

# BART

## System Renewal Program Plan | 2016

**DRAFT**

BUILDING A BETTER BART



# ACKNOWLEDGEMENTS

BART System Renewal Program Plan | 2016

**BART BOARD OF DIRECTORS**

**ELECTED OFFICIALS**

**COMMUNITY STAKEHOLDERS**

**BART STAFF**

**CONSULTANT STAFF**

*Nelson\Nygaard Consulting*

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# CONTENTS

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<b>Letter From the General Manager and Board of Directors</b>	<b>1</b>
<b>Introduction</b>	<b>4</b>
<b>Program Summary</b>	<b>6</b>
<b>Program Development</b>	<b>8</b>
<b>Program Investments</b>	<b>10</b>
Repair and replace critical safety infrastructure	10
Relieve crowding, increase system redundancy, and reduce traffic congestion	15
Improve station access and safety	18
<b>Benefits of the Plan</b>	<b>20</b>
<b>Organizational Structure</b>	<b>24</b>
<b>Implementing Guidelines</b>	<b>26</b>



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## LETTER FROM THE GENERAL MANAGER

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Dear Bay Area Residents,

BART has served the Bay Area for 44 years, delivering efficient transportation that supports the region's economy, reduces traffic, and protects the environment. BART's around-the-clock preventative maintenance practices have sustained the system's original infrastructure far longer than expected, but even well-maintained infrastructure eventually reaches the end of its useful life and must be renewed. For the BART system, the time has finally come for a major overhaul.

In consultation with stakeholders from across the region in more than 200 meetings, BART has developed a program of investments that will take a major step towards renewing the BART system. This detailed plan will repair and upgrade critical infrastructure, including tracks, power systems, tunnels, and mechanical systems. It will add capacity to the core of the system in order to continue to support the region's growing economy and reduce traffic. Finally, it will improve safety and access to the BART system, renewing stations, improving accessibility of stations for seniors and people with disabilities, and adding new station access opportunities.

This plan benefits both those who ride the BART system and those who travel on other modes. Through these investments, the plan will support the region in the following ways:



- **Improve safety:** BART has no higher responsibility than to keep its riders safe. This program will help to preserve BART's safety record, enhance earthquake preparedness, and maintain the region's confidence in the system.



- **Improve reliability:** Bay Area travelers depend on reliable BART service to connect them to work, school, airports, sporting events, the arts, shopping, family, and friends. Renewing the system's critical infrastructure will keep BART trains in service and running on time. Modeling suggests the program plan will result in 40% fewer delays caused by mechanical issues than occur today, a savings of 250 hours of delay each year.



- **Relieve crowding and reduce Bay Area traffic congestion:** Over BART's 44-year history, system ridership has grown with the regional economy, relieving pressure on the region's crowded highways and supporting the emergence of thriving regional employment centers. Today, however, BART ridership is at or above the system's maximum capacity in its busiest segments. Investments to increase BART's capacity will relieve crowding and allow BART to take more cars off our crowded roads in continued support of the region's growth.

The plan includes strict accountability measures to ensure that funds are spent only on approved projects. It requires annual independent audits, an independent oversight committee made up of people who live in the BART district, and annual compliance reports distributed to the public that detail costs and how specific performance measures are met. This Plan will help to Build a Better BART for the Bay Area's Future.

Sincerely,

Grace Crunican, General Manager / Cosigned: BART Board Members



# Introduction

## BART is Critical to the Bay Area

Since its opening in 1972, BART has become essential to the mobility, economy and livability of the Bay Area, for riders and non-riders alike. A functioning BART system is essential to the health of our region—connecting workers and businesses, and relieving regional traffic congestion. BART provides access to many of the region’s most important destinations for work, school, and recreation and accommodates people of all income levels as well as youth, seniors, and people with disabilities. By reducing the need to drive, BART reduces emissions and air pollution, supporting a healthier environment.

BART currently carries 440,000 passengers on a typical weekday. During peak periods, BART carries more people from the East Bay to San Francisco than are carried on the Bay Bridge. On the yellow Pittsburg Bay Point line, BART carries nearly as many peak hour riders as are carried through the Caldecott tunnel. BART is an essential part of our regional infrastructure, and demand for BART service is growing. Forecasts suggest that demand for BART will increase as the region grows, with 600,000 daily riders projected to use BART by 2040.

## BART Faces Major Challenges

After 44 years of service to the region, BART faces major challenges.

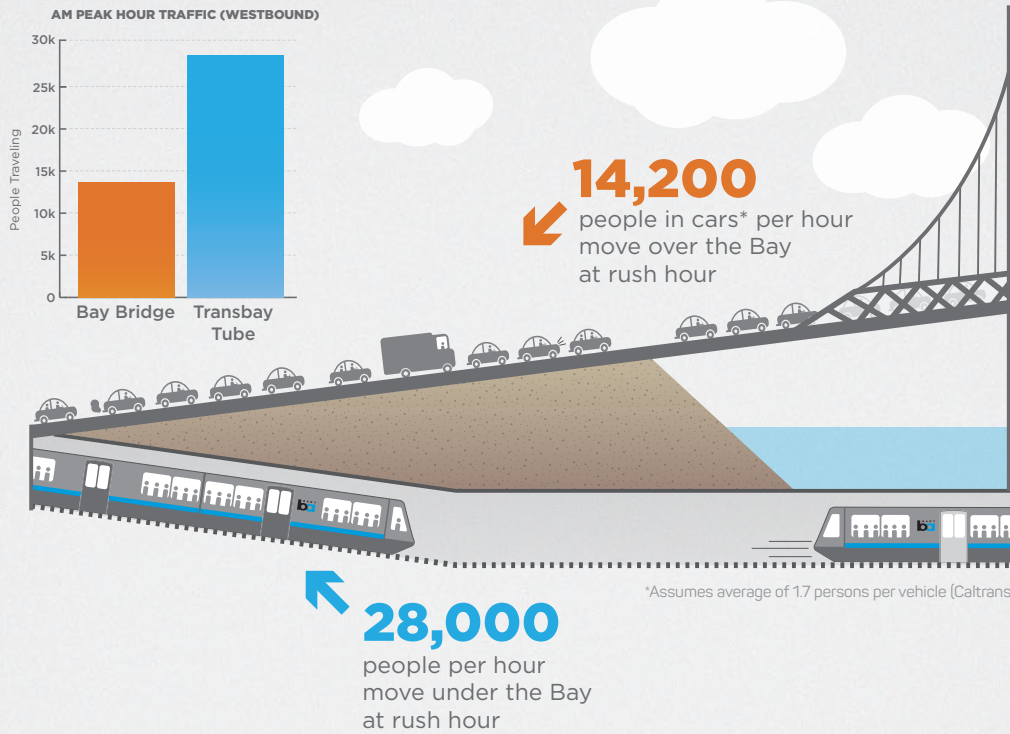
- As the economy has grown and more people have chosen to ride BART, the system has grown increasingly crowded during peak commute hours. To meet the demand, BART must invest to provide more service in the highest-demand times and places.
- At the same time, important parts of the infrastructure that make up the BART system were installed in the early 1970’s and require replacement or major overhauls.
- Finally, BART must consider its stations and how an influx of additional riders will access BART stations.

