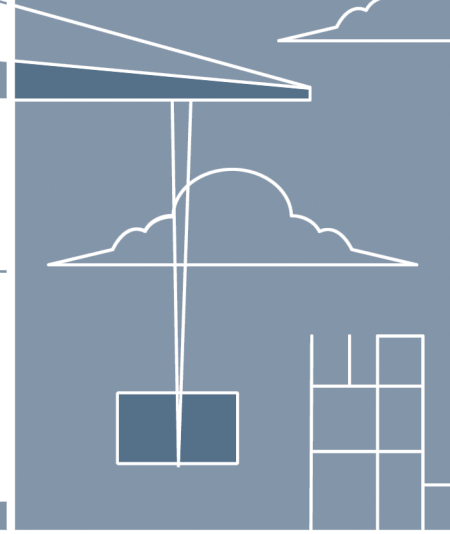




## INVESTMENT STRATEGY REPORT



# Plan BayArea 2040

DRAFT  
SUPPLEMENTAL  
REPORT

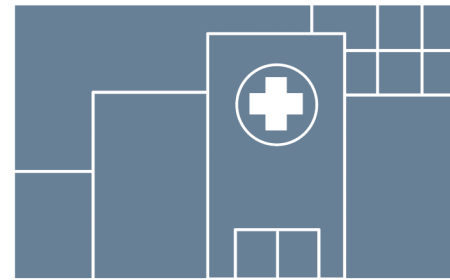


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MARCH 2017



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# Plan Bay Area 2040: Investment Strategy Report

March 2017



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## Executive Summary

The transportation investment strategy is the set of projects and programs — and associated funding — that supports Plan Bay Area 2040’s projected land use pattern and helps the region achieve its performance targets. Like in original Plan Bay Area, adopted in 2013, the proposed Plan Bay Area 2040 investment strategy focuses heavily on operating, maintaining and modernizing the existing transportation network, and prioritizing transportation improvements connecting Priority Development Areas and job centers.

Transportation investment priorities for the Draft Plan reflect a continuing commitment to “Fix It First.” Approximately 90 percent of Plan Bay Area 2040’s investments focus on operating, maintaining and modernizing the existing transportation system. Plan Bay Area 2040 also directs almost two-thirds of future funding to investments in public transit, mostly to ensure that transit operators can sustain existing service levels through 2040.

### Investment Strategy Summary for Plan Bay Area 2040

Investment Strategy	Project/Program Description	Amount
<b>Operate and Maintain</b>	Replace transit assets, operate and maintain local streets and state highways, and operate the transit system.	\$218 billion
<b>Modernize</b>	Improve the existing system without significantly increasing the geographical extent of the infrastructure. Major investments in this category include: electrifying Caltrain and completing portions of the express lane network.	\$49 billion
<b>Expand</b>	Extend fixed-guideway rail service or add lanes to roadways. Major investments in this category include: extending Caltrain to downtown San Francisco and BART into Silicon Valley, as well as implementing express lanes on U.S. 101 in San Mateo and Santa Clara counties.	\$31 billion
<b>Debt Service and Cost Contingency</b>	Ongoing debt service and financing costs, as well as a cost contingency for expansion projects.	\$5 billion
<b>Total</b>		\$303 billion

The projects and programs included in Plan Bay Area 2040 are listed individually and mapped, where applicable, in the [Online Project Database](#).

## Introduction

The Draft Plan's investment priorities for the next 24 years focus on operating and maintaining the existing transportation system, modernizing transit and highways, and expanding the system in select locations to accommodate growing job centers and Priority Development Areas. This supplemental report describes the methodology for creating the investment strategy, determining investment categories, and identifying funding programs for implementing major transit priorities.

At its core, the investment strategy is a list of transportation priorities that could be implemented with funding that reasonably can be expected over the next 24 years. These priorities include specific projects, such as the proposed Phase 2 BART extension to Silicon Valley, as well as multi-project transportation programs like Alameda County's Bicycle and Pedestrian Program. Most of the projects and programs in the list are included for all phases through construction, though some are included solely for planning or pre-construction phases. All Plan investments are fiscally constrained.

## Considerations

Creating the investment strategy starts with an assessment of the funding required to operate and maintain existing services and an identification of regional expansion and modernization priorities. Caltrans, county congestion management agencies (CMAs), transit agencies and others submitted expansion and modernization recommendations through a four-month Call for Projects that stretched from May to September 2015. Development of the investment strategy evolved through scenario planning, performance evaluation, and subsequent application of fiscal constraint (e.g. determining which projects can fit within the region's transportation budget). This effort relies on substantial data from CMAs, transit operators, local jurisdictions, Caltrans, non-governmental organizations and other transportation stakeholders.

## Estimating Costs to Operate and Maintain Existing System

MTC worked with local jurisdictions, transit operators, and the California Department of Transportation (Caltrans) to develop cost estimates for operating and maintaining the Bay Area's transit system, local street and road network, the state highway system, and local and regional bridges.

The costs to operate and maintain the highway system also includes a growing need to maintain the hardware required for traffic management projects like ramp meters and dynamic signs. As shown in Table 1, to reach a state of good repair – meaning that roads are maintained at their optimum levels, transit assets are replaced at the end of their useful lives and existing service levels for public transit are maintained – the Bay Area will need to spend an estimated total of \$254 billion over the next 24 years.

**Table 1. Costs to operate and maintain the existing transportation system.**

Mode	Cost to Maintain Existing Asset Condition (\$ Billions)	Cost to Achieve Ideal Asset Condition (\$ Billions)
Local Streets and Roads	\$43	\$49
State Highways <sup>1</sup>	\$20	\$20
Local Bridges <sup>1</sup>	\$2	\$2
Regional Bridges <sup>1</sup>	\$16	\$16
Transit Capital	\$29	\$47
Transit Operating <sup>2</sup>	\$120	\$120
<b>Total</b>	<b>\$230</b>	<b>\$254</b>



Mode	Cost to Maintain Existing Asset Condition (\$ Billions)	Cost to Achieve Ideal Asset Condition (\$ Billions)
in year-of-expenditure dollars		
<b>Notes:</b> Costs associated with maintaining existing conditions are not available for highways and bridges, so the costs for ideal asset condition are listed in both categories. Transit operating costs are only for maintaining existing conditions.		

