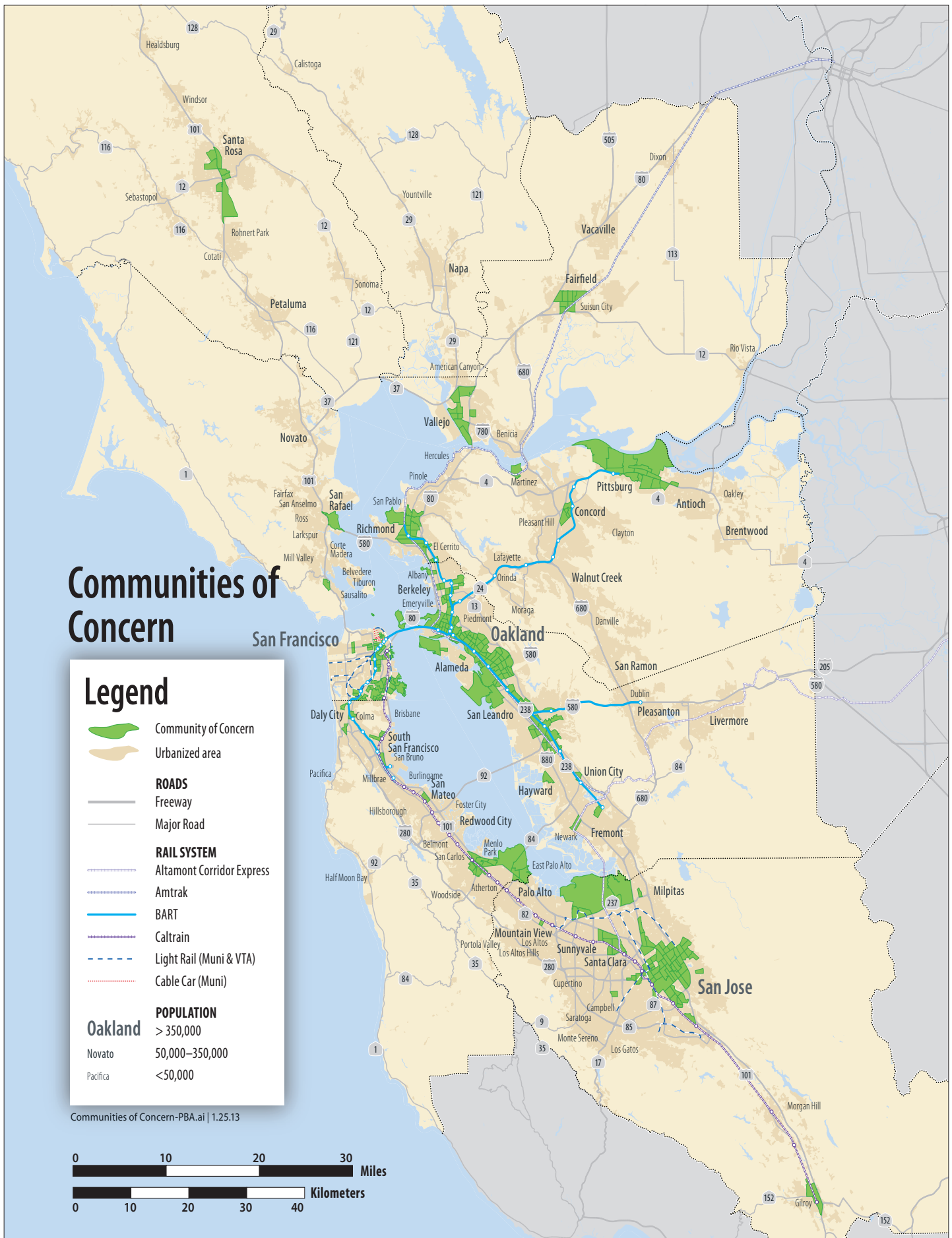
flagging the potential risk of market-based displacement due to rising rents as these neighborhoods improve. The plan responds with increased emphasis on funding to support the provision of affordable housing, requires the adoption of local housing elements to receive key funds, and sets forth a requirement for PDA Investment and Growth Strategies that will examine key housing policy issues.