Without action to address BART’s aging infrastructure and crowded conditions, BART’s ability to perform its important role in the region will suffer: delays will increase, crowding will grow more acute, and the risk of unsafe conditions will rise. These consequences would affect not only BART riders, but everyone who lives in the area served by BART. Without a reliable BART system, the region would face worsening traffic congestion which would also reduce economic competitiveness.

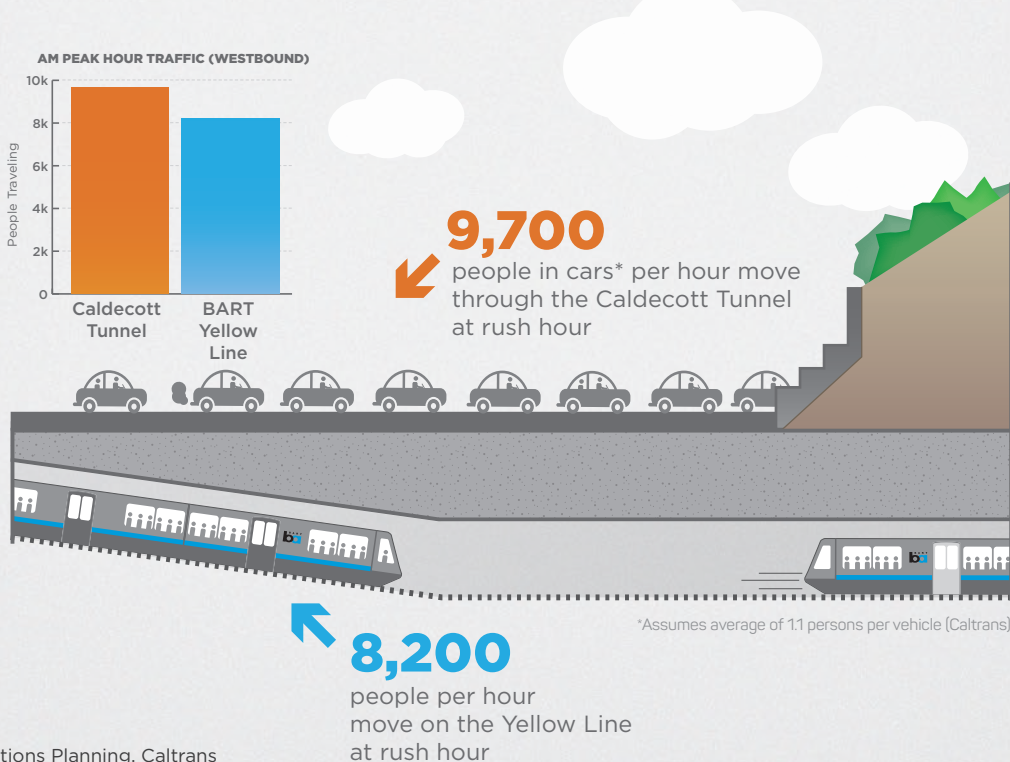
Funding from currently available sources is not sufficient to meet these growing needs. BART must seek new funding sources to continue to serve its important role in the region. This program plan is designed to address these challenges.



# BART's Transbay Tube Riders vs. Bay Bridge Drivers



# BART's Yellow Line Riders vs. Caldecott Tunnel Drivers



Source: BART Operations Planning, Caltrans

# Program Summary

The 2016 BART System Renewal Program (referred to throughout this document as the Program) responds to the San Francisco Bay Area's transportation needs by investing in the renewal of the BART system. In consultation with stakeholders from across the region in more than 200 meetings, BART has developed a program of investments that will:



- **Repair and replace critical safety infrastructure:** BART will renew the basic infrastructure that comprises the core of the BART system, including tracks, power infrastructure, tunnels, and mechanical infrastructure. BART will also perform critical earthquake safety upgrades to the Berkeley Hills Tunnel. After 44 years of service, this infrastructure requires a major overhaul to allow BART to continue to meet performance expectations.






- **Relieve crowding, increase system redundancy, and reduce traffic congestion:** BART will implement a package of projects that will allow it to meet soaring demand, continue to support the region's growing economy, and get more cars off the road. Projects include modernizing and upgrading major portions of the aging train control system, upgrading power infrastructure that limit BART's ability to provide service, and expanding maintenance facilities to store and service a larger fleet of rail cars.



