

Integrating MTC's Regional Planning Initiatives with the Federal Congestion Management Process: A Strategic Approach for the San Francisco Bay Area

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**METROPOLITAN
TRANSPORTATION
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Chapter 1 – Overview

Bay Area freeway congestion impacts residents and disrupts businesses, leading to longer commutes, increased stress, and pollution, which reduce overall quality of life and economic vitality.

The Metropolitan Transportation Commission (MTC) is actively tackling these transportation challenges. By optimizing freeway systems, MTC intends to decrease travel delays, ensuring smoother commutes and bolstering business efficiency. Additionally, MTC advocates for alternatives to solo driving to minimize peak-hour traffic, improving commute reliability and reducing traffic-related stress. MTC also supports the development of transit-friendly, walkable communities to decrease car dependence, cultivating vibrant neighborhoods.

Through these efforts, MTC aims to enhance residents' daily experiences and bolster local businesses, underscoring its dedication to a better Bay Area.

What is MTC?

Established by the California Legislature in 1970, MTC oversees the transportation planning, financing, and coordination for the nine-county San Francisco Bay Area. The federal government later designated MTC as the region's Metropolitan Planning Organization, entrusting it with the strategic distribution of federal transportation funds. Responsibilities include developing the regional transportation plan (“Plan Bay Area”), leading the Congestion Management Process (CMP), and executing the federal Transportation Performance Management (TPM) program.

State legislation has since expanded MTC's mandate. Today, MTC administers toll bridge revenues, integrates environmental considerations into transportation planning, and tackles housing challenges. Despite these added responsibilities, MTC consistently performance-based planning and proactive congestion management.

What is the Congestion Management Process?

The Federal Highway Administration requires Metropolitan Planning Organizations, serving populations over 200,000, to adopt a performance-driven, outcome-based approach to congestion management. This approach entails collaboratively developing and implementing strategies to reduce travel demand and improve job access in metropolitan areas. These planning and operational management strategies directly influence the planning and programming processes of each MPO.

As the designated Metropolitan Planning Organization for the San Francisco Bay Area, MTC is tasked with fulfilling these requirements.

Planning Requirements

As stipulated in 23 CFR §450.322, the CMP is a comprehensive approach that includes several critical components. These components, further described below, involve an evaluation of the existing transportation system, setting of goals and objectives, development of a data collection strategy, identification and assessment of strategies, planning for implementation, and performance monitoring. This structure ensures a thorough and effective process for managing congestion.

- **Existing System Assessment** - Methods to monitor and evaluate performance of the multimodal transportation system, including identifying and evaluating alternative strategies.
- **Goals, Objectives, and Performance Measures** - Definition of CMP objective and performance measures to assess the extent of congestion and effectiveness of congestion reduction and mobility enhancement strategies.
- **Data Collection Strategy** - Methods to collect data and monitor system performance, leveraging existing data sources.
- **Strategy Identification and Assessment** - Identification and evaluation of the anticipated performance and expected benefits of congestion management strategies, such as 1) demand management measures, including growth management and congestion pricing; 2) traffic operational improvements; 3) public transportation improvements; 4) ITS technologies; and 5) where necessary, additional system capacity.
- **Implementation Planning** - Identification of an implementation schedule, responsibilities, and funding sources for each proposed strategy
- **Performance Monitoring** - Process for periodic assessment of the effectiveness of implemented strategies using the CMP's performance measures.

Programming Requirements

Metropolitan Planning Organizations in areas that fail to meet national ozone or carbon monoxide standards ("nonattainment" areas) must adhere to additional programming requirements due to the health and environmental risks posed by elevated pollutant levels. In these cases, federal funds cannot be allocated for projects significantly increasing single occupancy vehicle capacity unless a multi-modal analysis proves that demand cannot be met through travel demand or operational strategies. However, exceptions exist for safety improvements and bottleneck elimination. As of October 2021, the Bay Area region met carbon monoxide standards but not ozone standards.

Relationship Between CMP and Regional Planning Activities

MTC relies on a combination of regional initiatives, including Plan Bay Area, Vital Signs, and the TPM program to meet CMP requirements. Among these, Vital Signs serves as a monitoring tool, providing insights into current conditions and tracking historical trends. In contrast, Plan Bay Area establishes the overarching regional vision, outlining the steps and strategies to achieve it. Supplementing these, the Federal TPM program sets near-term performance targets, promoting informed funding choices that align with and advance the established vision.

Vital Signs: Launched in 2015 and revamped in 2023, [Vital Signs](#) is an interactive data portal serving as a comprehensive tool for tracking metrics in the San Francisco Bay Area. It monitors over 40 indicators across themes including transportation, land and people, economy, environment, and equity.

Vital Signs provides an extensive overview of the region's transportation landscape, offering easy-to-understand insights. These include transit ridership, commute patterns, commute mode choice, daily miles traveled, commute time, travel time reliability, miles traveled in congestion, and time spent in congestion. These insights are presented through advanced visualizations and concise data summaries.

This resource provides planners, decision-makers, and the public with essential information needed to identify challenges, evaluate potential solutions, and ultimately develop effective strategies.