Full detail on forecasting maintenance and operations needs for the existing transportation system can be found in these supplemental reports: Local Streets and Roads, Bridges, and State Highway Needs Assessment and Transit Operating and Capital Needs and Revenue Assessment. These reports can be found here: <http://2040.planbayarea.org/reports>

## Requests for Modernization and Expansion Projects

MTC also worked with partner agencies to determine funding needs for projects that would expand capacity and increase system efficiency beyond operating and maintaining the existing system. In the Call for Projects for Plan Bay Area 2040, transportation agencies requested almost \$200 billion for these types of projects. These requests reflect planning work conducted outside of the regional transportation plan process. Key supportive planning efforts are described in this section.

**Countywide Transportation Plans and Modal Plans** - congestion management agencies for each of the Bay Area's nine counties must develop a Congestion Management Program (CMP), which concludes with a seven-year Capital Improvement Program. Countywide transportation plans (CTPs) are long-term plans within which the CMP must fit. Although CTPs are voluntary, eight of the region's nine counties complete them regularly. These countywide plans constitute one of the primary foundations for the regional transportation plan, reflecting a bottoms-up approach for crafting Plan Bay Area 2040's transportation investment strategy. The countywide plans evaluate short-term and long-term pedestrian, bicycle, highway, transit, and trail needs in each county, and develop project recommendations for the regional transportation plan.

**Transit Studies** – The [Core Capacity Transit Study](#) – evaluated transportation needs within the San Francisco-Oakland Bay Bridge corridor, the most congested in the region. Given existing demands on the Bay Bridge, the study evaluated medium-term solutions for accommodating future demand by transit, which was a key input to the transit strategy in the regional plan. Two of the region's largest transit operators – BART and SFMTA – also completed planning efforts that have fed into the long-range Plan. This includes BART's Sustainable Communities Operations Analysis (SCOA), which forms the basis for their BART Metro and Transbay Core Capacity projects, and SFMTA's Transit Effectiveness Project (TEP), which forms the basis for their Muni Forward project.

**Regional and Alameda County Goods Movement Plans** – these plans evaluated goods movement goals, challenges and opportunities for the Bay Area. The plans recommended three strategies – sustainable global competitiveness for the Port of Oakland, smart deliveries and operations through investment in ITS infrastructure, and modernizing infrastructure through operational improvements on the road network, improving safe access to industrial corridors and facilities, reducing land use conflicts along freight corridors, and improving last-mile truck routes and rail connections to existing and emerging industries. Projects from these strategies form the basis for the goods movement strategy of the Draft Plan.

**Airport Plans** – Airports are key pieces of any major metro area's transportation network. Bay Area airports fuel our regional economy as job centers, cargo hubs and gateways for visitors. Regional

agencies work with Bay Area airports and the Federal Aviation Administration (FAA) to plan for future airport improvements that benefit travelers, promote economic growth and protect the environment. MTC tracks airport activity as one of its indicators on Vital Signs and periodically evaluates long-term airport development decisions in Regional Aviation Activity Tracking Reports. While many airport development projects are not required to be included in the regional transportation plan, access improvements along nearby highway and transit facilities, as well as other infrastructure enhancements, ultimately are incorporated into the plan.

## Revenue Forecast

Combined with the funding required to provide existing transit service and improve asset conditions, identified transportation needs and project requests for the region between now and 2040 totaled nearly half a trillion dollars. Not all of the requests can be accommodated in the Draft Plan, because Draft Plan relies on a revenue forecast that constrains the number and cost of transportation projects.

The revenue forecast uses financial models to estimate how much money will be available for transportation purposes over the next 24 years. Plan Bay Area 2040 includes a total forecast of \$303 billion, estimated in year of expenditure (YOE) dollars. Like other metropolitan regions, the Bay Area receives an array of federal, state, regional, and local dollars for transportation. What differentiates the Bay Area is the preponderance of local and regional sources as a relative share of the total — approximately two-thirds of forecasted revenues are from regional and local sources such as transit fares, dedicated sales tax programs, and bridge tolls.

The majority of transportation funding (\$229 billion) is committed to specific purposes or projects either by the nature of the revenue source or by voter-approved county sales tax measures and past regional bridge toll increases. Further, projects also could have prior funding commitments due to the ongoing timeline of the project. Funding for these committed projects and programs is included in the Plan in order to provide a complete picture of the regional investments and so that these critical efforts can continue to advance, often with additional future regional funding.

The remaining revenues are considered “discretionary,” meaning they can be flexibly applied to various transportation purposes within the constraints of the funding source. Discretionary funds are important not only because of their flexibility, but also because they reflect future revenues the region can leverage to influence policy and implementation. These future discretionary revenues total \$74 billion, approximately 24 percent of the total projected Plan Bay Area 2040 revenues, as shown in Table 2.

**Table 2. Discretionary funding by fund source.**

Fund Source	Discretionary Funding (\$ Billions)
Federal: FTA Programs for Transit Capital, STP/CMAQ, New Starts/Small Starts/Core Capacity, National Highway Freight Program	\$27
State: Cap and Trade, STA, High Speed Rail, STIP, ATP	\$8
Regional: Future regional gas tax and bridge toll increases, AB1107, and remaining revenue from existing bridge tolls <sup>1</sup>	\$13
Local: TDA	\$13
Anticipated/Unspecified <sup>2</sup>	\$14

Fund Source	Discretionary Funding (\$ Billions)
<b>Total</b>	<b>\$74</b>
in year-of-expenditure dollars	
Notes	
1. These revenues do not include future express lane toll revenues, which are considered committed revenues.	
2. Anticipated revenues reflect new state and federal revenues that are unknown at this time but likely to fund transportation projects in the region during the Plan period.	

For more detail on the assumptions underlying the revenue forecast for Plan Bay Area 2040, see the Financial Assumptions Supplemental Report, which can be found here:

<http://2040.planbayarea.org/reports>

## Scenario Planning

As Plan Bay Area 2040 is a combined transportation and land use plan, developing the transportation strategy also involves evaluating different sets of transportation investments against different potential land use patterns. In the scenario planning process, MTC and ABAG developed and evaluated three alternative land use and transportation scenarios illustrating the effects that different housing, land use and transportation strategies would have on adopted Plan Bay Area 2040 goals and performance targets. This evaluation informed the development of the region's "preferred scenario," which incorporated some of the most promising aspects of the three scenarios. The transportation strategies included in the Preferred Scenario, which has subsequently become the Draft Plan, are articulated in this supplemental report.