- **Improve station access and safety:** BART will invest in improving and modernizing stations by improving station safety and security, adding elevators, and overhauling escalators to ensure fast and convenient access to platforms. BART will also make investments to improve accessibility of stations for people with disabilities and add more station access opportunities via upgraded bus facilities, bicycle facilities, and parking.



## Summary of Investments

	\$ Millions	% of Total Bond	Benefits		
			 Safety	 Reliability	 Crowding Relief
<b>REPAIR AND REPLACE CRITICAL SAFETY INFRASTRUCTURE</b>	<b>\$2,555</b>	<b>73%</b>	✓	✓	
Renew track	\$625	18%	✓	✓	
Renew power infrastructure	\$1,225	35%	✓	✓	
Repair tunnels and structures	\$570	16%	✓	✓	
Renew mechanical infrastructure	\$135	4%	✓	✓	
<b>RELIEVE CROWDING, INCREASE SYSTEM REDUNDANCY, AND REDUCE TRAFFIC CONGESTION</b>	<b>\$610</b>	<b>18%</b>	✓	✓	✓
Upgrade train control and other major system infrastructure to increase peak period capacity	\$400	12%	✓	✓	✓
Design and engineer future projects to relieve crowding, increase system redundancy, and reduce traffic congestion	\$0-\$210*	6%		✓	✓
<b>IMPROVE STATION ACCESS AND SAFETY</b>	<b>\$310</b>	<b>9%</b>	✓	✓	✓
Renew stations	\$210	6%	✓	✓	✓
Expand opportunities to safely access stations	\$0-\$100*	3%		✓	✓
<b>TOTAL</b>	<b>\$3,475</b>	<b>100%</b>			

\* Percentages are based on the high end of the range.

*Note on Governance:* Governance measures will include an independent oversight committee, spending restrictions, and annual audits. Funding cannot be taken away by the state.

*Note on Planned Expenditures:* Spending in each of the three major investment categories is fixed, however planned spending on the individual line items listed above are estimates. Actual spending in each line item may vary by up to 15% of the total for the corresponding major category, as BART tailors investments to respond to system needs as they arise.

# Program Development



## **BART is a responsible steward of bond funds**

Bay Area voters last approved a bond measure for BART in 2004 to fund BART's Earthquake Safety Program. Funds from that bond have been invested

in maintaining the safety of the BART system, including its elevated structures, stations, maintenance facilities, and other buildings. The program has upgraded critical elements of BART infrastructure to current seismic design standards to support the safety of BART riders and BART employees. The Earthquake Safety Program has also achieved \$350 million in construction savings that BART was able to reinvest in the program to further strengthen the system.

To date, 58% of bond funds have been expended, and the program has completed 91% of planned station upgrades, 95% of planned elevated structure upgrades, and 100% of planned upgrades to parking garages, maintenance facilities, and other infrastructure. The majority of the remaining resources will be dedicated to planned work on the Transbay Tube, which is ongoing. Independent oversight and annual audits have proceeded as planned. While the Earthquake Safety Program is achieving its objectives, additional earthquake safety investment is required to address seismic safety needs that have been identified since the program began.

An economic analysis of the 2004 Earthquake Safety Program shows that the program has not only improved safety but also helped to grow the region's economy. The investment of \$1.27 billion over 18 years (2004-2022) is projected to yield approximately \$2.2 billion in total economic activity and create nearly 13,000 direct and indirect jobs.



## Projects are carefully selected and prioritized

BART uses a Strategic Asset Management Program (AMP) to guide decisions about system reinvestment, minimize risk, and maintain financial stability. The AMP relies on detailed, ongoing data collection about each asset in the system, and follows international best practices to assess the likelihood of near-term failure for each asset and understand the impact that such a failure would have on the BART system, its riders, and the region.

The AMP was used to select the investments included in the program. It will also be used on an ongoing basis to guide decisions about the appropriate timing of the projects funded by this program. The process will guide annual prioritization of investments.



## This plan was developed with broad public participation

This program plan was developed with extensive public involvement through the 'Better BART' Initiative. BART has held more than 200 meetings with diverse stakeholder groups throughout the Bay Area, including elected officials, businesses, labor groups, environmental organizations, users of all modes of transportation, senior and disability advocacy groups, community based organizations, social justice advocates, and many others. These meetings have been designed to educate the Bay Area public about BART's 44-year-old system and the critical infrastructure investments needed to keep the system safe and reliable, and to get feedback on participants' needs and priorities. BART has distributed survey questionnaires to all meeting attendees and received over 1,500 responses to date.



# Program of Investments

This program includes three categories of investment, which together are designed to keep BART safe and reliable. Each investment category is described in detail below, including the types of infrastructure projects it includes. Specific individual projects will be selected for funding through a detailed process of risk assessment as documented in BART’s Strategic Asset Management Plan. More information on project selection and implementation process can be found in the Implementing Guidelines section of this document.



## Repair and replace critical safety infrastructure

BART was the first modern rapid transit system in the US: construction began in 1968 and the system has been in operation since 1972. To ensure responsible stewardship of public funds, BART staff has dedicated themselves to strategic maintenance, which has allowed some system infrastructure to last far longer than expected. However, even “best in the business” maintenance cannot keep obsolete infrastructure functioning forever.

The core of the program is a major investment to refurbish and replace BART’s most critical infrastructure. There are thousands of infrastructure elements in the BART system, and most are largely invisible to passengers, but they are fundamental to BART’s daily operation and the experience of every passenger depends on them.