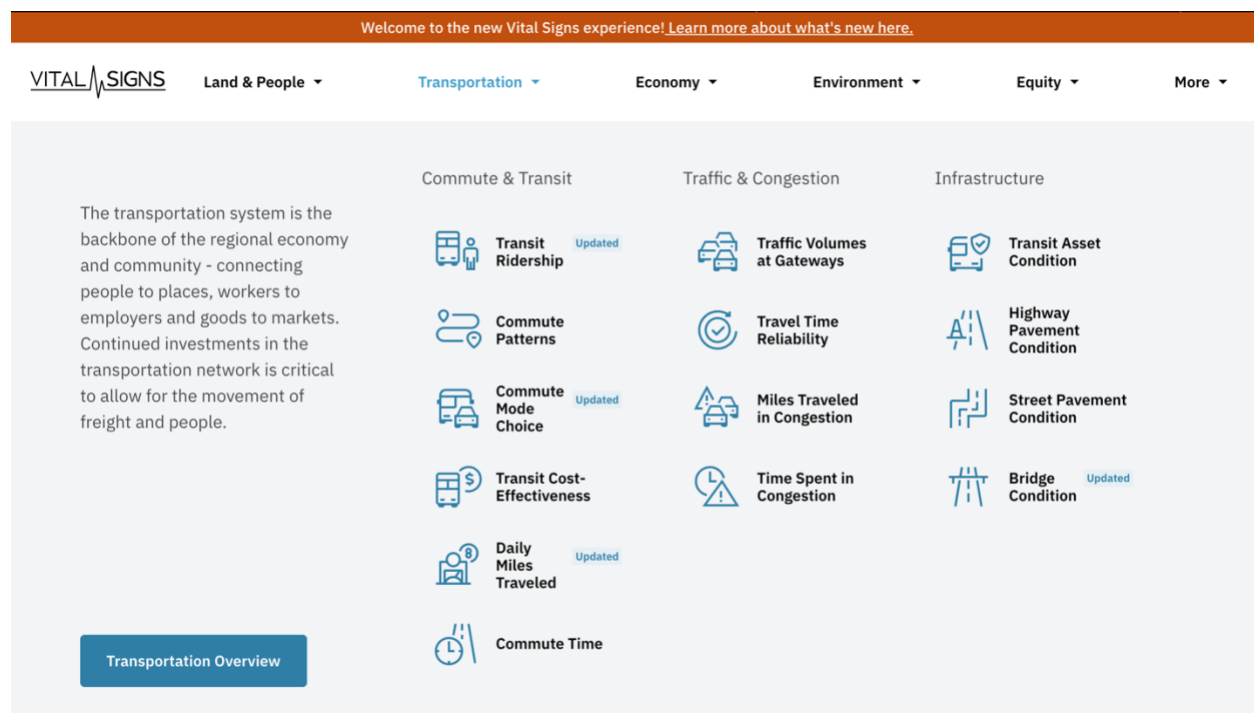


Figure 1. Vital Signs Transportation Indicators

Plan Bay Area 2050: Adopted in October 2021, [Plan Bay Area 2050](#) and is a comprehensive roadmap for the region's future. MTC and the Association of Bay Area Governments (ABAG) collaborated to create this plan, which serves as the Bay Area's Regional Transportation Plan (RTP) and Sustainable Communities Strategy (SCS). The plan is both a vision and a blueprint for the region's future, integrating transportation and land use to pave the way for sustainable development. The plan outlines strategies to improve transportation performance, with an emphasis on reducing vehicular travel, easing congestion, reducing travel times, and promoting environmental sustainability.

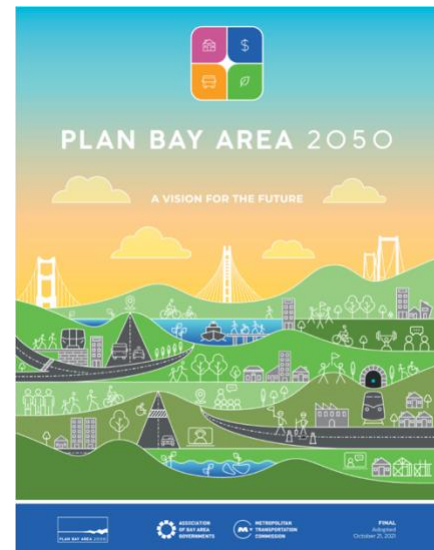


Figure 2. Plan Bay Area 2050 Cover

Transportation Performance Management (TPM): spearheaded by the Federal Highway Administration and the Federal Transit Administration, the TPM program is a nationwide initiative. The program directs transportation investment decisions based on national goals, promoting a shift towards performance-based planning and programming. The program is framed around the six national goals: Safety, Infrastructure Condition, System Reliability, Freight Movement and Economic Vitality, Congestion Reduction, and Environmental Sustainability.

This data-driven program fosters collaboration among state departments of transportation, Metropolitan Planning Organizations, and other stakeholders. A key emphasis of the TPM program is data collection and analysis to monitor performance. It encourages the gathering of accurate and reliable data related to transportation performance measures. These include traffic volumes, travel times, roadway conditions, safety incidents, among others.

State Departments of Transportation, Metropolitan Planning Organizations, and transit agencies establish targets for 28 performance measures in areas such as Safety, Infrastructure Condition, System Reliability, Freight Movement and Economic Vitality, Congestion Reduction, and Environmental Sustainability.

Chapter 2 - CMP Elements

The following section describes how MTC integrates each of the required CMP components.

1. Existing System Assessment

MTC uses a comprehensive range of tools and collaborative regional initiatives to monitor and evaluate the existing transportation system, addressing the first component of the Federal CMP.

Public Feedback and Surveys: During the four-year regional plan (“Plan Bay Area”) update cycle, MTC staff engages with Bay Area residents, ABAG and MTC Board members, and stakeholders to gather feedback on critical issues for consideration in planning for the next 20 to 30 years.

MTC also continuously collects and analyzes data to update its regional activity-based travel demand model, which informs agency studies and plans, including Plan Bay Area. Three efforts – the Transit Passenger Survey, Regional Transit Passenger Snapshot Survey, and Travel Diary Survey – collect trip and traveler data not readily available from other sources. More information on MTC’s survey program can be found at <https://mtc.ca.gov/tools-resources/survey-program>.

Regional Modeling: MTC uses an integrated model framework for simulating travel activity across the region. This framework enables planners to examine the complex interactions between land use and transportation strategies. The models are continuously updated to account for shifts in travel behavior and emerging transportation trends, such as autonomous vehicles.

The regional activity-based travel demand model serves as a tool for evaluating the effectiveness of land use and transportation strategies. The transportation strategies, made up of both capital projects and policies, are incorporated into the model on top of the existing transportation system. Once the strategies are integrated into the model framework, it becomes possible to simulate their impacts on regional travel activity. The travel model generates travel activity outputs including daily trips by mode, roadway traffic volumes, transit ridership, vehicle delay, vehicle miles traveled (VMT), and distribution of VMT by speed, among others.