For more detail on the inputs and assumptions underlying the scenarios evaluated for Plan Bay Area 2040, see the Scenario Planning Supplemental Report, which can be found here:

<http://2040.planbayarea.org/reports>

## Performance Assessment

As previously articulated, funding requests far exceeded the available flexible (or discretionary) funding over the next 24 years. To aid in prioritizing these scarce resources, staff conducted a project-level assessment of major uncommitted projects that either increase capacity or invest in bringing existing assets up to a state of good repair. This assessment included a measure of cost-effectiveness in the form of a benefit-cost ratio and a qualitative score for support of Plan Bay Area 2040 performance targets. Together, these two metrics identified high-, medium- and low- performing projects. The results of the assessment generally led to the following investment principles:

- Fund maintenance and rehabilitation of all infrastructure, which were among the highest performing investments
- Fund high-performing, major transit projects
- Fund highway mobility initiatives
- Fund transit efficiency and expansion projects in Priority Development Areas (PDAs)
- Complete funding plans for county priorities

For more information on project-level performance assessment, see the Performance Assessment Supplemental Report, which can be found here: <http://2040.planbayarea.org/reports>

## Transportation Investment Strategy

The investment strategy for Plan Bay Area 2040 is a blueprint for both short- and long-term transportation investments to support the Plan's focused growth strategy. Investment priorities for the next 24 years reflect a primary commitment to "Fix It First," a key emphasis area in the original Plan Bay Area as well. Approximately 90 percent of Plan Bay Area 2040's investments focus on operating, maintaining and modernizing the existing transportation system. Plan Bay Area 2040 also directs almost two-thirds of future funding to investments in public transit, mostly to ensure that transit operators can sustain existing service levels through 2040.

- **Operate and Maintain:** This strategy includes projects that replace transit assets, operate and maintain local streets and state highways, and operate the transit system.
- **Modernize:** This strategy includes projects that improve the existing system without significantly increasing the geographical extent of the infrastructure. Electrifying Caltrain and completing portions of the express lane network are two major investments in this category.
- **Expand:** This strategy includes projects that extend fixed-guideway rail service or add lanes to roadways. Extending Caltrain to downtown San Francisco and BART into Silicon Valley, as well as implementing express lanes on US-101 in San Mateo and Santa Clara counties, are major investments in this category.
- **Debt Service and Cost Contingency:** This includes on-going debt service and financing costs as well as a cost contingency for expansion projects.

**Table 3. Funding distribution for Plan Bay Area 2040.**

Investment Strategy	Local/Committed Funding (\$ Billions)	Regional Discretionary Funding (\$ Billions)	Plan Investment (\$ Billions)
<b>Operate + Maintain</b>			
Transit Capital Maintenance	\$11	\$21	\$32
Transit Operations	\$104	\$16	\$120
Local Streets and Roads Operations and Maintenance	\$28	\$8	\$35
Highways and Bridge Operations and Maintenance	\$30	<\$1	\$30
<b>Operate + Maintain Subtotal</b>	<b>\$172</b>	<b>\$46</b>	<b>\$218</b>
<b>Modernize</b>			
Transit Modernization and Efficiency	\$11	\$9	\$21
Roadway Performance and Goods Movement	\$12	\$5	\$17
Support Focused Growth	\$7	\$4	\$11
<b>Modernize Subtotal</b>	<b>\$30</b>	<b>\$19</b>	<b>\$49</b>
<b>Expand</b>			
Transit Expansion	\$15	\$6	\$21
Roadway Expansion	\$9	\$1	\$10
<b>Expand Subtotal</b>	<b>\$23</b>	<b>\$8</b>	<b>\$31</b>
<b>Debt Service, Financing, and Cost Contingency</b>	<b>\$3</b>	<b>\$2</b>	<b>\$5</b>
<b>Total</b>	<b>\$229</b>	<b>\$74</b>	<b>\$303</b>

*Values may not sum due to rounding*

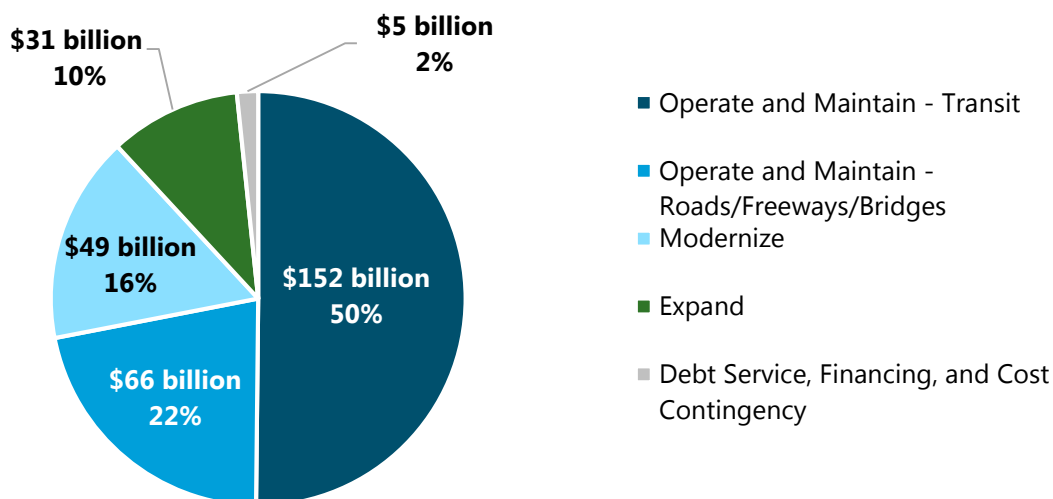


Figure 1. Plan Bay Area 2040 funding distribution.

The projects and programs included in Plan Bay Area 2040 are listed individually and mapped, where applicable, in the [Online Project Database](#).

## Operate and Maintain

Plan Bay Area 2040 directs a majority of funding to maintain existing transportation assets and to support the infrastructure of the existing transportation system.