### Addresses Goals



SAFETY



RELIABILITY

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**73%**

of Program

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**\$2,555**

Million

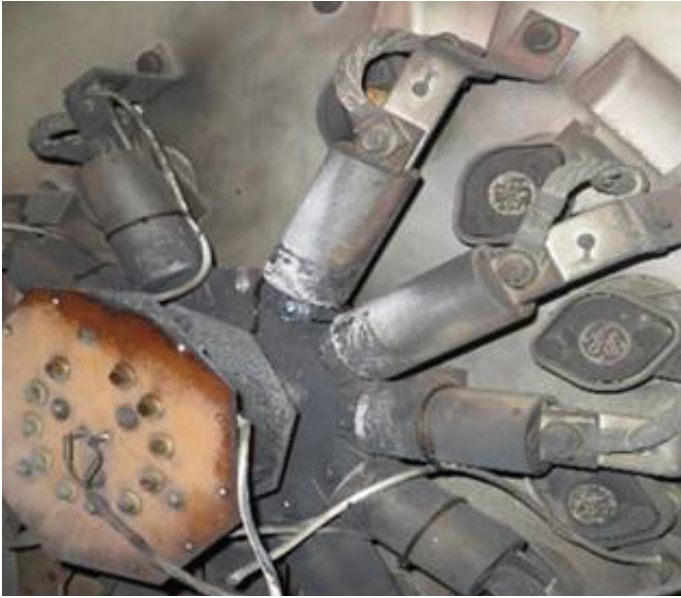
## RENEW TRACK

**Estimated at 18% of Program; \$625 M**

BART tracks are worn down from 44 years of use and require major repairs. BART is already working aggressively to address issues with tracks and structures with currently available funding. For example, during summer 2015, BART undertook a major effort to renew the tracks and structures west of the West Oakland Station. However, to maintain system performance for the long term and reduce the risk of major failures, additional funds are needed to refurbish and replace track infrastructure. Examples of projects in this category include:

- **Replace 90 miles of rails:** BART crews will replace 90 miles of original rails that have been worn down from 44 years of use. They will replace hundreds of original rail ties supporting those rails.
- **Rebuild major interlockings:** Interlockings allow BART trains to cross from one set of tracks to another safely. This infrastructure must be rebuilt to allow BART to continue to operate safely and at normal speeds.
- **Replace critical supporting track infrastructure:** Critical infrastructure that supports BART's rails is more than 40 years old and must be replaced for both reliability and safety reasons. For example, the steel fasteners that connect BART's rails to the concrete trackways below require replacement. The program will fund replacement of this critical infrastructure. BART forecasts that the planned investments will result in fewer track-related delays, improving service on a daily basis as well as substantially reducing the risk of major failure that could affect passenger safety.





## RENEW POWER INFRASTRUCTURE

Estimated at 35% of Program, \$1,225 M

BART trains run on 100% electric power. The infrastructure that distributes electricity throughout the system and delivers power to trains is aging and in need of major refurbishment. This program will fund refurbishment and replacement of BART's power infrastructure to maintain and improve service reliability. This investment category will fund the following types of projects:

- **Replace original power distribution infrastructure.** A network of power cables distributes electricity throughout the BART system. Many of these cables are original to the system and are at growing risk of failure. In addition, key locations in the system lack redundancy; failure at any of these locations will result in long-term delays in BART service and extended periods of increased regional traffic congestion. This program funds repair and replacement of approximately 90 miles of original power distribution infrastructure.

- **Refurbish and replace electrical substations.** BART has 62 substations that convert electricity to the proper voltage and deliver it to the third rail to power trains. Many of these substations are original to the system and require constant attention to keep them operational and safe. This program funds replacement of high-priority electrical substations to maintain and improve service reliability.

- **Replace and upgrade backup power supplies.** Safe, reliable train operations require an uninterrupted supply of power at BART facilities. The program will allow BART to replace the aging emergency generator at its central operations control center, and the backup power supplies that ensure continuous power to train control equipment, communication equipment, and emergency lighting at multiple BART stations.

Renewed power infrastructure will make service more reliable and more resilient. These investments will significantly reduce the risk of severe BART service disruptions that could impact regional traffic for an extended period of time.



## REPAIR TUNNELS AND STRUCTURES

**Estimated at 16% of Program, \$570 M**

BART tracks are supported by a range of structures and tunnels to provide service throughout the region. Like much of the system's infrastructure, these tunnels and support structures have been in use for decades and some are in need of major rehabilitation. Repairing damage to key structures will support continued passenger safety and reliable BART operations. This investment category will fund the following types of projects:

- **Repair damage from water intrusion in the Market Street tunnels.** BART's aging Market Street tunnels have suffered significant damage as a result of water intrusion. Over time, water leaks damage the tunnel walls as well as the rails inside, increasing the risk of both service delays and potential safety problems. For example, in May 2015 track damage due to water intrusion caused a track failure near Civic Center Station that delayed BART service for several hours, severely impacting regional traffic congestion. This program funds repairs to water intrusion in the tunnels, reducing the risk of major safety problems and improving service reliability.
- **Repair damage from water intrusion in stations.** Water intrusion has also damaged structures at BART stations, including platforms and trackways. This program will fund repair to structures at 16 stations.
- **Repair Hayward Fault Creep within the Berkeley Hills Tunnel.** The continuous movement of the Hayward Fault near the western edge of the Berkeley Hills Tunnel has caused the tunnel to shift from its original position. BART must realign the tunnel



for safety reasons. This realignment will involve modifications to the concrete interior and walkway inside the tunnel.

## RENEW MECHANICAL INFRASTRUCTURE

Estimated at 4% of Program, \$135 M

BART service relies on critical mechanical infrastructure, including fire suppression systems, tunnel emergency ventilation systems, heating, ventilation and air conditioning systems, water pumps, train repair shop components, generators, fueling facilities, and others. Most of these systems are over 40 years old. While invisible to passengers, they are vital to keeping trains running normally. This program will fund renewal of this mechanical infrastructure to ensure safety and reliability. This investment category will fund the following types of projects:

- **Refurbish and replace fire safety systems.** A network of pumps and sprinklers throughout the BART system helps keep people safe and protects important equipment from fire damage. This infrastructure is aging and must be replaced. The program will fund replacement of sprinklers as well as the complex fire suppression infrastructure that protects train control rooms.

