California State Transportation Agency,
Transit and Intercity Rail Capital Program, 2020

January 2020

Transbay Corridor Core Capacity Program:

Vehicle Acquisition

Applicant Contact

Nikki Foletta, Program Manager
BART – Planning, Development & Construction
(510) 874-7346
nfolett@bart.gov

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SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT
300 Lakeside Drive, P.O. Box 12688
Oakland, CA 94604-2688
(510) 464-6000

January 15, 2020

Secretary David Kim
California State Transportation Agency
915 Capital Mall, Suite 350B
Sacramento CA 94814

Re: BART's Transbay Corridor Core Capacity Program: Vehicle Acquisition – 2020 Transit and Intercity Rail Capital Program (TIRCP)

Dear Secretary Kim:

On behalf of the San Francisco Bay Area Rapid Transit District, I am pleased to submit BART's request for $119 million in funding from the 2020 Transit and Intercity Rail Capital Program (TIRCP).

BART's Transbay Corridor Core Capacity Program is a vital program that:

- Achieve up to 45% in additional capacity on the existing BART system,
- Improve system reliability and greatly enhance the customer experience,
- Significantly reduces greenhouse gas emissions statewide and nationally,
- Provides access to jobs thereby stimulating the economy; and
- Provides mobility as well as regional and statewide transportation connections for all residents including those in disadvantaged communities.

BART's current Transbay Corridor ridership far exceeds capacity in the peak hours, with riders often enduring excruciatingly crowded conditions. BART's ability to increase ridership – and the region's ability to steer growth to places served by transit – depend upon additional BART capacity in the Transbay Corridor.

BART has worked diligently to develop a comprehensive funding plan for the Transbay Corridor Core Capacity Program. Current funding sources consist of a combination of federal, state, regional, and local funds, including BART's own capital allocations (funding transferred from BART's operating budget to its capital budget) and funding provided by the successful passage of a general obligation bond for BART, called Measure RR, in November 2016.

The Metropolitan Transportation Commission (MTC) Plan Bay Area 2040 program identified BART's Transbay Corridor Core Capacity Program as a critical regional need and has included this project in its Core Capacity Challenge grant program. BART is also working closely with the federal government on a Capital Investment Grant (CIG) , and is currently in final negotiations with FTA on the Full Funding Grant Agreement (FFGA). In addition, BART has requested funding from various local county sales tax measures. TIRCP funds would close the remaining funding gap for BART's Core Capacity rail cars; and

allow BART to achieve the largest capacity boost possible, while renovating and maintaining the core BART system.

This TIRCP funding request is for $119 million to acquire 34 additional new BART rail cars - a critical component of the overall Core Capacity Program. The additional rail cars are needed to achieve up to 45% in additional capacity on the existing BART system, improve system reliability and greatly enhance the customer experience.

Included in this grant proposal is an additional request of $250,000 to directly engage local community-based organizations in Disadvantaged Communities on the potential impacts of BART's Transbay Corridor Core Capacity Program. BART has extensive experience working with members of low-income, minority, limited English speaking, faith-based, environmental, disability rights, and social justice communities and organizations, and will build upon that work in solicitating input on this important project.

We appreciate your consideration of this application. As BART's General Manager, I have reviewed the materials submitted and approve the cost estimates provided in this application, including the amounts and fund sources cited. Please feel free to contact us with any questions or requests for additional materials if needed.

Please do not hesitate to contact me or Nikki Foletta, Program Manager – Core Capacity, at 510-874-7346, or nfolett@bart.gov.

Sincerely,

Robert M. Powers
General Manager

BEFORE THE BOARD OF DIRECTORS OF THE
SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

In the Matter of Authorizing the Filing of Applications, Providing Supporting Documents, and Executing Funding Agreements with the United States Government, the State of California, and other Entities

Resolution No. 5223

WHEREAS, the San Francisco Bay Area Rapid Transit District ("BART") is eligible to receive Federal and/or State funding for certain transportation planning related activities through the U.S. Department of Transportation and the California Department of Transportation; and

WHEREAS, pursuant to Board Resolutions Nos. 4372, 4373, 4898 and the Annual Budget Resolution, the BART General Manager is authorized to file funding applications and execute funding agreements with the United States Government and the State of California and with any other entity; and

WHEREAS, a Fund Transfer Agreement is needed to be executed with the California Department of Transportation before such funds can be claimed through the Transportation Planning Grant Programs; and

WHEREAS, funding agreements from the United States Government or the State of California will impose certain obligations upon the applicant, including the provision by the applicant of the project's local share of costs; and

WHEREAS, it would be in the best interests of the District for the General Manager to have standing authorization to apply, on behalf of the District, for funds from entities and to file necessary documents and execute funding agreements.