### Transit Operations and Maintenance

Plan Bay Area 2040 fully funds the operation of existing transit services while also funding the majority of remaining high-priority transit capital needs. Almost 30 percent of discretionary funding is used to pay down the region’s transit maintenance backlog. Consistent with the region’s Transit Capital Priorities Policy, high-priority transit capital investments include replacing revenue vehicles (buses, railcars and ferries) – which are the Plan’s top priority for transit capital funds – as well as maintaining “fixed guideway” infrastructure (track, bridges, tunnels and power systems) and communications equipment to ensure the safe, reliable and timely delivery of transit service throughout the region.

Despite this investment, a remaining need of almost \$15 billion remains, most of which is needed to replace non-vehicle assets for BART and Muni, including station repairs like replacing elevators and escalators.

**Table 4. Funding distribution for transit operations and maintenance by operator.**

Transit Operator	Amount for Transit Operations (\$ Billions)*	Amount for Transit Capital Maintenance (\$ Billions)	Remaining Need for Capital Maintenance (\$ Billions)
SFMTA	\$35	\$7	\$5
BART	\$31	\$13	\$5
VTA	\$16	\$3	<\$1
AC Transit	\$13	\$2	\$1
Caltrain	\$5	\$3	\$1
SamTrans	\$5	<\$1	\$1
GGHTD	\$4	<\$1	\$1
Other Operators	\$10	\$3	\$1

Transit Operator	Amount for Transit Operations (\$ Billions)*	Amount for Transit Capital Maintenance (\$ Billions)	Remaining Need for Capital Maintenance (\$ Billions)
<b>Total</b>	<b>\$120</b>	<b>\$32</b>	<b>\$15</b>
<b>*Note:</b> existing transit operations are fully funded in the Plan period			

For more information on transit operations and maintenance costs, and more detail on the funding distribution by operator, see the Transit Operating and Capital Needs and Revenue Assessment supplemental report.

### Local Streets and Roads

The next largest regional discretionary investment is for the operation and maintenance of the Bay Area's local streets and roads (LSR). Between committed and future sources such as a potential regional gas tax, Plan Bay Area 2040 directs over \$35 billion for local streets and roads, which prioritizes operations expenses and costs to improve pavement conditions. This still leaves a gap of almost \$8 billion to maintain existing pavement as well as non-pavement assets like signals, storm drains and sidewalks, and a remaining need of \$14 billion to achieve a state of good repair for all local streets and roads assets. Consequently, the regional pavement condition index, a measure of the quality of pavement on a scale from 0 (failed) to 100 (brand-new), decreases from 66 in 2015 to 62 in 2040.

**Table 5. Funding distribution for operating and maintaining local streets and roads.**

County	Amount for LSR Operations and Maintenance (\$ Billions)*	Remaining Maintenance Need (\$ Billions)
Alameda	\$7	\$2
Contra Costa	\$4	\$2
Marin	\$1	\$1
Napa	\$1	<\$1
San Francisco	\$7	\$1
San Mateo	\$3	\$1
Santa Clara	\$9	\$2
Solano	\$1	\$2
Sonoma	\$2	\$3
<b>Total</b>	<b>\$35</b>	<b>\$14</b>
<b>*Note:</b> LSR operations are fully funded in the Plan period.		

For more information on maintenance costs and assumed funding distribution by county, see the Local Streets and Roads, Bridges, and State Highway Needs Assessment supplemental report.

### Highways and Bridges

Funding for maintenance on state highways and bridges is included in Plan Bay Area 2040 mostly as committed funding since MTC does not influence where this money is spent. Plan Bay Area 2040 assumes a two-dollar toll increase on all state-owned bridges, with \$1 added in 2019 and another \$1 added in 2024. Some of this future discretionary funding would be used for additional maintenance to the Bay Area's bridges.

For more information on maintenance costs and assumed funding distribution by county, see the Local Streets and Roads, Bridges and State Highway Needs Assessment supplemental report.

## Debt Service, Financing, and Cost Contingency

Included in cost projections for operating and maintaining the Bay Area's existing transportation system is a reserve for debt service, financing costs and future cost increases on modernization and expansion projects.

## Modernize

The Bay Area's transportation infrastructure, mostly built in the 20th century, will require significant upgrading to handle the travel volumes and travel needs of the 21st century. Modernization is critical to expand capacity on crowded BART lines, improve speeds on heavily used bus lines, add safe bicycle facilities on busy roads, install new technologies to smooth traffic flow, and redesign interchanges to handle greater traffic volumes.

### Transit Modernization and Efficiency

In addition to investments in transit capital maintenance, Plan Bay Area 2040 will replace transit infrastructure through modernization projects that support either additional or more reliable service. Two examples of this type of project are Caltrain Electrification and BART Transbay Core Capacity projects. These projects replace aging vehicles and control systems with new equipment that increases capacity and enables more frequent and reliable operations.

Additional projects in this investment strategy include projects that increase transit capacity in the core of the region by modernizing or expanding existing services. Examples include: bus rapid transit along Geary Boulevard in San Francisco; ferry service increases from Vallejo, Oakland and Alameda to downtown San Francisco; and AC Transit service increases, particularly in the Transbay routes.

**Table 6. Core capacity transit modernization investments.**

Project Description by Corridor	Investment (billions \$)
<b>Transbay Corridor</b> Investments include BART service increases; WETA ferry service increases; new ferry terminals at Berkeley, Mission Bay and Alameda Point; AC Transit service increases and Bay Bridge operational projects.	\$5.5
<b>Peninsula Corridor</b> Investments include the Transbay Transit Center, electrifying Caltrain, and station improvements along the Peninsula	\$3.1
<b>Within San Francisco</b> Investments include Muni service increases, bus rapid transit on Van Ness Avenue and Geary Boulevard, Muni Forward and other operational improvements for SFMTA.	\$2.7
<b>Planning for Future Capacity Improvements</b> Placeholder for future planning and design work for additional capacity-increasing projects identified through the Core Capacity Transit Study and other planning work.	\$0.5
<b>Core Connectivity in Santa Clara County</b> Investments include increasing VTA core bus routes, El Camino Real BRT and a reserve for future transit improvements in the SR-85 corridor	\$1.8

Project Description by Corridor	Investment (billions \$)
---------------------------------	-----------------------------

*Note – Core capacity projects that would extend rail by adding more stations are included in the “expand” investment strategy and not included here. These include extending Caltrain to the Transbay Transit Center, Phase 2 of the BART extension to Silicon Valley, and extending VTA light rail to Vasona Junction and along Capitol Expressway.*

This category also includes strategic investments in transit efficiency throughout the Bay Area, not just in the core. Projects in the North and East Bay yield significant benefits as a result of planned housing growth in PDAs and the growth of job centers. Investments in Santa Rosa CityBus would significantly increase service over today’s frequencies and implement priority bus corridors. San Pablo BRT, another cost-effective project in this category, would serve increasingly densifying corridors along San Pablo Avenue in the East Bay and provide a viable alternative to driving in one of the most congested highway corridors of the Bay Area.