- **Refurbish and replace water management infrastructure.** BART's water management infrastructure prevents flooding of important facilities, including the Transbay Tube, and allows the system to comply with environmental regulations. Excessive flooding can result in closed stations or trackways. The program will allow BART to refurbish and repair water infrastructure that is aging and at risk of failure, protecting critical infrastructure and maintaining the safety and reliability of the train system under all conditions.
- **Refurbish and replace repair shop infrastructure.** BART's repair shops have specialized mechanical infrastructure that is necessary to keep trains running. The program will allow BART to refurbish and replace this aging infrastructure, improving the efficiency of maintenance work and keeping more rail cars on the tracks.

Repairing mechanical infrastructure will reduce risks to passenger safety, improve service reliability, and help to minimize future maintenance costs.





## Relieve crowding, increase system redundancy, and reduce traffic congestion

Over the last decade, daily ridership on BART has increased 36%, closely tracking growth in regional employment. Growing ridership has already begun to place extraordinary demands on the BART system. Today, trains between Oakland and San Francisco exceed BART's standards for crowding during commute hours. Responding to this trend, BART has used all available resources to relieve crowding, including keeping 89% of its rail fleet in service at all times and adjusting schedules to provide service when and where it is needed most.

However, as the economy continues to expand, growth in demand for BART service will soon outpace the system's resources. To meet growing demand, BART must be able to provide more service at the highest-demand times and places. These crowding relief elements of this program will allow the BART system to accommodate regional growth and provide an alternative to increased driving on the region's already crowded roads.

### Addresses Goals



SAFETY



RELIABILITY



CROWDING RELIEF

**18%**  
of Program

**\$610**  
Million

## UPGRADE TRAIN CONTROL AND OTHER MAJOR SYSTEM INFRASTRUCTURE TO INCREASE PEAK PERIOD CAPACITY

Estimated at 12% of Program, \$400 M

To meet growing demand, BART must increase train service at the highest-demand times and places. However, several important elements of the BART system, including the train control system, rail car storage and maintenance facilities, and power systems, are already operating at capacity. The program will allow BART to upgrade this infrastructure enough to increase BART's peak period passenger capacity. This investment category will provide funding for the following types of projects:

- **Upgrade major train control system infrastructure.** A train control system consists of both hardware and software that are used to control speed and movement on the rail
- **This program (and other funding sources leveraged through the program plan) will replace important train control infrastructure with up-to-date technology, allowing trains**

network, keeping trains running smoothly and eliminating any possibility of a collision. The system BART uses today is a modified version of the original system put in place 44 years ago, and it has two major limitations. First, errors in the aging system are a major cause of train delay. Currently, more than half of BART's infrastructure-related delays are due to errors in the train control system, causing BART riders to suffer from more than 400 hours of delay annually. Second, the system was not built to handle the demands of 2015 and beyond; it can safely accommodate no more than one train every 2.5 minutes on all lines combined through the Transbay Tube.



**to operate at more closely spaced intervals and at faster speeds, permitting 25% more trains through the Transbay Tube.** At the same time, the upgraded train control system will improve BART's reliability, decreasing train control-related delays and enhancing safety by upgrading the reliability of the technology that prevents train collisions.

- **Upgrade traction power capacity.** When BART's power infrastructure was designed in the late 1960's, today's level of demand for service was not envisioned. To enable BART to run more train service, the system must have more electrical power in the Transbay Tube and in downtown San Francisco than the system is designed to handle. The program will allow BART to add needed traction power cables and electrical substations to supply more electrical power in these critical parts of the system, allowing BART to fully utilize the upgraded train control system.
- **Expand vehicle storage and maintenance capacity.** To take advantage of the capacity offered by the upgraded train control system and added traction power capacity, BART must also prepare to operate a larger fleet of rail cars. New cars will be acquired through BART's Fleet of the Future program, which is separate from this program and includes a significant amount of federal funding. However, BART will not be able to operate this larger fleet without expanded maintenance facilities. This program funds expansion and reconfiguration of BART's existing maintenance facility in Hayward, giving BART the ability to service the existing fleet more efficiently, and to store and to maintain the larger Fleet of the Future, which is essential for providing more service than is offered today.

BART Operations Planning staff estimates that these investments, combined with the planned increase in the rail car fleet, will work together to increase BART's peak period passenger capacity in the Transbay corridor by 36%; this is equivalent to adding another three lanes in each direction on the Bay Bridge.

## DESIGN AND ENGINEER FUTURE PROJECTS TO RELIEVE CROWDING, INCREASE SYSTEM REDUNDANCY, AND REDUCE TRAFFIC CONGESTION

**Estimated at 6% of Program, \$0-\$210 M**

As early as the 1950's, forward-thinking Bay Area residents had the vision to anticipate the region's growing need for safe, reliable, efficient transportation and created the BART system. In the years since, BART system ridership has grown in parallel with the regional economy. BART has absorbed a large share of new travel demand, keeping hundreds of thousands of cars off the region's crowded roadways every day and helping major job centers to emerge and thrive in places that would not have otherwise been possible.

This program sets aside a small percentage of the overall bond investment to make the core system more efficient and resilient, to provide redundancy to speed up recovery from delays, and to prepare for the next generation of regional transportation needs. In the near-term, these projects could include rail crossovers, storage tracks, turnbacks, station platform doors, and ultimately, a 2nd Transbay crossing. Investments in this category will be used to evaluate, design, engineer, and perform environmental studies, subject to funding eligibility requirements, for infrastructure projects to help meet the growing demand for BART service.



## Improve station access and safety

BART’s stations are the gateways to the system. However, like much of the rest of the system, many of BART’s stations are more than 40 years old and are in need of renewal. Key stations, such as Montgomery and Embarcadero, have substantial crowding issues on platforms and escalators during peak times. As demand for BART has grown, crowding has also increased for those trying to access BART. Parking for both vehicles and bicycles reaches capacity early in the morning at many BART stations. At the same time, aging and out-of-date facilities at original stations limit many BART riders who might like to reach stations on foot, on buses, or using emerging ride-sharing services.