Table 2 Results of Plan Bay Area Equity Analysis, 2010–2040

Equity Performance Measure	Target Population	2010	2040 (Baseline Forecast)	2040 (Draft Plan Bay Area)
1 Housing and Transportation Affordability % of income spent on housing and transportation by low-income households	Low-Income Households	72%	80%	74%
	All Other Households	41%	44%	43%
2 Potential for Displacement % of rent-burdened households in high-growth areas	Communities of Concern	n/a	21%	36%
	Remainder of Region	n/a	5%	8%
3 Healthy Communities Average daily vehicle miles traveled per populated square mile within 1,000 feet of heavily used roadways	Communities of Concern	9,737	11,447	11,693
	Remainder of Region	9,861	11,717	11,895
4 Access to Jobs Average travel time in minutes for commute trips	Communities of Concern	25	26	26
	Remainder of Region	27	29	27
5 Equitable Mobility Average travel time in minutes for non-work-based trips	Communities of Concern	12	13	13
	Remainder of Region	13	13	13

Several other findings of significance emerged from the Equity Analysis.

- Alongside displacement pressures, housing and transportation affordability are forecast to continue to be key challenges for low-income households in the future.
- While air quality will improve in the region overall with improved technologies, increased vehicle traffic and congestion in communities of concern raise safety concerns for those areas where walking and biking are more common modes of travel.
- Travel times to jobs and other destinations will increase slightly for communities of concern compared to today, due to higher levels of congestion in the urban core and some trips shifting from driving to transit, walking, and biking.



The key findings of the Equity Analysis are displayed in Table 2. More information and detailed results, including all other alternatives studied, are included in the *Plan Bay Area Equity Analysis Report* listed in Appendix 1.

Communities of Concern

The definition of “communities of concern” for Plan Bay Area is intended to represent a diverse cross-section of populations and communities that could be considered disadvantaged or vulnerable in terms of both current conditions and potential impacts of future growth. (See the map on facing page, which shows the locations of these communities of concern.) For purposes of the Equity Analysis, communities of concern are defined as those neighborhoods with notably high concentrations of four or more of the following: minority persons; low-income individuals; persons who are Limited English Proficient; seniors age 75 and over; persons with disabilities; households without cars; single-parent households; and renters paying more than 50 percent of household income on rent. 4. Under this definition, about one-fifth of today’s total regional population lives in areas defined as communities of concern. The Equity Analysis attempts to determine how the plan’s proposed investments distribute benefits and burdens to these communities relative to the remainder of the region.