Scenario Planning: MTC conducts scenario planning as part of the four-year Plan Bay Area development process. While occurring at separate phases of the development process, all scenario planning initiatives use the integrated model framework to assess the outcomes of various combinations of land use and transportation strategies against a set of performance measures.

Project Performance Assessment: MTC conducts a project performance assessment, focusing on both capital-intensive capacity expansion projects and operational strategies. This assessment makes extensive use of the integrated model framework to evaluate the specific impacts of individual projects.

The outputs generated by the regional activity-based travel demand model are translated into monetary terms to establish a societal benefit-cost ratio. This ratio quantifies the effects of the projects on various

factors, including travel times, travel costs, modal accessibility, freeway reliability, vehicle ownership, transit crowding, environmental emissions, natural land loss, health, and safety.

Performance Metrics: MTC’s website hosts a variety of data sets designed to monitor system performance, with one notable resource being the [Vital Signs](#) platform, which offers data, visual representations of that data and written explanations about important trends in the Bay Area.

Starting in 2019, MTC has expanded its data reporting by providing [monthly transportation statistics](#), including data on vehicle traffic and public transit ridership. These statistics encompass a range of metrics, such as the average weekday BART station exits, the number of physical Clipper cards and digital Clipper cards in use, trips taken in the Bay Wheels bike share network, FasTrak accounts in use, one-way toll crossings for the Bay Bridge, combined crossings for the other toll bridges, 511 phone and website users, assists by the Freeway Service Patrol, and the average wait time (in minutes) for Freeway Service Patrol assistance.

Federal TPM Program: the TPM program places a strong emphasis on data collection and analysis to effectively monitor performance. The analysis of this data plays a role in MTC’s assessing system performance. MTC uses the data to pinpoint specific areas that may require attention or enhancement, thereby helping informed decision-making and resource allocation for improving transportation systems.

Local Initiatives: In addition to MTC’s regional initiatives, county transportation agencies in the Bay Area monitor their local transportation system’s performance. California law requires Congestion Management Agencies to create county-level Congestion Management Programs (state CMPs) biennially unless a county opts out. Currently, six of the nine Bay Area counties are developing state CMPs, while three have opted out. These state CMPs require multimodal performance monitoring, in which agencies collect and analyze travel data to evaluate performance using metrics such as level of service, VMT, average travel speed, buffer time index, and others.

2. Goals, Objectives, and Performance Measures

Setting the Regional Vision

During the Plan Bay Area 2050 development process, MTC staff collaborated with over 1,000 Bay Area residents, ABAG and MTC Board members, and various stakeholders to identify the most pressing issues for consideration when planning for life in 2050. This extensive engagement led to the adoption of Plan Bay Area 2050’s vision, guiding principles, and cross-cutting issues in September 2019. Please refer to Table 1 for more details.

Table 1. Plan Bay Area 2050 Cross-Cutting Themes, Vision, and Guiding Principles

CROSS-CUTTING THEMES	RESILIENCE AND EQUITY
Vision	To ensure by the year 2050 that the Bay Area is affordable, connected, diverse, healthy, and vibrant for all.
GUIDING PRINCIPLE	DESCRIPTION
AFFORDABLE	All Bay Area residents and workers have sufficient access to housing options they can afford – households are economically secure.
CONNECTED	An expanded, well-functioning, safe and multimodal transportation system connects the Bay Area – fast, frequent, and efficient intercity trips are completed by a suite of local transportation options, connecting communities, and creating a cohesive region.
DIVERSE	Bay Area residents support an inclusive region where people from all backgrounds, abilities and ages can remain in place – with access to the region’s assets and resources.
HEALTHY	The region’s natural resources, open space, clean water, and clean air are conserved – the region actively reduces its environmental footprint and protects residents from environmental impacts.
VIBRANT	The Bay Area is an innovation leader, creating quality job opportunities for all and ample fiscal resources for communities.

Assessing the Plan’s Performance Against the Regional Vision

Performance measures were selected to assess strategy effectiveness in alignment with the plan's vision and guiding principles, as outlined in Table 2. This involves using the integrated regional modeling framework to simulate the plan’s impacts, enabling the analysis of the effects of individual strategies and the combinations of strategies.

Among the guiding principles, "Connected" and "Healthy" are most intricately linked to congestion. Performance measures include per capita GHG emissions from transportation and commute mode share, promoting coordinated land use and transportation planning, highlighting the transportation system's role in connecting people to job opportunities. Another measure is peak-hour travel time on freeway corridors, evaluating travel times between 10 origin-destination pairs (city-to-city) to gauge regional commute flow efficiency during peak congestion periods.

The per capita GHG emissions reductions performance target is a statutory target established by the California Air Resources Board (CARB) pursuant to Senate Bill 375. The target applies to passenger vehicles and reductions are relative to 2005 levels. As a result, this target links land use and transportation strategies to lead to reductions in per capita VMT, and ultimately reductions in GHG emissions.

For more information on the performance measures in Plan Bay Area 2050, please consult the [Performance Report](#).

Table 2. Plan Bay Area 2050's Performance Measures.