### Roadway Performance and Goods Movement

The Bay Area consistently ranks as one of the most congested metropolitan areas in the nation. This investment category invests in high-technology, large-impact operational strategies to improve performance of the region’s freeway and goods movement networks. The objectives of these strategies are highlighted in three programs: express lanes, goods movement, and roadway efficiency projects.

#### Express Lanes

Express Lanes are a high-tech way to take advantage of available capacity in under-used carpool lanes and to improve traffic management and reliability on heavily-used carpool lanes. Express lanes are carpool lanes that allow for toll-free travel by carpools, buses, motorcycles and qualifying clean-air vehicles while also giving solo drivers the choice to pay a toll for a more reliable trip. Express lanes can either be implemented through converting existing carpool lanes or constructing new lanes, that close gaps in the region’s carpool lane network. The express lane projects in the Modernize category include the conversions, which also comprise the region’s near-term express lane priorities and are typically less costly than the projects that require adding a new lane. Table 7 presents these segments.

**Table 7. Modernization express lane projects.**

County	Express Lane Segment – Conversions	Capital Project Cost (\$ Millions)*	Anticipated Open Year
Contra Costa	I-680 Express Lanes in both directions: Livorna/Rudgear to Alcosta	\$56	2017
Santa Clara	SR 237 Express Lanes: North First St. to Mathilda Ave.	\$27	2018
Alameda	I-880 Express Lanes in both directions: Hegenberger/Lewelling to SR-237	\$78	2019
Alameda	I-680 Southbound Express Lanes (SR-237 to SR-84) Upgrades	\$39	2019
Solano	I-80 Express Lanes in both directions: Airbase Parkway to Red Top Road	\$44	2020
Contra Costa	I-680 Express Lanes: Southbound from Marina Vista to Rudgear	\$36	2020
Alameda	SR-84 Express Lanes: Westbound from I-880 to Dumbarton Bridge Toll Plaza	\$6	2020



County	Express Lane Segment – Conversions	Capital Project Cost (\$ Millions)*	Anticipated Open Year
Alameda	SR-92 Express Lanes: Westbound from Hesperian to San Mateo Bridge Toll Plaza	\$7	2020
Contra Costa	I-680 Express Lanes: Northbound from Marina Vista to SR 242	\$15	2021
Alameda	I-80 Express Lanes: Westbound Bay Bridge Approaches	\$18	2022
Alameda & Contra Costa	I-80 Express Lanes in both directions: Carquinez Bridge to Bay Bridge	\$81	2022
Santa Clara	Various: I-880 Express Lanes: SR-237 to US-101 SR-87 Express Lanes: I-880 to SR-85 I-680 Express Lanes: SR-237 to US-101 I-280 Express Lanes: US-101 to Magdalena Avenue	\$275	2023-2029

Sorted by anticipated open year  
Costs listed are for capital expenses only  
Does not include I-680 carpool lane conversions through the SR-24 interchange in Contra Costa County because these depend on a carpool lane gap closure, which is part of a separate project.

### Goods Movement

Following on the recommendations of the region's goods movement plans, the investment strategy includes projects that would increase sustainable global competitiveness of the Port of Oakland and the Oakland Airport, increase smart operations and deliveries, and modernize infrastructure on high-priority freight corridors. These strategies could be realized through a first-time inclusion of dedicated state and federal funding for freight in the regional transportation plan. The revenue forecast assumes the region will receive \$2.3 billion of federal funding and \$0.5 billion of state Cap-and-Trade funding for goods movement. Combined with local and committed funding, Plan Bay Area 2040 directs over \$5 billion to goods movement projects and to programs that work to reduce adverse effects of freight travel through neighborhoods.

**Table 8. Goods movement investments in Plan Bay Area 2040.**

Goods Movement Investment	Investment (billions \$)
<b>Global Competitiveness in Goods Movement</b>	
Suite of projects such as 7th Street Grade Separation, Outer Harbor Intermodal Terminal and Oakland Army Base transportation components to improve operations and increase rail access at the Port of Oakland	\$1.2
<b>Smart Deliveries and Operations</b>	
Future program for deploying communications infrastructure to increase active traffic management along freight corridors and to/from the Port of Oakland	\$0.3
<b>Modernizing Infrastructure</b>	
Highway projects and interchange improvements along freight corridors such as I-880, I-80, I-580, I-680, U.S. 101 and S.R. 4.	\$3.2

Goods Movement Investment	Investment (billions \$)
<b><i>Sustainable Goods Movement</i></b>	
Future program for implementing recommendations of the Freight Emission Reduction Action Plan and developing programs for impact reduction in neighborhoods with high levels of freight activity.	\$0.4
<b><i>Other Freight and Rail</i></b>	
Programs and projects for minor freight-movement improvements and rail operations on track operated by public operators.	\$0.3

### Roadway Efficiency Improvements

One of the most cost-effective methods for improving roadway performance is to use technology to actively manage traffic demand. When applied region-wide, initiatives like adaptive ramp meters and traffic signal upgrades yield benefits approximately 11 times greater than annual costs. Bay Area Forward<sup>1</sup> combines these types of investments with additional operational improvements, connected vehicle and shared-use mobility pilots and express bus investments. This suite of strategies is designed to improve the speed, reliability and person-throughput of roadways and transit services alike, and to prepare the Bay Area for further technological advancements in transportation. Among the near-term initiatives is *Bay Bridge Forward*, which will implement projects targeted at filling empty seats across the Bay Bridge corridor by encouraging carpooling and providing high-capacity transit.