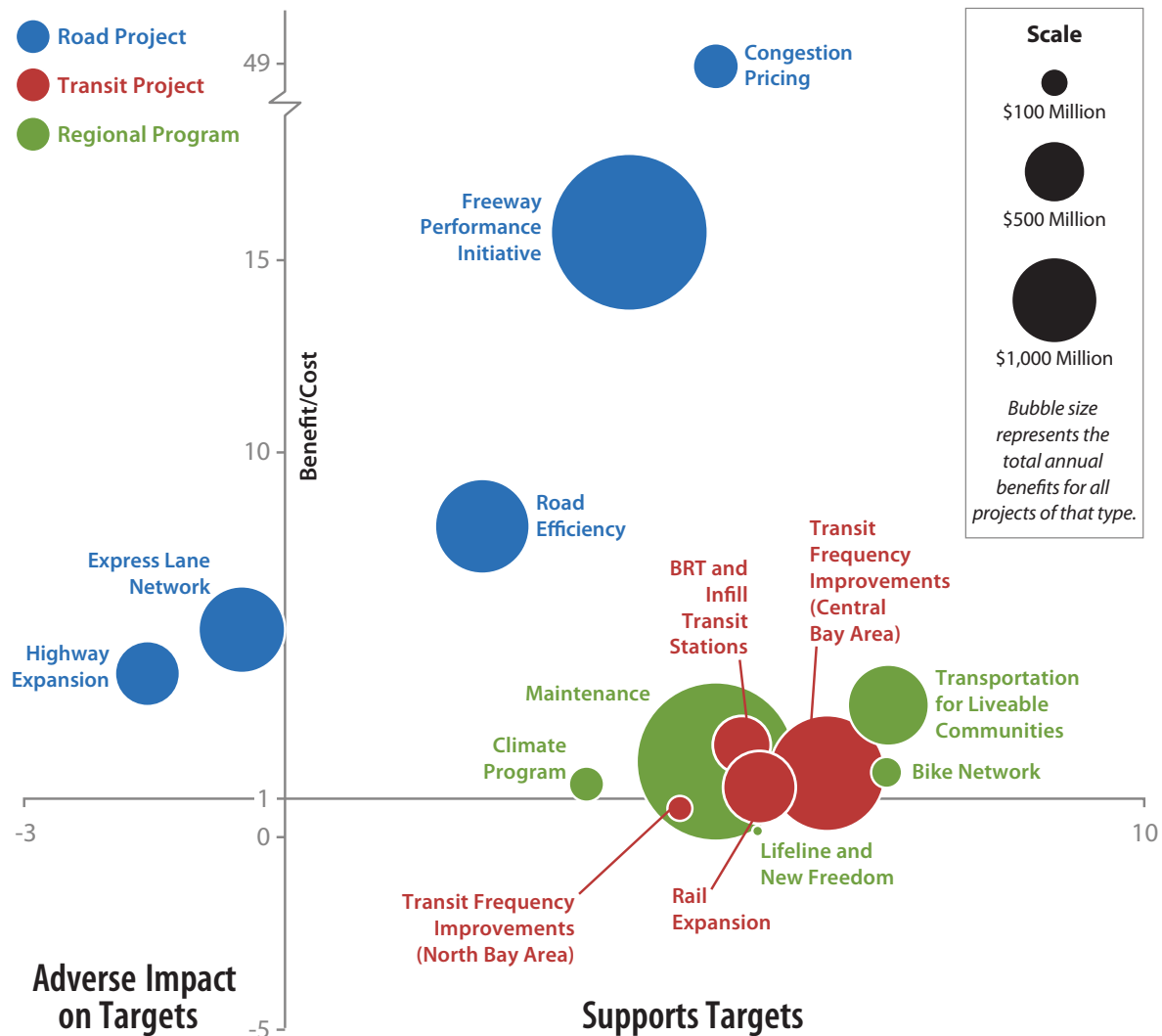
Project-Level Performance Assessment of Transportation Projects

Much effort in long-range planning is spent on big-picture questions: should the region focus on expanding the transportation system, or on maintaining what we have already built? Should the region invest more in transit for future generations, or emphasize highway projects to improve the lives of today’s drivers? While planners can address these questions at the scenario level, Plan Bay Area is also based on MTC’s commitment to evaluate individual projects to make sure dollars are being allocated to the most cost-effective projects that support a more sustainable future or the region.

In order to take a closer look at major transportation projects, MTC performed a project performance assessment, examining billions of dollars of potential transportation projects to identify the highest-performing investments across the region. Each major project was evaluated based on two criteria: benefit-cost ratio (which captures the project’s cost-effectiveness); and a “target” score (which measures the contribution the project makes toward achieving Plan Bay Area’s 10 adopted performance targets). Figure 2 displays the results of this analysis by transportation project type. Since all projects were analyzed across the region consistently using the regional travel demand model, high-performing projects were able to be prioritized for regional funding opportunities. For more information about the specific scoring criteria, please refer to the *Performance Assessment Report*, listed in Appendix 1.

As shown in Table 3, most of the high-performing projects in the region are focused on leveraging existing assets and improving their efficiency. Notable projects include BART Metro, which will increase service frequencies on the highest-demand segment of the BART system, and San Francisco’s congestion pricing initiatives, under which vehicles entering downtown (or Treasure Island) will be charged a toll, with the proceeds being used to pay for more frequent transit services.

Figure 2 Project-Level Performance Assessment: Results by Transportation Project Type



To further ensure that Plan Bay Area advances the most cost-effective and beneficial projects, MTC required a second level of project review. Any project with a benefit-cost ratio less than 1 or an “adverse” score on the targets assessment had to submit a compelling case to policy-makers for inclusion in the plan. Over 30 projects were identified as low-performers as a result of this process, and the vast majority of these are not included in this draft plan. The handful of low-performing projects that remain in the draft plan tend to demonstrate their positive impact on social equity and low-income neighborhoods — an issue not fully captured in the benefit-cost ratio or targets score.

Not only did the project performance assessment help identify regional funding priorities and remove ineffective projects, but it has informed the tradeoffs among competing priorities.