GUIDING PRINCIPLE	QUESTION	PERFORMANCE MEASURE
AFFORDABLE	Will Bay Area residents spend less on housing and transportation?	<i>Housing and transportation cost as a share of household income</i> <i>Average transportation expenses per trip (fare, out-of-pocket auto costs, parking costs, tolls)</i>
	Will the Bay Area produce and preserve more affordable housing?	<i>Share of housing that is deed restricted affordable</i>
		<i>Share of new housing production that is deed-restricted affordable</i>
		<i>Share of at-risk affordable housing preserved as permanently affordable</i>
CONNECTED	Will Bay Area residents be able to access their destinations more easily?	<i>Number and share of total jobs that are accessible by:</i> <ul style="list-style-type: none"> • 30 min auto • 45 min transit • 20 min bike • 20 min walk
		<i>Share of households located near high-frequency transit (0.5 mi)</i>
		<i>Share of jobs located near high frequency transit (0.5 mi)</i>
	Will Bay Area residents have a transportation system they can rely on?	<i>Freeway corridor peak-hour travel time (minutes)</i>
<i>Percent of person hours in transit spent in crowded conditions, by transit operator</i>		
<i>Share of transit assets that are not in a state of good repair</i>		
DIVERSE	Will Bay Area communities be more inclusive?	<i>Share of households that are households with low incomes</i> <i>Homeownership rate for households with low incomes</i>
	Will Bay Area residents be able to stay in place?	<i>Share of neighborhoods (census tracts) that experience loss in households with low incomes over plan period</i>
HEALTHY	Will Bay Area residents be healthier and safer?	<i>Share of households in risk prone areas that are protected from risk:</i> <ul style="list-style-type: none"> • Sea level rise/flooding risk • Earthquake risk • Wildfire risk
		<i>Reduction in building risk exposure to damage from earthquake or wildfire</i>
		<i>Annual road fatalities/serious injuries per 100,000 residents</i>
		<i>Daily PM2.5 emissions</i>
	Will the environment of the Bay Area be healthier and safer?	<i>Parks and trails per thousand residents</i> <i>GHG emissions from transportation per capita (cars and light-duty trucks only and all vehicles)</i> <i>Commute mode share</i>

		<i>Existing residential building stock efficiency (CO₂, energy, and water)</i>
VIBRANT	Will jobs and housing in the Bay Area be more evenly distributed?	<i>Jobs-housing ratio</i>
		<i>Mean one-way commute distance</i>
VIBRANT	Will the Bay Area economy thrive?	<i>Growth in GRP per capita (2020 dollars) between 2015-2050</i>
		<i>Job growth by industry wage level</i>

The Federal TPM Program and Near-Term Targets

The Federal TPM program complements the vision and performance measures established in Plan Bay Area by establishing near-term targets. These targets are either set on an annual or four-year basis. This target-setting process encourages collaboration among State Departments of Transportation, Metropolitan Planning Organizations, and transit agencies, ensuring a coordinated approach to enhancing transportation performance nationwide.

Specifically, congestion-oriented targets follow a four-year performance interval. In June 2023, MTC submitted targets for the second four-year performance period, focusing on measures related to system reliability, freight movement and economic vitality, and congestion reduction. During this period, MTC endorsed state targets for system reliability and freight movement and economic vitality. Simultaneously, collaborative efforts with Caltrans led to the establishment of regional targets for congestion reduction, as detailed in Table 3.

Table 3. MTC's Second Cycle 4-year Congestion Reduction and System Reliability Performance Targets

GOAL	PERFORMANCE MEASURE	BASELINE (REGION)	2023 TARGET	2025 TARGET	
Congestion Reduction	Annual hours of peak-hour excessive delay per capita by urbanized area	San Francisco-Oakland UA	18.3	17.9	17.6
		San Jose UA	13.7	13.4	13.2
		Concord UA	16.0	15.7	15.4
		Santa Rosa UA	6.6	6.5	6.3
		Antioch UA	6.5	6.4	6.2
	Percent of non-single-occupancy vehicle (SOV) travel by urbanized area	San Francisco-Oakland UA	49.8%	50.8%	51.8%
		San Jose UA	33.5%	34.5%	35.5%
		Concord UA	39.5%	40.5%	41.5%
		Santa Rosa UA	25.1%	26.1%	27.1%

	Antioch UA	31.2%	32.2%	33.2%
System Reliability and Freight Movement and Economic Vitality Targets	Percent of the person-miles traveled on the Interstate Highway System that are reliable	76.3%	74.3%	74.8%
	Percent of the person-miles traveled on the non-Interstate National Highway System that are reliable	82.0%	84.2%	84.7%
	Truck travel time reliability index	1.9	1.6	1.6

While some of the TPM measures above, like mode share, mirror the plan measures, other measures focus on traffic operations. Conversely, given the long-range nature of Plan Bay Area 2050, the measures focus on changes in demand over time and how land use and transportation strategies can affect travel activity in a growing region.

3. Data Collection Strategy

MTC collects data from various sources to support the CMP. Among these sources are:

- Public Feedback and Surveys, such as the Transit Passenger Survey, Regional Transit Passenger Snapshot Survey, and Travel Diary Survey collect trip and traveler data not readily available from other sources.
- FHWA Highway Performance Monitoring System and Caltrans Performance Measurement System (PeMS) for vehicular travel data such as VMT.
- The National Performance Management Research Data Set (NPMRDS) contains field-observed travel time and speed data collected anonymously from a fleet of probe vehicles (cars and trucks) equipped with mobile devices for vehicular data such as peak hour excessive delay (PHED) and level of travel time reliability (LOTTR).
- INRIX, a company that collects real-time traffic information from various sources like GPS locator devices and mobile phone data, for highway operations data, including time spent in congestions and travel time reliability.
- California’s Statewide Integrated Traffic Records System (SWITRS) and the National Highway Traffic Safety Administration’s Fatality Analysis Reporting System for safety data.
- The American Community Survey (ACS) is an ongoing survey conducted by the U.S. Census Bureau. It collects information on demographic, social, economic, and housing characteristics of the U.S. population every year.
- The Federal Transit Administration’s National Transit Database (NTD) for transit ridership data, and transit agencies’ General Transit Feed Specification (GTFS) for transit routing and schedule data.

- MTC conducts its own transportation data collection by supporting bicycle counters and running a transit passenger survey program.
- Land use data is critical for complying with the California Senate Bill 375, and MTC sources it from County Tax Assessor information, real estate listing databases, local development pipeline inventories, local General Plans, and local zoning documents. MTC has also initiated the Bay Area Spatial Information System (BASIS) effort to develop a standardized set of land use designations.
- MTC gathers data on areas projected to be impacted by rising sea levels from the California Ocean Protection Council to help understand the need for resilience investments throughout the region.