These capacity improvements and technology investments rely on physical hardware and communications infrastructure that periodically must be replaced and upgraded. Transportation Management System projects aim to actively manage and enhance communications network systems, and to maintain and improve vital operational infrastructure used to monitor travel conditions and facilitate response to freeway incidents. Between projects in this category and investments in state highway operations and maintenance, Plan Bay Area 2040 directs significant funding to the development and maintenance of regional ITS architecture.

**Table 9. Roadway efficiency improvements in Plan Bay Area 2040.**

Program Elements	Description
<b>Freeway Efficiency Improvements</b>	Upgrades all existing ramp meters to adaptive, which dynamically manages on-ramp traffic. Adaptive meters have been shown to increase corridor throughput over traditional ramp metering. Installs hard shoulder running lane, contra-flow lane, queue warning, and modifies ramps
<b>Arterial Operations</b>	Improves arterial operations through implementation of traditional time-of-day signal timing coordination, adaptive traffic signal control systems, transit signal priority, real-time traffic monitoring devices, ped/bike detection, queue-jump lanes, etc.
<b>Connected and Automated Vehicle Program</b>	Implements pilot deployments of vehicle-to-infrastructure (V2I) strategies, strategic planning for system readiness, training for local agencies, public/private partnerships, and comments on state and national policy developments.

<sup>1</sup> When first evaluated for inclusion in Plan Bay Area 2040, this project was evaluated as the Columbus Day Initiative. The cost-effective technology upgrades in Columbus Day Initiative are now included in a more comprehensive, regional program known as Bay Area Forward.

Program Elements	Description
<b>Shared Mobility Pilot</b>	Develops a pilot program to support transit agencies and/or private transit providers in deploying transit solutions.
<b>Express Buses and Commuter Parking</b>	Provides pilot express bus service for routes not currently served by operators and expands park-and-ride facilities throughout the region.
<b>Intelligent Transportation Systems Infrastructure</b>	Replaces and rehabilitates the physical ramp meters, induction loops and cameras used to manage traffic real-time and to collect traffic data for planning purposes. Maintains and replaces telecommunication networks connecting all field devices with potential to transition from copper lines to fiber optics
<b>Incident Management</b>	Enhances first responders' capabilities to clear traffic incidents and respond to major emergencies through integrated corridor management

### Supporting Focused Growth and Reducing Greenhouse Gas Emissions

In addition to significant transit and roadway performance investments to encourage focused growth, Plan Bay Area 2040 directs funding to neighborhood active transportation and complete streets projects; climate initiatives to reduce greenhouse gas emissions; safety programs; PDA planning; and lifeline transportation and access initiatives for elderly, disabled and lower-income residents. These programs directly support major Plan Bay Area 2040 goals by assisting Priority Development Areas and Communities of Concern, emphasizing connections to high-quality transit, and reducing greenhouse gas emissions. Many of these programs are implemented through MTC's One Bay Area Grant (OBAG) program.

#### *Reducing Greenhouse Gas Emissions*

Transportation investments and development patterns in Plan Bay Area 2040 will not be sufficient on their own to reach the greenhouse gas (GHG) emissions reduction targets mandated for the Bay Area by state law. Approximately 8 percentage points of Plan Bay Area 2040's emissions reduction target for 2035 will be achieved through strategies that are part of MTC's Climate Initiatives Program. These include transportation demand management programs, alternative fuel/vehicle strategies and car sharing. Additionally, Plan Bay Area 2040 includes regional carpool incentives such as ride-matching applications along Express Lane corridors and county-sponsored climate programs that also will promote demand-management strategies and emission-reduction technology. Plan Bay Area 2040 directs \$526 million to the regional Climate Initiatives Program, \$56 million for incentivizing higher levels of carpooling and \$212 million for county-sponsored initiatives.

The types of projects and programs that would be funded through implementation of this category include:

- 1 Transportation demand management (TDM) strategies, car sharing, vanpool incentives, alternative fuel/vehicle initiatives, targeted transportation alternatives, trip caps and existing commuter benefits ordinances.
- 2 Regional carpool incentives such as private sector ride-matching applications that target use of express lane corridors as well as first/last mile solutions to transit.
- 3 County-sponsored climate programs such as additional TDM strategies and promotion of emission-reduction technology.

### Active Transportation

Neighborhood-scale projects and many of the region's bicycle and pedestrian infrastructure needs are first evaluated and prioritized at the county level. These include both on-street facilities and recreational trails like the California Coastal Trail and the Bay Trail. Plan Bay Area 2040 includes programmatic categories for funding these needs in programs such as Multimodal Streetscapes and Bicycle and Pedestrian programs for each county, amounting to over \$5 billion in funding for complete streets and active transportation projects over the next 24 years. Within these programs, counties have the flexibility to implement specific projects. Plan Bay Area 2040 also directs approximately \$200 million to completing the Bay Trail and \$10 million to continue planning for a bike path on the West Span of the San Francisco-Oakland Bay Bridge.

One key funding program for implementing active transportation projects is California's Active Transportation Program (ATP). In 2013, California created the Active Transportation Program (ATP), which combines various fund sources into a single cohesive program for bicycle and pedestrian projects. The Bay Area to date has adopted three cycles of ATP funding. In each cycle, the region has requested far more money than has been available. In the latest cycle, adopted in early 2017, Bay Area cities and counties submitted more than \$165 million in project requests for ATP funds — or 7.5 times the \$22 million available.

The following table lists the region's ATP projects for FY 2019-2020 and FY 2020-2021, totaling \$54 million. These projects constitute the region's near-term active transportation priorities, and focus on improving bicycle and pedestrian facilities in Communities of Concern, funding the region's Safe Routes to School Program, Bay Trail and Regional Bike Network build-out, and multi-jurisdictional projects.