NOW, THEREFORE, BE IT RESOLVED by the BART Board of Directors:

1. That the BART General Manager, or her/his designee, is authorized to execute and file all applications on behalf of the BART for funds for District projects and activities with any agency of the United States Government or the State of California or any other entity.

2. That the BART General Manager, or her/his designee, is authorized to execute and file with such applications any assurance or other document required by the funding entity for the subject project.

3. That the BART General Manager, or her/his designee, is authorized to furnish such additional information as the funding entity may require in connection with the application or funding agreement for the subject project.

SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT
CERTIFIED A TRUE COPY

KENNETH A. DURON, DISTRICT SECRETARY

Adopted October 24, 2013

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4. That the BART General Manager, or her/his designee, is authorized to execute all funding agreements on behalf of BART with any agency of the United States Govemment or the State of California or any other entity

5. That the BART General Manager is authorized to execute and file applications on behalf of BART for funds for BART District projects and activities with any private entity, but execution of funding agreements with a private entity requires approval of the BART Board of Directors.

This Resolution supersedes Board Resolution No. 4898 dated October 9, 2003.

2 Program Narrative

Transbay Corridor Core Capacity Program

Applicant Name	San Francisco Bay Area Rapid Transit (BART) District
Program Purpose and Need	The Transbay Corridor Core Capacity (Core Capacity) Program will increase the number of trains operating through the Transbay Tube in the peak period, and increase train lengths, to reduce crowding and maximize throughput capacity in the most heavily used part of the existing BART system. This will lead to increased ridership and reduced GHG emissions throughout the Transbay Corridor and Bay Area.
Program Location	BART is located in the San Francisco Bay Area, in the counties of San Francisco, Alameda, Contra Costa, San Mateo, and Santa Clara. Specifically, the Core Capacity Program is focused in the Transbay Corridor, connecting the East Bay with San Francisco and the Peninsula. The Transbay Corridor is also served by the San Francisco-Oakland Bay Bridge, which is operating at full capacity during peak periods. See *Section 2.3.2.1. Program Background* for a map of BART.
Program Mode	Heavy Rail
Multi-Agency Coordination	BART is coordinating with MTC to complete the Core Capacity Program. The program is included in MTC's adopted Regional Transportation Plan (RTP), and MTC has been working with BART to assemble funding from various sources. A letter confirming this in *Appendix A. Letters of Support*. BART is also coordinating with other regional and local transportation agencies. See *Section 2.4.3.3 Rail and Transit Integration*.
Green House Gas (GHG) Reductions	The Program increases BART and other transit services ridership, thus reducing VMT and GHG emissions in the Bay Area. Additionally, increased BART capacity supports planned increases in housing and employment density around BART stations, allowing the Bay Area to meet requirements of the California Global Warming Solutions Act of 2006 (AB 32). Specifically, the Core Capacity Program will have the following benefits: • 6,767,159 metric tons of carbon dioxide-equivalent removed over Program period, for the entire Core Capacity Program – and 2,222,649 are associated with this 2020 TIRCP request • .015485 metric tons of carbon dioxide-equivalent removed per dollar of total GGRF funds requested for the Core Capacity Program, and .018678 metric tons removed per dollar of 2020 TIRCP funds requested
Funding	BART is requesting $119 million in 2020 TIRCP funds to fully fund the remaining 34 vehicles of the original 306 new rail vehicles that were not funded through the 2018 TIRCP Award. This element is referred to as the TIRCP 2020 Scope. BART is requesting an additional $250,000 in 2020 TIRCP funds for targeted community outreach. See *Section 2.1 Program Costs* for more information.
BART Point of Contact	Nikki Foletta, Program Manager – Core Capacity BART – Planning, Development & Construction 300 Lakeside Drive Oakland, CA 94612 (510) 874-7346, nfolett@bart.gov

2.1 Transbay Corridor Core Capacity Program Updates

The Transbay Corridor Core Capacity Program has progressed steadily since the 2018 TIRCP award for a portion of CBTC and Vehicle funding.

- In June 2019, the Core Capacity Program was approved for Entry into Engineering by the Federal Transit Administration (FTA), an important milestone in the federal Capital Investment Grant (CIG) process. Concurrently, the FTA allocated $300M of federal CIG funds to the Core Capacity Program, signaling their commitment to funding this project.
- BART expects that the Core Capacity Program will receive a Full Funding Grant Agreement (FFGA) from the FTA in early 2020, fully funding the $1.169 federal CIG portion of the program. This is reflected in the Funding Plan included in this application.
- BART is proceeding to negotiate a follow-on contract with Bombardier for procurement of the 306 vehicles necessary for the increased capacity through the Transbay Tube. Bombardier is producing BART's current order of 775 replacement vehicles, and this follow-on procurement will ensure technological compatibility of the vehicles, as well as expedite program delivery.
- Procurement for the Communications-Based Train Control (CBTC) system is active with an NTP date estimated as April 2020. The BART Board of Directors has selected a bidder and made a conditional intent to award, which is contingent on a signed FFGA with the FTA.