4. Strategy Identification and Assessment

Identifying Regional Strategies

Plan Bay Area 2050's transportation element is comprised by a list of prioritized transportation policies and projects. These are structured across 12 strategies, falling under three themes: maintain and optimize the existing system, create healthy and safe streets, and build a next-generation transit network. Each strategy integrates specific policies and projects, supported by a fiscally constrained transportation project list set for the next 30 years.

MTC solicited these policies and projects through a collaborative process that allowed public agencies and members of the public to submit proposals for consideration into Plan Bay Area 2050's fiscally constrained project list. These policies and projects are sourced from localized planning efforts, including county transportation plans, modal plans, community-based plans, corridor plans, and other regional and local planning initiatives. These strategies and projects are often subject to initial performance analyses prior to their nomination to MTC, ensuring alignment with plan or corridor visions, goals, and objectives.

The [Horizon](#) initiative, a precursor exploratory planning effort to Plan Bay Area 2050, also identified regional transportation strategies for consideration in Plan Bay Area 2050. A broad range of strategies were identified and compiled from a variety of sources, including [Perspective Papers](#) and stakeholder feedback.

Assessing Regional Strategies

To begin evaluating the strategies, Horizon's [Futures](#) scenario planning effort relied on MTC's integrated regional land use model and regional activity-based travel model to assess the impact of these strategies across three distinct "Future" scenarios. The aim was to evaluate the potential impact of uncertain future conditions on a broad and visionary set of transportation strategies and projects. The effectiveness of these strategies was then evaluated across the three Futures.

In addition, nearly 100 of the costliest policies and projects were evaluated in the [Project Performance Assessment](#). For Plan Bay Area 2050 and the preceding two iterations, MTC has evaluated the

performance of higher-cost, capacity increasing transportation projects, including freeway expansions, transit expansions, and transit frequency boosts and others. The assessment evaluated potential impacts on safety, congestion, environmental sustainability, among other factors, see Figure 3 below. The projects were evaluated for their cost-effectiveness, equity impact, and for their alignment with the Plan Bay Area’s vision and guiding principles. Like the Futures scenario planning effort, the regional activity-based travel model was used to evaluate the proposals in across the three Futures.

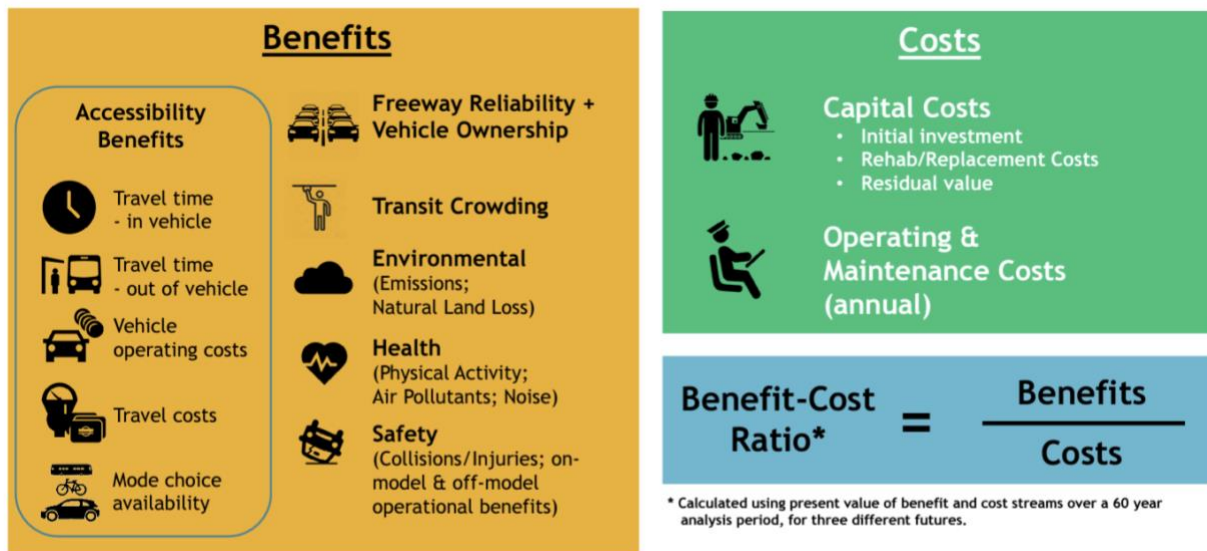


Figure 3. Project Performance Assessment Societal Benefit-Cost Assessment Components

Given the plan’s fiscal constrain requirements, the findings from the Project Performance Assessment were critical in crafting the transportation strategies comprised of optimized packages of policies and projects. The findings provided a better understanding of how project benefits vary under different external conditions, and how the performance of projects could be enhanced through changes in scope or additional policy commitments.

Overall, the policies and projects that proved to be effective across multiple future scenarios were deemed more resilient to future uncertainties and were refined for inclusion in Plan Bay Area 2050. More information can be found in the [Forecasting and Modeling Report](#) and the [Performance Report](#).

These strategies then went through the two-phase [Blueprint](#) planning process. The Draft Blueprint integrated 25 high performing strategies – comprised of policies and projects – to advance the plan vision. The Draft Blueprint strategies were evaluated against the plan’s performance measures and the outcomes were shared for feedback. The Draft Blueprint’s strategies were refined and expanded in the Final Blueprint phase. The Final Blueprint expanded from 25 to 35 strategies to make further progress on outstanding challenges identified in the Draft Blueprint analysis while also integrating public feedback.

Strategy List

The federal CMP guidance specifies five types of strategies: demand management measures, traffic operational improvements, public transportation improvements, ITS technologies, and additional system capacity. Plan Bay Area 2050 includes a total of 12 transportation strategies, five environment strategies, one economy strategy, and one housing strategy that fall into these categories. Other strategies in the plan aim to achieve climate resilience, housing affordability, and economic development objectives.