**Table 10. Bay Area's ATP projects for FY 2019-2020 and FY 2020-2021.**

Location	Title	Cost (\$million)
Oakland	14th Street: Safe Routes in the City	\$11
Alameda	Central Avenue Complete Street Project	\$7
Oakland	Fruitvale Alive Gap Closure Project	\$6
Sunnyvale	Sunnyvale SNAIL Neighborhood Active Transportation Connectivity Improvements	\$5
San Rafael	Francisco Blvd East Avenue Bridge Bike Ped Connectivity	\$4
San Francisco	Powell Street Safety Project	\$4
Vallejo	Bay Trail/Vine Trail Gap Closure	\$4
Region-wide	Various projects including Safe Routes to School improvements, sidewalk gap closures, and trail completions	\$13

*Note – only lists projects that are at least \$4 million, rounded to the nearest million*

### Access Initiatives

Plan Bay Area 2040 directs \$800 million to the Lifeline Transportation Program, which will fund priority projects identified by residents in MTC's Communities of Concern. The Lifeline Program implements locally crafted Community-Based Transportation Plans, which MTC also funds, and can include community shuttles, transit services, and transit station/bus stop amenities. Additionally, Plan Bay Area 2040 directs \$90 million for a future mobility management program. Through partnerships with transportation service providers, mobility management enables communities to monitor transportation

needs and to link individuals to appropriate, cost-efficient travel options. This strategy is key to the region's ability to address the growth in its populations of seniors and people with disabilities.

County programs will contribute \$300 million to similar initiatives such as an affordable-fare program in San Francisco, a low-income school bus program in Contra Costa County, and expanding late-night transportation operations for workers traveling from San Francisco. Counties will invest another \$700 million in expanding paratransit services that directly benefit people with disabilities, many of whom also are seniors.

## Airports

The San Francisco Bay Area has invested significant amounts of funding over the past two decades to improve access to the region's airports – first with the extension of BART to San Francisco International Airport and the nearby Millbrae Caltrain station in 2003, and then again in 2014 with the construction of the Oakland Airport Connector to provide a congestion-free ride between Coliseum BART and Oakland International Airport. Plan Bay Area 2040 includes funding to study access improvements to the region's third-busiest airport – Mineta San Jose International. The study would analyze a proposed Automated People Mover connecting the airport to nearby Caltrain and light rail lines. Such a project would also connect to BART to Silicon Valley (Phase 2), a funded project in Plan Bay Area 2040. Going beyond access improvements, the Plan also includes perimeter dikes at Oakland International Airport to protect runways from flooding and future adverse impacts of sea level rise. After completion, the perimeter dike will be able to withstand severe storms and seismic events.

## Expand

The remaining 10 percent of funding is directed toward a set of transit extensions and roadway expansions. Examples include the BART extension to San Jose and Santa Clara, and the Caltrain Downtown San Francisco Extension, which will provide new rail links to the hearts of the Bay Area's two largest cities. These projects are top regional priorities for federal [New Starts](#) funding over the next five years. This category also includes VTA's next set of light rail extensions planned for the Capitol Expressway and Vasona lines, and for SMART extensions to Larkspur and Windsor. The largest transit expansion project in this category is the Bay Area segment of California High-Speed Rail, with a price tag of over \$8 billion for the Bay Area, with funding largely provided by the High Speed Rail Authority.

Also in this category are select roadway expansions along highways and arterials throughout the region. The largest of these is the addition of new managed lanes (HOV and/or HOT) along U.S. 101 from Brisbane to Morgan Hill in the South Bay. Compared to the express lane segments that convert an existing carpool lane, the projects requiring a new lane are typically more expensive and would be implemented on a medium-term schedule (e.g. after 2020). Table 11 lists the expansion highway projects in Plan Bay Area 2040.

**Table 11. Major highway expansion projects.**

County	Project	Capital Project Cost (\$ Millions)	Anticipated Open Year
Contra Costa	I-680 Northbound HOV lane extension between N. Main and SR-242	\$54	2020
Solano	I-80 Express Lanes in both directions: Airbase Parkway to I-505	\$136	2020

County	Project	Capital Project Cost (\$ Millions)	Anticipated Open Year
San Mateo	U.S. 101 Managed Lane: I-380 to Whipple Ave.	\$365	2020
Contra Costa	I-680 Express Lanes: Northbound from Rudgear to SR 242	\$57	2021
Alameda	I-680 Express Lanes: Northbound from SR-84 to SR-237	\$394	2023
San Mateo	U.S. 101 Managed Lane: I-380 to San Francisco County line	\$222	2024
Alameda	I-880 Express Lanes: Northbound from Hegenberger to Lewelling and bridge improvements	\$221	2025
Solano	I-680 Express Lanes: I-80 westbound to I-680 southbound and I-680 northbound to I-80 eastbound direct connectors	\$140	2025
Santa Clara	SR 85 Express Lanes: US 101 (South San Jose) to Mountain View	\$198	2025
Marin + Sonoma	Implement Marin-Sonoma Narrows Phase 2	\$389	2025
Santa Clara	US 101 Express Lanes: Whipple Ave. in San Mateo County to Cochrane Road in Morgan Hill	\$507	2025
Contra Costa	I-680 Northbound Managed Lane Completion through 680/24	\$99	2026
Santa Clara	I-280 New HOV Lane from San Mateo County line to Magdalena Avenue	\$60	2029
Sorted by anticipated open year			
Costs include capital expenses only			

## Regional Transit Funding Priorities

To implement the transit priorities of the investment strategy, the region periodically adopts priorities for particular funding sources. Transit projects totaling hundreds of millions or even billions of dollars generally require funding from multiple sources, including state and federal sources, and often rely on complex agreements among funding partners. Fierce competition for state and federal discretionary funds requires a unified set of regional priorities to successfully compete for these dollars.

The establishment of regional transit priorities started with the Regional Transit Expansion Program (Resolution 3434) in 2001. The resolution identified \$18 billion of transit expansion priorities for the following 25 years. As of 2017, most of these projects — including Phase 1 of the Transbay Transit Center, BART extensions to Warm Springs and Berryessa, the eBART extension in eastern Contra Costa County, BART/Oakland Airport Connector, Sonoma-Marin Rail Initial Operating Segment and SFMTA's Central Subway — either are in service or under construction. The remaining large investments have been reconfirmed as priorities for future funding or are included in Plan Bay Area 2040 for early phases of work as development of the projects continues.