When combined with input from transportation partners and stakeholders on the vast majority of projects that were neither high- nor low-performing, the project-level assessment has significantly influenced this draft plan.

Table 3 Highest-Performing Transportation Projects, Ranked by Benefit/Cost (B/C) Ratio and Target Score

	Project Name	County	B/C Ratio	Overall Targets Score	Project Capital Costs (Million \$)	Project Description
1	BART Metro Program (including Bay Fair Connection & Civic Center Turnback)	Multi-County	>60	8.5	650	Increases the efficiency of BART in the urban core by constructing new turnbacks and providing new express train service.
2	Treasure Island Congestion Pricing	San Francisco	59	4.0	59	Charges a \$5 toll for residents to enter/exit Treasure Island during peak hours; net revenues designated for transit service.
3	Congestion Pricing Pilot	San Francisco	45	6.0	102	Charges a \$3 toll to enter/exit the northeast quadrant of San Francisco during peak hours; net revenues designated for transit service.
4	AC Transit Grand-MacArthur Bus Rapid Transit (BRT)	Alameda	18	5.5	36	Constructs a bus rapid transit line along the Grand Avenue and MacArthur Avenue corridors in Oakland, providing faster service for AC Transit Line NR.
5	Freeway Performance Initiative	Regional	16	4.0	2,991	Maximizes the efficiency of the roadway network through arterial signal coordination and freeway ramp metering.
6	Intelligent Transportation System (ITS) Improvements in San Mateo County	San Mateo	16	4.0	66	Maximizes the efficiency of the roadway network through arterial signal coordination and freeway ramp metering.
7	ITS Improvements in Santa Clara County	Santa Clara	16	4.0	320	Maximizes the efficiency of the roadway network through arterial signal coordination and freeway ramp metering.
8	Irvington BART Station	Alameda	12	5.5	123	Constructs a new infill BART station in the Irvington district of Fremont.
9	SFMTA Transit Effectiveness Project	San Francisco	11	7.5	157	Improves reliability and reduces travel times on key Muni bus corridors through signal prioritization and bus lanes.
10	Caltrain Service Frequency Improvements (6-Train Service during Peak Hours) + Electrification (SF to Tamien)	Multi-County	5	7.5	848	Electrifies the Caltrain line and purchases additional train vehicles to provide faster, more frequent service during peak hours.
11	BART to San Jose/ Santa Clara (Phase 2: Berryessa to Santa Clara)	Santa Clara	5	7.0	4,094	Extends BART from the Phase 1 terminus in Berryessa (North San Jose) through a new BART subway to Alum Rock, Downtown San Jose, Diridon Station, and Santa Clara.
12	Van Ness Avenue BRT	San Francisco	6	6.5	140	Constructs a bus rapid transit line with dedicated lanes along the Van Ness corridor in San Francisco (from Lombard to Mission).
13	Better Market Street	San Francisco	6	6.0	200	Increases transit speeds along San Francisco's Market Street between the Embarcadero & Octavia by restricting auto traffic on the corridor.

Plan Bay Area Draft Environmental Impact Report

Under the California Environmental Air Quality Act (CEQA), ABAG and MTC must conduct an Environmental Impact Report (EIR) to inform decision makers, responsible and trustee agencies, and the general public of the range of potential environmental impacts that could result from the implementation of Plan Bay Area. The EIR analyzes a range of alternatives to Plan Bay Area adopted by ABAG and MTC in July 2012 that achieve the main objectives of the plan while testing different options to do so.

In addition to the draft Plan Bay Area (the “Project” or “Preferred Alternative” in EIR terminology), the other alternatives that were analyzed in the EIR include:

- A **No Project** alternative which includes the continuation of existing policies with some expansion of urban growth boundaries and only transportation projects that were fully funded and had environmental clearance prior to beginning the Plan Bay Area process. This alternative is required by CEQA.
- A **Transit Priority Focus** alternative which seeks to maximize the benefits of environmental streamlining permitted under SB 375 in high-quality transit areas. As such, these high quality transit areas were upzoned, irrespective of local support for growth. To complement this, a development fee would be instituted in high VMT (vehicle miles traveled) areas and the proceeds would be used to underwrite growth in lower VMT areas. This alternative includes higher Bay Bridge tolls, increased funding for transit, and decreased funding for the Regional Express Lane Network.
- An **Enhanced Network of Communities** alternative was developed in coordination with a coalition of Bay Area business representatives. It envisions a land use development pattern less intense than the draft Plan Bay Area but also less dispersed than the No Project alternative. It too includes subsidies to achieve the desired growth pattern, as well as an increased Bay Bridge toll. Its transportation investments are almost identical to those in the draft Plan Bay Area. This alternative also assumes higher population, housing and employment totals.
- An **Environment, Equity, and Jobs** alternative was developed with various equity and environmental stakeholders. It emphasizes increasing opportunities for low-income housing development in jobs-rich communities through zoning changes and even larger subsidies than the other alternatives. All roadway expansion projects included in the draft Plan Bay Area were eliminated. Additional funding, such as an increased Bay Bridge toll and a VMT tax for miles driven (exempting low-income households), was assumed. The new revenue would fund additional transit service.

The complete EIR providing detailed information on the alternatives as well as the environmental impacts of the draft Plan Bay Area can be found in the *Draft Environmental Impact Report*, listed in Appendix 1.

Target Assessment of the EIR Alternatives

In addition to the legally required assessment of the EIR alternatives, MTC and ABAG also analyzed the EIR transportation and land use alternatives for their performance against the adopted Plan Bay Area targets and equity metrics in order to inform the final phase of the decision-making process for Plan Bay Area. The targets analysis of these scenarios provides a final assessment of the draft Plan Bay Area. The target results can be found in Table 4. As can be seen, the EIR alternatives perform relatively similarly across almost all the targets, even though the results may be reached by different paths – with a few notable exceptions. For example, due to its more dispersed land use pattern, the No Project alternative lags the other alternatives when it comes to reducing GHGs (Target 1) or protecting open space (Target 6). The Network of Communities scenario, due to higher jobs and housing totals, does not achieve the particulate target (Target 3c), while it does improve state highway conditions (Target 10b) by shifting funds to maintain these roads.

The Equity, Environment and Jobs (EEJ) scenario does best on a number of targets related to reducing auto use (Targets 3b, 4, 5 and 9a) by implementing a VMT tax and eliminating road projects, while shifting funds to transit operations and local road repair (Target 10a). Overall, the Preferred land use pattern and transportation investment strategy embodied in the draft Plan Bay Area holds up well in this assessment, with the greatest decrease in GHGs per capita (Target 1) and similar or equal results for many of the remaining targets.



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The small differences across the alternatives for many of the targets should be interpreted carefully. The target estimates are derived from analytical tools that attempt to represent very complex patterns of travel and land development behavior. Further, these representations of behavior rely on a host of assumptions about the prevailing economic, political and technological conditions expected in 2040. When these factors are combined, the resulting un-

certainty prevents identifying clear-cut differences across the range of alternatives presented here. However, these tools do provide a consistent framework in which expected (and rational) responses to policies can be assessed and the careful interpretation of results can lead to the insights noted above.

Table 4 Target Analysis: Plan Bay Area EIR Alternatives for Year 2040

Target	Goal	No Project	Preferred	Transit Priority Focus	Network of Communities	Equity, Environment & Jobs
1 Reduce per-capita CO ₂ emissions from cars and light-duty trucks	-15%	-8%	-18%	-16%	-16%	-17%
2 House the region's projected growth	100%	100%	100%	100%	118%	100%
3a Reduce premature deaths from exposure to fine particulates (PM _{2.5})	-10%	-71%	-71%	-72%	-69%	-72%
3b Reduce coarse particulate emissions (PM ₁₀)	-30%	-16%	-17%	-17%	-14%	-18%
3c Achieve greater particulate emission reductions in highly impacted areas	Yes	Yes	Yes	Yes	No	Yes
4 Reduce the number of injuries and fatalities from all collisions	-50%	+18%	+18%	+17%	+23%	+16%
5 Increase the average daily time walking or biking per person for transportation	+70%	+12%	+17%	+18%	+13%	+20%
6 Direct all non-agricultural development within the year 2010 urban footprint	100%	53%	100%	100%	100%	100%
7 Decrease the share of low-income and lower-middle income residents' household income consumed by transportation and housing	-10%	+8%	+3%	+5%	+3%	+2%
8 Increase gross regional product (GRP)	+110%	+118%	+119%	+118%	+123%	+118%
9a Increase non-auto mode share	26%	19%	20%	20%	19%	21%
9b Decrease automobile vehicle miles traveled (VMT) per capita	-10%	-5%	-9%	-8%	-9%	-9%
10a Increase local road pavement condition index (PCI)	75	50	68	68	68	71
10b Decrease share of distressed lane-miles of state highways	10%	44%	44%	44%	30%	41%
10c Reduce share of transit assets exceeding useful life	0%	36%	24%	24%	24%	24%

	achieves or exceeds performance target
	falls short of performance target
	moving in the wrong direction