Demand Management Measures

- **Strategy T5:** Implement per-mile tolling on congested freeways with transit alternatives. Apply a per-mile charge on auto travel on select congested freeway corridors where transit alternatives exist, with discounts for carpoolers, low-income residents, and off-peak travel; and reinvest excess revenues into transit alternatives in the corridor.
- **Strategy T7:** Advance other regional programs and local priorities. Fund regional programs like Clipper and 511, while supporting local transportation investments on arterials and local streets.
- **Strategy EN4:** Maintain urban growth boundaries. Using urban growth boundaries and other existing environmental protections, focus new development within the existing urban footprint or areas otherwise suitable for growth, as established by local jurisdictions. This strategy supports infill development, reducing overall auto demand and supporting demand for shared and active transportation.
- **Strategy EN7:** Expand commute trip reduction programs at major employers. Set a sustainable commute target for major employers as part of an expanded Bay Area Commuter Benefits Program, with employers responsible for funding incentives and disincentives to shift auto commuters to any combination of telecommuting, transit, walking and/or bicycling.
- **Strategy EN9:** Expand transportation demand management initiatives. Expand investments in programs like vanpools, bikeshare, carshare and parking fees to discourage solo driving.
- **Strategy H3:** Allow a greater mix of housing densities and types in Growth Geographies. Allow a variety of housing types at a range of densities to be built in Priority Development Areas, select Transit-Rich Areas, and select High-Resource Areas.
- **Strategy EC4:** Allow greater commercial densities in Growth Geographies. Allow greater densities for new commercial development in select Priority Development Areas and Transit-Rich Areas to encourage more jobs to locate near public transit.



Figure 4. Plan Bay Area 2050's Highway and Pricing Investments

Traffic Operational Improvements

- **Strategy T6:** Improve interchanges and address highway bottlenecks. Rebuild interchanges and widen highway bottlenecks to achieve short- to medium-term congestion relief.
- **Strategy T7:** Advance other regional programs and local priorities. Fund regional programs like Clipper and 511, while supporting local transportation investments on arterials and local streets.
- **Strategy T8:** Advance regional Vision Zero policy through street design and reduced speeds. Reduce speed limits to between 20 and 35 miles per hour on local streets and 55 miles per hour on freeways, relying on design elements on local streets and automated speed enforcement on freeways.
- **Strategy EN1:** Adapt to sea level rise. Protect shoreline communities affected by sea level rise, prioritizing low-cost, high-benefit solutions, and providing additional support to vulnerable populations. This includes protecting highway and rail routes that are projected to be adversely impacted by sea level rise, including State Route 37, U.S. Route 101, and Sonoma Marin Rapid Transit service in the North Bay, U.S. Route 101 on the Peninsula, State Route 237 and Valley Transportation Authority Light Rail in the South Bay, and Interstate 880 in the East Bay.

Public Transportation Improvements

- **Strategy T3:** Enable a seamless mobility experience. Eliminate barriers to multi-operator transit trips by streamlining fare payment and trip planning while requiring schedule coordination at timed transfer hubs.
- **Strategy T4:** Reform regional transit fare policy. Streamline fare payment and replace existing operator- specific discounted fare programs with an integrated fare structure across all transit operators.
- **Strategy T10:** Enhance local transit frequency, capacity and reliability. Improve the quality and availability of local bus and light rail service, with new bus rapid transit lines, South Bay light rail extensions, and frequency increases focused in lower-income communities.
- **Strategy T11:** Expand and modernize the regional rail network. Better connect communities while increasing frequencies by advancing the Link21 new transbay rail crossing, BART to Silicon Valley Phase 2, Valley Link, Caltrain Downtown Rail Extension and Caltrain/High-Speed Rail grade separations, among other projects.
- **Strategy T12:** Build an integrated regional express lanes and express bus network. Complete the buildout of the regional express lanes network to provide uncongested freeway lanes for new and improved express bus services, carpools and toll-paying solo drivers.

ITS Technologies

Strategy T6 incorporates Intelligent Transportation Systems (ITS) to improve interchanges and reduce highway bottlenecks. Bay Area Forward is a project under this strategy and consists of a collection of initiatives aimed at improving commuting experiences and reducing greenhouse gas emissions. ITS

components of the Bay Area Forward initiative include transit signal prioritization, optimized corridor management, traffic signal upgrades, arterial signal timing, and adaptive ramp metering.

Strategy T7 also includes investments in regional systems and programs, including investments in the 511 Bay Area Program, which provides multi-modal traveler information; All-Electronic Tolling Program, which converts the seven state-owned toll bridges to Open Road Tolling; Connected Bay Area Program, which improves and integrates system infrastructure and operations to manage the region's transportation network such as the Regional Communication Infrastructure Network, the Incident Management Program, and the Transportation Management Center & Communications; Motorist Aid Services Program, which supports the Freeway Service Patrol, Call Box programs and other motorist aid activities.

Additional System Capacity

Limited roadway widenings are included in Strategies T6, T7, and T12. In Strategy T6, highway capacity increases are typically used to support safety or bottleneck elimination. In Strategy T7, roadway capacity increases are limited to minor roadways. The regional express lane network component of Strategy T12 prioritizes converting high-occupancy vehicle lanes or general-purpose lanes to express lanes, though a limited number of new lanes are included based on geometries and demand analyses.

A subset of these roadway capacity projects was evaluated in the Project Performance Assessment and all were evaluated in the Blueprint planning process, which assessed their impacts on regional travel activity. Prior to being nominated for consideration in Plan Bay Area 2050, these capacity increasing projects were evaluated through local and corridor planning processes. Lastly, prior to implementation, these capacity increasing projects are subject to CEQA and must undergo project level analyses and alternatives assessment, to disclose the potential impacts of implementing the project or one of its alternatives.

Other Strategies with a Transportation Nexus

While these strategies do not directly correspond to any of the five types of strategies specified in the federal CMP guidance, they do support the CMP's goals and provide significant safety, accessibility, and equity benefits.