The program plan will improve safe and reliable access to the BART system by renewing BART stations and by enhancing opportunities to access those stations.

### RENEW STATIONS

Estimated at 6% of Program, \$210 M

The program plan will allow BART to renew its aging stations, improving comfort, safety and security, and overall station capacity. By inviting more riders into the BART system, these investments will also help to keep cars off the road. Examples of projects in this area include:

- **Invest in safety, security, and reduced fare evasion.** BART will invest in enhanced station lighting and better sight lines to improve passenger safety and security, and invest in new infrastructure to improve security and reduce fare evasion.
- **Repair, replace, and upgrade escalators and elevators to increase capacity and improve stations for people with disabilities.** BART will invest in replacing, and providing

## Addresses Goals



SAFETY



RELIABILITY



CROWDING RELIEF

# 9%

of Program

# \$310

Million

canopies to weatherproof system escalators to ensure fast and convenient access to and from platforms, with a particular focus at the busiest subway stations on Market and Mission Streets in San Francisco, and in downtown Oakland. BART will also add new elevators and reconfigure existing elevators. These investments are crucial both for enhancing the capacity of the most crowded stations, and for providing safe, comfortable access for all, particularly seniors, people with disabilities, and families with strollers.

- **Upgrade stations to better reflect and connect to surrounding communities.** BART stations are gateways to existing communities and targeted sustainable growth areas. These

funds will leverage planned station renovation projects, for example at Balboa Park, Civic Center, Concord Downtown Berkeley, Richmond, and West Oakland, to install design elements, and art that will improve the experience of stations for passengers while better connecting those stations to surrounding communities.

## EXPAND OPPORTUNITIES TO SAFELY ACCESS STATIONS

**Estimated at 3% of Program, \$0-\$100 M**

The goals of BART's access program include: a healthier, safer, and greener BART system; more riders; a more efficient and productive system; a better rider experience; and equitable services.

BART will leverage funding from the program plan with funds from several sources, including BART parking fees as well as state, local, and regional grant funds, to enhance access opportunities throughout the BART system in a way that best addresses these goals. Examples of projects in this category include:

- **Enhance access for seniors and people with disabilities.** The program will fund projects to enhance station accessibility and ensure that stations are available to all. BART will make improvements to escalators and elevators to increase reliability for seniors and people with disabilities. BART also has plans to replace handrails and guardrails at 34 stations, upgrade the public address systems so passengers can better hear important announcements and improve customer safety by renovating the fire alarm system to include flashing strobe lights designed to alert those with hearing issues during an emergency.
- **Improve parking availability.** The program will fund projects to improve the availability of parking systemwide.

Improved parking management strategies will be combined with efforts to increase the supply of parking for BART riders at stations where it can be done cost-effectively and in partnership with local communities.

- **Expand bicycle facilities.** The program will fund implementation of BART's Bicycle Capital Plan, which focuses on enhancing secure bicycle parking throughout the system. BART's plan calls for adding 6,000 secure bicycle parking spaces to help achieve the goal of accommodating bike parking for 8% of BART passengers. New secure bicycle parking facilities are now planned at Pleasant Hill, Concord, MacArthur, and Lafayette Stations. Stations that will require secure bicycle parking facilities in the next five years include Lake Merritt, San Leandro, West Oakland, Rockridge, Glen Park, North Berkeley, Del Norte, and Dublin/Pleasanton Stations. BART will also partner to help implement the expanded Bay Area Bike Share program and other important bicycle projects.
- **Renew bus intermodal facilities.** Many of BART's bus intermodal facilities were designed and built decades ago. The program will fund projects to upgrade these facilities to be more efficient for passengers and bus operators, to feel safer and more comfortable, and to better fit into surrounding communities. Added real-time arrival information will make bus ridership more convenient. BART will also invest in projects to meet growing demand for drop-off and pick-up zones.

Access planning will be carried out on a station-by-station basis, with a focus on a cost-effective package of investments that respond to the local context and the needs of BART customers.

# Benefits of the Plan

## Building a Better BART

BART modeling shows that without reinvestment, the condition of BART's essential infrastructure will worsen over time.<sup>8</sup> A study lead by UC Berkeley professor Elizabeth Deakin found that with a decline in the reliability of the BART, thousands of riders would choose to drive, causing major daily bottlenecks along Highway 24, I-80, I-880 and I-580.

Through this program, BART will work to halt and reverse the deterioration of system infrastructure. Among the goals of the program will be to reduce risk to BART and its riders, and to achieve as system that is less costly to maintain than it would be without the program.







## Safety: Keeps riders safe and secure

BART has no higher responsibility than keeping its rider safe. Over its 44 years of service to the Bay Area, BART's safety record is as strong as any transit service in North America. That record is maintained by the vigilance of BART system workers and sound system management practices that have prevented collisions, derailments, and other major system failures. By contrast, other transit systems of similar age have already begun to experience major safety incidents related to aging infrastructure.

The program plan will help to preserve BART's strong safety record and maintain the region's confidence in the system. For example:

- Rail renewal will allow BART to continue to safely operate at normal speeds throughout the system.
- A new, modern train control system will allow BART to operate more frequent service safely.
- Repairs to tunnels and structures will ensure that these structures are safer for riders and workers.
- Investments in improved lighting and other facilities at BART stations will help to enhance the passenger experience, facilitate easy access to the system, and improve personal security in and around BART stations.