Equity Analysis of the EIR Alternatives

Alongside the final target assessment is the equity analysis of this final set of scenarios. As has been the case throughout the equity analysis process, most of the results for the scenarios are quite similar, especially for vehicle miles traveled (VMT) density and travel time. All of the scenarios struggle to address chronic high housing and transportation costs, though the Equity, Environment and Jobs (EEJ) scenario shows slight improvement in housing costs thanks to increased affordable housing production, while the draft Plan Bay Area offers lower transporta-

Table 5 Results of Plan Bay Area Equity Analysis for EIR Alternatives, 2010-2040

1 Housing and Transportation Affordability			2010 Base Year	1 No Project	2 Project	3 Transit Priority	4 Network of Communities	5 Equity, Environment and Jobs
% of household income spent on housing and transportation costs								
Households <\$38,000/year	H+T %	72%	80%	74%	77%	74%	73%	
Households >\$38,000/year	H+T %	41%	44%	43%	43%	42%	43%	
2 Potential for Displacement			2010 Base Year	1 No Project	2 Project	3 Transit Priority	4 Network of Communities	5 Equity, Environment and Jobs
Share of today's overburdened-renter households located in high-growth areas								
Communities of Concern	n/a	21%	36%	25%	31%	21%		
Remainder of Region	n/a	5%	8%	7%	9%	6%		
Regional Average	n/a	12%	18%	13%	17%	12%		
3 VMT Density			2010 Base Year	1 No Project	2 Project	3 Transit Priority	4 Network of Communities	5 Equity, Environment and Jobs
Average vehicle-miles of travel per per square kilometer of residential and commercial land within 1000 feet of major roadways.								
Communities of Concern	9,737	11,447	11,693	11,536	12,123	11,259		
Remainder of Region	9,861	11,717	11,895	11,804	12,261	11,626		
Regional Average	9,836	11,664	11,855	11,751	12,234	11,554		
4 Commute Time			2010 Base Year	1 No Project	2 Project	3 Transit Priority	4 Network of Communities	5 Equity, Environment and Jobs
Average time in minutes for commute trips								
Communities of Concern	25	26	26	25	26	25		
Remainder of Region	27	29	27	26	27	27		
Regional Average	26	28	27	26	27	27		
5 Non-commute Travel Time			2010 Base Year	1 No Project	2 Project	3 Transit Priority	4 Network of Communities	5 Equity, Environment and Jobs
Average time in minutes for trips not involving the workplace, including shopping, visiting, recreation, etc.								
Communities of Concern	12	13	13	13	13	13		
Remainder of Region	13	13	13	13	13	13		
Regional Average	13	13	13	13	13	13		

tion costs by locating more housing and jobs near the region's most robust transit service (see Table 5). In addition, increased vehicle traffic in communities of concern across the scenarios raises safety concerns for those areas where walking and biking are more common modes of travel.

The target showing the biggest variance from the Project Alternative is the Potential for Displacement measure; this is due to the concentrated growth patterns in the draft plan as the region strives to meet its GHG reduction target. More of today's rent-burdened households in the Communities of Concern could be at risk for displacement than under the baseline forecast scenario, while both the No Project trend and EEJ scenario distribute growth more widely. This result, consistent with past rounds of analysis, led MTC and ABAG to bolster the plan's investment in the Transit Oriented Affordable Housing fund, add requirements for housing element adoption and affordable housing production considerations to the One Bay Area Grant program, and build into the region's Prosperity Plan (outlined in Chapter 6) a study of displacement risk and tools to offset it. In addition, this displacement risk could be mitigated in cities such as San Francisco with rent control and other tenant protections in place.

More information and detailed results are included in the *Plan Bay Area Equity Analysis Report*, in Appendix 1.