- **Strategy T1:** Restore, operate and maintain the existing system. Commit to operate and maintain the Bay Area's roads and transit infrastructure while reversing pandemic-related cuts to total transit service hours.
- **Strategy T2:** Support community-led transportation enhancements in Equity Priority Communities. Provide direct funding to historically marginalized communities for locally identified transportation needs.
- **Strategy T7:** Advance other regional programs and local priorities. Fund regional programs like motorist aid and 511 while supporting local transportation investments on arterials and local streets.
- **Strategy T8:** Build a Complete Streets network. Enhance streets to promote walking, biking and other micro-mobility through sidewalk improvements, car-free slow streets, and 10,000 miles of bike lanes

or multi-use paths.

- **Strategy EN8:** Expand clean vehicle initiatives. Expand investments in clean vehicles, including more fuel-efficient vehicles and electric vehicle subsidies and chargers.

Expected Benefits

The [Outcomes](#) chapter of Plan Bay Area 2050 summarizes the expected benefits of implementing all 35 strategies, while the Performance Report provides more detailed information on performance. This report forecasts performance measures related to the CMP, such as the proportion of commuters who use different modes of transportation, greenhouse gas emissions per capita, the number of injuries and fatalities on roadways, and the duration of peak-hour travel times on freeways across different corridors.

While forecasting the plan's outcomes across the federal TPM program was not feasible due to model limitations, a qualitative assessment was done to show how the plan's 35 strategies interface with the federal vision. The findings concluded that Plan Bay Area 2050 advances the federal goal areas of safety, infrastructure condition, system reliability, freight movement and economic vitality, congestion reduction and environmental sustainability. See the [Performance Report](#) for more information.

Commute Mode Share

In 2015, half of Bay Area residents drove alone to work, a figure that is expected to fall to 44% by 2050 if current trends continue. However, the implementation of Plan Bay Area 2050 strategies is expected to result in a greater decrease, with only 33% of residents driving alone. The promotion of transit, active transportation, and telecommuting options is expected to be the primary cause of this decrease. Plan Bay Area 2050 encourages transit-friendly development patterns, transportation demand management programs, and investments in shared and active transportation alternatives, all of which lead to increased use of these modes of transportation.

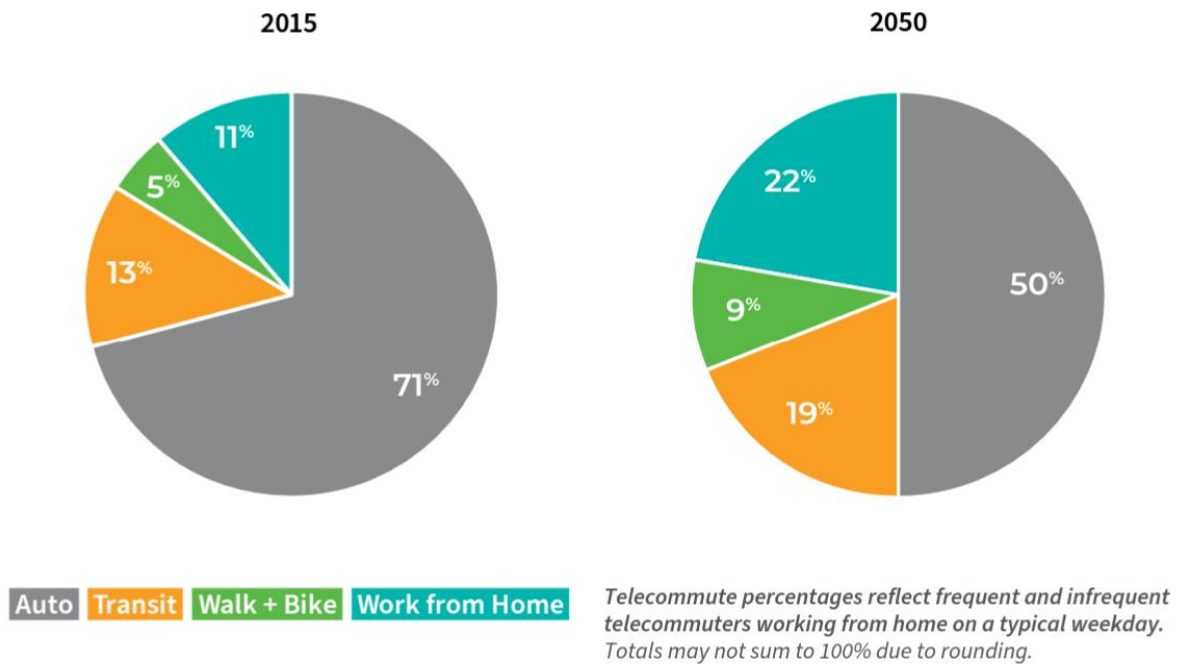


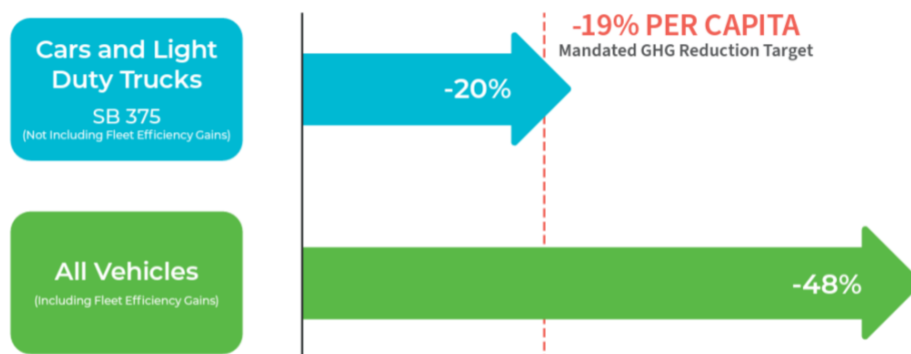
Figure 5. Plan Bay Area 2050 Forecasted Change in Mode Share, 2015 to 2050

Per-Capita Greenhouse Gas Emissions

As previously stated, California Metropolitan Planning Organizations, including MTC, are required to develop plans to reduce per-capita greenhouse gas emissions from passenger transportation, such as cars and light-duty trucks. State law also restricts how benefits from fleet efficiency gains are accounted for. By 2015, the Bay Area had reduced its per-capita emissions by 8% compared to 2005 levels, including all vehicles. If the region maintained current trends, the reduction by 2050 would be 43% lower than in 2005, as the transition to zero-emission vehicles continued. However, by implementing Plan Bay Area 2050’s strategies, the region can expect a 51% reduction in per-capita emissions relative to 2005 levels.