A large component of Resolution 3434 is the federal competitive program for transit expansion called New Starts and Small Starts, or Section 5309. Resolution 3434 created a regional strategy to secure funds from this highly competitive national funding source. The Bay Area in 2012 secured commitments for nearly \$2 billion in New Starts funding for San Francisco's Central Subway and the extension of BART to Berryessa in East San Jose.

Since the last Plan Bay Area, FTA has enabled modernization projects that increase capacity, like vehicle replacements and train control upgrades, to compete with traditional expansion projects for the New and Small Starts Program. In response, regional and local partners in 2013 created the [Core Capacity Challenge Grant Program](#), which identified \$7.5 billion in funding for the region's four largest operators — BART, Muni, AC Transit, and VTA — to finance vehicle replacement, fleet expansion and upgrades to key facilities.

Building on the successful progress of Resolution 3434, the results of the Performance Assessment, and the recently adopted Core Capacity Challenge Grant program, Plan Bay Area 2040's regional transit priorities for Section 5309 funding include finishing important extensions of BART to San Jose and Caltrain to the new Transbay Transit Center in San Francisco, as well as the modernization of both systems. Other priorities include funding for bus rapid transit along Geary Boulevard in San Francisco and upgrading Market Street in San Francisco both for transit vehicles and for bicyclists and pedestrians.

Along with identifying these high-performing future transit investments, Plan Bay Area 2040 retains \$640 million in future New and Small Starts funding for projects to enhance transit service in the East Bay and North Bay counties. All future priorities are subject to an assessment of feasible alternatives, an evaluation for cost-effectiveness and for performance against MTC's Transit-Oriented Development Policy.

**Table 12. Priorities for New Starts/Small Starts/Core Capacity funding programs.**

Project	Capital Cost	Funding Plan			
		Committed	New Starts/ Small Starts/ Core Capacity	Cap and Trade	Future Regional/ Other
<b>BART to Silicon Valley – Phase 2</b>	\$5,175	\$2,925	\$1,500	\$750	--
<b>Transbay Transit Center, Phase 2 – Downtown Extension</b>	\$3,999	\$1,167	\$1,000	--	\$1,832
<b>Caltrain Electrification – Phase 1</b>	\$2,211	\$1,431	\$647	\$20	\$113
<b>BART Transbay Core Capacity Project<sup>1</sup></b>	\$3,132	\$1,332	\$900	\$450	\$450
<b>AC Transit – San Pablo BRT</b>	\$300	\$25	\$75	--	\$200
<b>VTA – El Camino Real BRT</b>	\$267	\$192	\$75	--	--
<b>SFMTA – Geary Boulevard BRT<sup>2</sup></b>	\$300	\$57	\$100	\$100	\$43
<b>SFMTA – Better Market Street</b>	\$415	\$215	\$65	\$110	\$25
<b>Section 5309 Project Reserve<sup>3</sup></b>	n/a	--	\$640	--	--

(values in millions of year-of-expenditure dollars)

Notes

1. Cost does not include \$287 million in contingency/financing, which is included in RTPID 17-10-0016 "Cost Contingency and Financing."
2. \$174M in committed O&M and \$33M in committed vehicles is not listed.
3. Section 5309 funding reserve for North and East Bay projects. Of the Plan Bay Area (2013) amount, \$20 million has already been allocated to the SMART Larkspur extension.



Both the Core Capacity Challenge Grant and the region’s New Starts priorities rely on steady commitments from future Cap-and-Trade funding from the state. The Cap-and-Trade program reduces pollution by imposing limits on emissions, which become more stringent each year. Major emitters must buy an allowance for every ton of carbon dioxide they release into the air and state law requires that this money be spent on projects that reduce greenhouse gas emissions.

Transit capacity projects play a large part in the [framework](#) MTC adopted for requesting Cap-and-Trade funding. Table 10 presents the full set of regional transit capital priorities for Cap-and-Trade program funding.

**Table 13. Cap and Trade framework for transit capital projects.**

Operator/Types of Projects	Amount (\$ Millions)
BART Transbay Core Capacity Project – fleet expansion, train control and Hayward Maintenance Facility	\$500
SFMTA – fleet expansion, facilities, core capacity/BRT projects	\$785
AC Transit - fleet expansion, facilities, major corridors	\$340
VTA – BART to San Jose	\$750
Caltrain – Electrification and EMU expansion	\$225
Multiple Operators – expansion and modernization projects in high-ridership bus, ferry and light rail corridors	\$400

## Projects on the Horizon

Although the investment strategy includes over \$300 billion in funding, this still is not enough to meet the region’s expansion and modernization needs. One way for project sponsors to continue working on projects that fall outside of the revenue envelope is to include only the comparatively low-cost early phases (e.g. conceptual planning, environmental impact analyses, right-of-way acquisition and preliminary design) of the project in the Plan. If these projects are to move forward, construction funding would need to be identified.

**Table 14. Pre-construction projects in Plan Bay Area 2040.**

Project Included through Planning, Environmental and/or Design Phases
Transit
BART to Livermore/ACE Project
SMART Extension from Windsor to Cloverdale
Southeast San Francisco Caltrain Station
Geneva Light Rail – San Francisco
Redwood City Ferry Terminal and Service
Redwood City Street Car



Project Included through Planning, Environmental and/or Design Phases
Mineta San Jose International Airport Automated People Mover Connector
Bay Bridge Contraflow Lane
Larkspur Ferry Terminal Parking Garage
Broadway Shuttle Expansion - Oakland
Highway
Improve local access at I-280/I-380 from Sneath Lane to San Bruno Avenue to I-380
U.S. 101/Candlestick Interchange
SR-239 Feasibility Studies
Westbound slow vehicle lane on State Route 92 from I-280 to State Route 35
Construct a six-lane arterial from Geneva Avenue/Bayshore Boulevard intersection to U.S. 101/Candlestick Point interchange
State Route 152 New Alignment
East and North Bay Express Lanes – Future Segments
Santa Clara County Express Lanes – Future Segments
State Route 37 Improvements and Sea Level Rise Mitigation
U.S. 101/I-580 Interchange Direct Connector
U.S. 101 Tiburon East Blithedale Interchange
Sir Francis Drake Boulevard/Red Hill Avenue/Center Boulevard (known as "The Hub") – Marin County
Bike/Ped
San Francisco-Oakland Bay Bridge West Span Bicycle, Pedestrian and Maintenance Path