## Reliability: Keeps BART dependable

After more than four decades of service, reinvestment to repair and replace the system's critical infrastructure is essential to restoring the high level of reliability that Bay Area travelers have come to depend on from BART. The program plan will yield a system with 40% fewer delays caused by mechanical issues than occur today, a savings of 250 hours of delay each year. For example:

- The new, modern train control system will cause fewer delay incidents than the current aging system, which was responsible for more than half of all infrastructure-related delays in 2014.
- Replacing 90 miles of original rails and rebuilding the system's major rail merges will reduce delay incidents caused by track failures. Even more

importantly, these projects will substantially reduce the risk of major failures that could cause the system to encounter severe, ongoing delays now faced by other rail systems around the country.

- Renewing BART's power infrastructure will reduce delays. By adding redundancy to the power infrastructure, BART will be far less likely to suffer severe and ongoing delays that could have major impacts on regional traffic.
- The elements of the program plan that enhance system capacity also play a role in making the system more reliable. With less crowding on trains and platforms, BART will be able to recover more quickly from any delays that do occur.

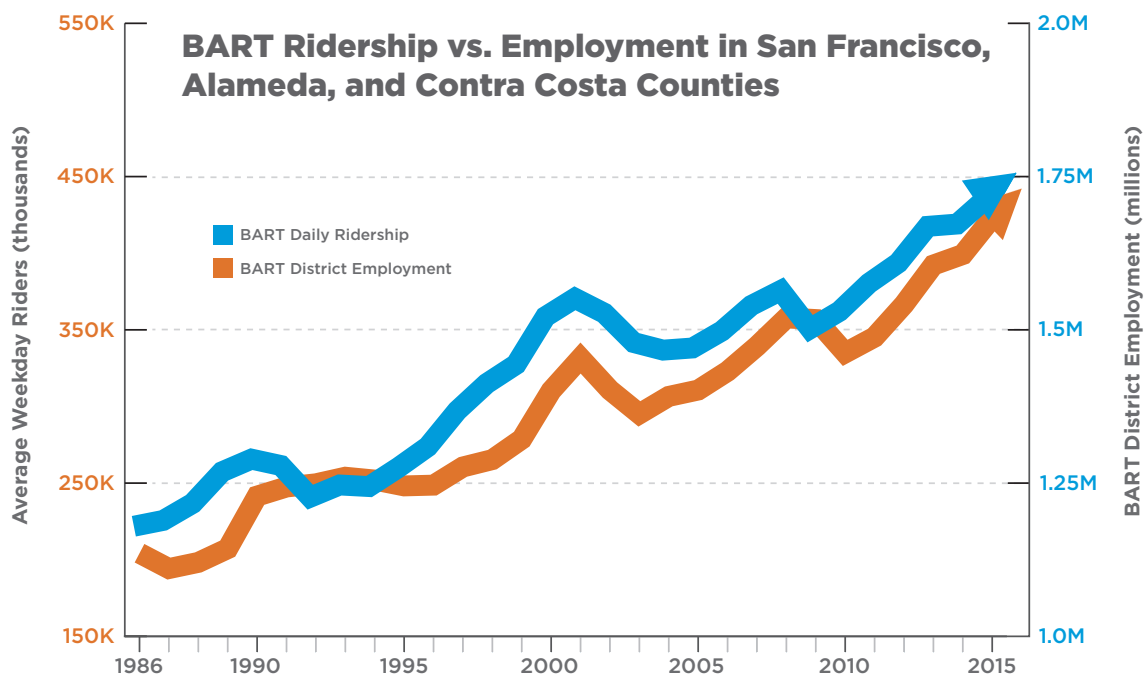
## Crowding relief: Reduces traffic, protects the environment, and makes room for the economy to grow

Over BART’s 44-year history, system ridership has grown in step with the regional economy, relieving pressure on the region’s crowded highways. Today, however, BART ridership is at or above its maximum capacity in major segments of the system during peak commute hours. Investments in BART capacity will relieve crowding and allow BART to continue to take more cars off the region’s roads. For example:

- A set of investments in system capacity, including a modern train control system, an expanded train car maintenance facility in Hayward

to accommodate a larger fleet of rail cars, and more power capacity, will provide space for approximately 36% more riders in the Transbay market – equivalent capacity to another three lanes in each direction on the Bay Bridge.

- BART’s proposed station investments, including the overhaul of station escalators and reconfiguration of platform elevators, will be important to relieving crowding at the busiest stations and allowing BART ridership room to grow.
- By providing an alternative to driving for many trips, BART helps keep cars off the road, reducing emissions and improving the region’s air and water quality. By keeping BART safe and reliable while making space for more riders, the program will preserve these environmental benefits for future generations.



Source: BART Ridership Reports; US Census, Bureau of Labor Statistics Quarterly Census of Employment and Wages

# Organizational Structure

## Governing body and administration

In enacting this measure, voters will authorize BART to administer the bond proceeds in accordance with all applicable laws and with the program. Funds collected may be spent only for the purposes identified in the program, as it may be amended as described in the implementation guidelines. Under no circumstances may the proceeds of this bond measure be applied to any purpose other than for investment in the BART system. Under no circumstances may these funds be appropriated by the State of California or any other governmental agency.

BART is governed by the BART Board of Directors, which is comprised of nine members elected from the nine BART districts in Contra Costa, Alameda, and San Francisco Counties. Board members serve a four-year term.

## Independent oversight

There will be an Independent Oversight Committee (IOC), which will have the responsibility of reviewing and overseeing all expenditures of program funds. The Independent Oversight Committee reports directly to the public and has the following responsibilities:

- IOC will track progress and effective use of funds. The IOC will meet quarterly to review project progress and monitor effective use of funds.

- The IOC meetings must be open to the public and must be held in compliance with the Brown Act, California's open meeting law, with information announcing the hearings well-publicized and posted in advance.
- The IOC will have full access to an independent auditor supplied by BART and will have the authority to request and review specific information regarding use of program funds and to comment on the auditor's reports.
- The IOC will publish an independent annual report, including any concerns the committee has about audits it reviews. The report will be published in local newspapers and will be made available to the public in a variety of forums to ensure access to this information. IOC members are private citizens who are not elected officials at any level of government, nor public employees from agencies that either oversee or benefit from the program. Membership is limited to individuals who live in the BART District. Members are required to submit a statement of financial disclosure annually, and membership is restricted to individuals with no economic interest in any of BART's projects or programs.