Table 4. Forecasted Daily GHG Emissions Per Capita

Daily CO2 Emissions per Capita, Relative to 2005	2015 Baseline	2050 No Project	2050 Plan
Cars and light-duty trucks (SB 375)	-1%	5%	-17%
All vehicles (including fuel efficiency gains)	-8%	-43%	-51%



NOTE: Under Senate Bill 375 (D. Steinberg, Statutes of 2008), emissions reductions from future improvements in vehicle fuel efficiency associated with state regulatory action do not count toward a region's greenhouse gas emissions reduction target.

Figure 6. Percent Reduction in Per Capita GHG Emissions from 2005 to 2035

Roadway Injuries and Fatalities

In 2021, MTC adopted a Regional Vision Zero policy with the goal of eliminating traffic fatalities and serious injuries in the Bay Area by 2030. While Plan Bay Area 2050 may not fully achieve this ambitious goal, it does include significant measures to reduce the number of adverse crash outcomes. This includes implementing a strategy to lower speed limits on freeways and select local streets.

Traffic collisions claimed the lives of approximately six Bay Area residents per 100,000 in 2015. Without action, this figure is expected to rise to 6.3 by 2050. However, by implementing Plan Bay Area 2050's strategies, this figure is expected to decrease to 4.9 by 2050. With the help of Plan Bay Area 2050, serious injuries are expected to decrease from 26 per 100,000 residents in 2015 to 23 by 2050.

Table 5. Forecasted Annual Incidents on Bay Area Roadways

Annual Incidents per 100,000 Residents	2015 Baseline	2050 No Project	2050 Plan
Fatalities	6.0	6.3	4.9
Injuries	26.0	27.4	23.0

Freeway Peak-Hour Travel Time by Corridor

To address the potential increase in travel times caused by a growth region, Plan Bay Area 2050 includes a strategy to implement all-lane tolling with discounts for carpoolers, off-peak travel, and low-income individuals. The goal of this strategy is to improve the reliability of the freeway network. According to projections, the No Project scenario for 2050 would result in significantly longer travel times than in 2015,

with some corridors taking more than twice as long. However, implementing Plan Bay Area 2050's strategies is expected to keep travel times comparable to 2015, particularly on corridors with all-lane tolling for most of the route.

Table 6. Forecasted Travel Times

Freeway Corridors Peak-Hour Travel Time (minutes)		2015 Baseline	2050 No Project	2050 Plan
Most of Route Features All-Lane Tolling	Oakland-San Francisco	30	55	29
	Vallejo-San Francisco	57	111	57
	Antioch-San Francisco	74	147	79
	Antioch-Oakland	47	94	52
	San Jose-San Francisco	64	83	69
	Oakland-Palo Alto	54	78	58
	Oakland-San Jose	56	81	59
Partial or No Tolling	Livermore-San Jose	48	102	66
	Fairfield-Dublin	47	57	51
	Santa Rosa-San Francisco	68	64	75

5. Implementation Planning

The [Implementation Plan](#) for Plan Bay Area 2050 outlines the steps required to implement each of the 35 strategies identified in the plan. The Implementation Plan was developed in collaboration with a wide range of stakeholders, including governmental agencies, environmental and equity organizations, labor organizations, businesses, and Bay Area residents. MTC's ability to implement each of the 35 strategies was assessed using four criteria: authority, financial resources, public and political support, and technical capacity. MTC's role in each strategy's implementation was identified as lead, partner, or support. Furthermore, the Implementation Plan identifies 80 specific actions for MTC to take over the next five years to move closer to Plan Bay Area 2050 implementation. These actions include legislative advocacy, planning studies, pilots, and changes to existing MTC policies and programs.

MTC's [Transportation Improvement Program](#) (TIP) is a list of transportation projects, programs, and investments with a federal interest, which means they will most likely receive federal funding or require federal agencies to act. It also includes regionally significant projects funded locally and by the state. The TIP marks the start of implementing the transportation strategies outlined in Plan Bay Area 2050. The TIP

identifies specific projects and programs to be implemented over a four-year period.

The 2023 TIP for the Bay Area, approved by MTC in September 2022, includes over 300 transportation projects totaling \$11 billion in federal, state, and local funding for federal fiscal years 2022-23 through 2025-26. However, the TIP typically does not include all regional transportation investments, such as locally funded transit operations, road maintenance projects, planning efforts, and minor sidewalk or intersection improvements. The 2023 TIP did not include any new project that required additional multi-modal analysis for potential impacts on single occupancy vehicle capacity. MTC recognizes Comprehensive Multimodal Corridor Plans and state and federal environmental review documentation as suitable methods for evaluating single occupancy vehicle capacity.

6. Performance Monitoring

Several MTC initiatives, including [Vital Signs](#), are used to monitor the performance of the Bay Area region, as discussed in the Existing System Assessment section. MTC, its partners, and the public can keep track of how regional policies, plans, projects, and programs, including Plan Bay Area 2050 implementation, impact various regional conditions such as average commute time and housing affordability by continuously monitoring through Vital Signs.

Similarly, Plan Bay Area is required to be updated every four years and as a result efforts to gather public feedback on their experiences and needs, scenario planning, simulation modeling, and cost-benefit analyses generally occur every four years as part of the plan development process.