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# Implementing Guidelines

## Duration of the Plan

BART anticipates that the 2016 System Renewal Program Plan will be implemented over the course of twenty-one years, commencing in Fiscal Year 2017 and concluding in Fiscal Year 2038. Projects will be accelerated as practical to maximize the benefit of planned improvements as quickly as possible.

## Project Selection and Prioritization

BART uses a Strategic Asset Management Program (AMP) to guide decisions about system reinvestment, minimize risk, and maintain financial stability. The AMP relies on detailed, ongoing data collection about each asset in the system, and follows international best practices to assess the likelihood of near-term failure for each asset and understand the impact that such a failure would have on the BART system, its riders, and the region.

The AMP process will be used to guide decisions about the appropriate timing of the projects funded by this program. The process will allow BART's staff and Board of Directors, with input from the Independent Oversight Committee, to take a systematic, risk-focused approach to guide which investments will be undertaken and in what order.

The process for selecting investments from this program will be closely coordinated with BART's larger capital program.

The process will proceed as follows:

- **Understand critical reinvestment needs as they arise:** On an ongoing basis, BART staff will use the Strategic Asset Management process to rank the highest-priority reinvestment needs.
- **Prioritize reinvestment projects every year:** Annually, BART staff and Board of Directors will use the prioritized list of needs from the Strategic Asset Management process to develop a list of key system reinvestment projects to be funded in the following year.
- **Review investments with the Independent Oversight Committee:** The Independent Oversight Committee will review the identified project list.
- **Integrate projects with the larger BART capital program:** The selected projects will be integrated into BART's larger Capital Improvement Plan and associated capital budget.
- **Adopt the capital program in a publicly noticed hearing:** The capital budget will be reviewed and adopted by the BART Board of Directors following a publicly noticed hearing.
- **Review project implementation with the Independent Oversight Committee:** The Independent Oversight Committee will meet throughout the year to review progress on project implementation.

Because it is impossible to know the exact cost of renewal projects before implementation, bond resources have been divided into three major spending areas:

- Repair and replace critical safety infrastructure (\$2,555 M, 73% of Program)
- Relieve crowding and reduce Bay Area traffic congestion (\$610 M, 18% of Program)
- Improve safety and access to the BART system (\$310 M, 9% of Program)

Spending in each of these categories is fixed and will be allocated each year according to the process outlined above. Spending in each of the three major investment categories is fixed, however planned spending on the individual line items listed above are estimates. Actual spending in each line item may vary by up to 15% of the total for the corresponding major category, as BART tailors investments to respond to system needs as they arise.

## Taxpayer Safeguards, Audits, and Accountability

Accountability is of utmost importance in delivering public investments with public dollars. BART is committed to transparency and accountability as a public agency. Many safeguards are built into this measure to ensure voter accountability in expenditure of funds.

- **Annual audits and independent oversight committee review:** BART’s financial reports are subject to an independent audit by a Certified Public Accountant (CPA) firm, on an annual basis. Expenditures are also subject to an annual review by an Independent Oversight Committee. The Independent Oversight Committee will prepare an annual report on spending and progress in implementing the Plan that will be published and distributed throughout the BART district. On a periodic basis, the Independent Oversight Committee will review the performance and

benefit of projects and programs based on performance criteria established by BART as appropriate.

- **Annual Capital Budget:** Each year, BART will adopt a capital budget that includes an estimate of bond proceeds, other anticipated revenues and planned expenditures. The budget will be adopted at a public meeting of the BART Board of Directors.
- **Capital Improvement Program Updates:** Project descriptions will be detailed and fully defined for inclusion in BART’s Capital Improvement Program, which will be updated every two years. The Capital Improvement Plan will be adopted at a public meeting of the BART Board of Directors.

## Restrictions on Funds

The San Francisco Bay Area Rapid Transit District has the authority to expend these funds, if approved by the voters, only as permitted by the California Constitution. They may only be used for the acquisition or improvement of real property and would not, therefore be able to finance transit vehicles and other equipment used for BART operations.

- **Expenditures are restricted to investment in the BART system:** Under no circumstances may the proceeds of bond measure be applied to any purpose other than for investment in the BART system. Under no circumstances may these funds be appropriated by the State of California or any other governmental agency.
- **No general operating expenditures:** The proceeds of the bond measure cannot be used to support BART’s general operating needs, but must

be dedicated to the capital program outlined in this Program Plan.

- **Environmental and equity reviews:** All projects funded by the bond measure are subject to laws and regulations of federal, state and local government, including but not limited to the requirements of the California Environmental Quality Act (CEQA), and Title VI of the Civil Rights Act, as applicable. All projects and programs funded in this Plan will be required to conform to the requirements of these regulations, as applicable.

critical safety infrastructure, relieve crowding and reduce Bay Area traffic congestion, or improve safety and access to the BART system, at the discretion of BART.

## Project Financing Guidelines

- **Fiduciary duty:** The authorization of this Bond measure gives BART the fiduciary duty of administering the proceeds for the benefit of the residents of the BART district. Funds may be accumulated by BART over a period of time to pay for larger and longer-term projects. All interest income generated by these proceeds will be used for the purposes outlined in this Plan and will be subject to audits.
- **Leveraging funds:** Wherever possible, BART will use bond proceeds to leverage or match funds from outside funding sources, including state, federal, and regional funds.
- **Fund allocations:** Should a planned project become undeliverable, infeasible or unfundable due to circumstances unforeseen at the time this Plan was created, or should a project not require all funds programmed for that project or have excess funding, funding for that project will be reallocated to another project or program of the same type, such as repair and replace



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