Despite the progress noted above, funding gaps have been identified, and this 2020 TIRCP application is necessary to fully fund the remaining 34 Vehicles, which is a program element necessary to providing the ridership, greenhouse gas, and other community benefits discussed in this application, and which were partially funded through the 2018 award. The following sections detail this gap, and describes the additional need that is being requested in 2020 TIRCP funds.

2.2 Program Costs

The overall Core Capacity Program includes four elements – a new communication-based train control system, 306 additional rail vehicles, an additional rail vehicle storage facility, and five additional traction power substations. BART is seeking TIRCP 2020 funding for one of these elements:

- 34 of the 306 new vehicles necessary to achieve Core Capacity benefits

Due to the integrated nature of the Core Capacity Program, the 2018 TIRCP application showed combined total benefits for the overall Program (all four elements). However, benefits described in this application regarding GHG emissions can be attributed to the new 34 vehicles for which BART is currently requesting TIRCP funding. This is noted in the text when relevant. vehicles.

Table 2-1 presents the total costs of the Program and the amount requested from TIRCP. BART is requesting $119 million for the new 34 vehicles in this TIRCP funding cycles. The Program is currently at the 65% design stage, and cost estimates reflect this level of design, including appropriate level of contingency. The 34 Vehicles (TIRCP Scope) are at 100% design, as predecessor cars are already in production. BART's 2018 TIRCP application reflected the Core Capacity Program costs at the 30% design

stage. As the level of completeness of the Program's planning has progressed, the Program costs shown in the following tables has changed slightly.

The TIRCP 2018 award claimed benefits related to 272 cars of the 306, and this $119 million request will fund the remaining crucial 34 vehicles.

Table 2-1. Core Capacity Program Costs and TIRCP Scope Request

Program Scope	Total Program Cost ($ millions)	*TIRCP 2020 Request ($ millions)*
Vehicles (Does not include $250,000 for Post-Award Community Outreach)	$1,105.5	*$119*
TIRCP SCOPE TOTALS	**$1,105.5**	***$119***
Communications-based Train Control	$1,673.4	
Hayward Maintenance Complex Phase II	$334.6	
Traction Power	$136.8	
Program Management	$27.1	
Program Contingency	$249	
TOTAL	**$3,536.4**	***$119***

2.2.1 TIRCP Funding Cycle

The $119 million requested in this 2020 TIRCP application will be programmed over FY 2020-FY 2021 to FY 2024-FY 2025 and will be allocated as soon as possible post award.

2.2.2 Useable Segment Request: Less than 34 Vehicles

BART is submitting a scaled request of $60 million as a usable segment. This scaled down funding request would cover the necessary cost to complete the purchase of 17 Vehicles of the 306 that are needed to realize the benefits discussed in this application, this is half of the full request noted above.

The cost of each of the 306 vehicles necessary to realize the benefits shown in this application is $3.5 million per vehicle. Any award amount under the $119 million provided in this tiered request will be applied to purchasing additional vehicles, even if the entire remaining 34 are not fully funded. It is important to note that the results and benefits discussed in this application, as well as those associated with the 2018 TIRCP award, will not be realized until all 306 Vehicles and the CBTC system are fully funded.

2.3 BART Eligibility

BART is a public agency operating an urban/suburban rail transit service in the San Francisco Bay Area. BART assumes responsibility and accountability for the use and expenditure of program funds. BART will comply with all relevant federal and state laws, regulations, policies, and procedures.

BART is submitting this 2020 TIRCP application for the Core Capacity Program. While BART received funding in 2018 from TIRCP for the Core Capacity Program, this 2020 request only includes funding for the 34 Vehicles which were not covered in the 2018 award. Per TIRCP guidelines, this grant request cannot claim the same GHG reduction benefits as the 2018 application, and this is detailed in sections throughout this application, and specifically the Ridership and GHG modeling methodologies attached as appendices.

2.4 Transbay Corridor Core Capacity Program Benefits

The following section gives a brief overall introduction to the Transbay Corridor Core Capacity Program, including benefits derived. A more detailed discussion regarding the Program benefits, referencing the primary and secondary evaluation criteria outlined in the TIRCP Guidelines, is found below in *Section 2.3.3. Program Benefits* below.

2.4.1 Core Capacity Program Summary

The BART Core Capacity Program will relieve crowding, increase ridership, and decrease greenhouse gas (GHG) emissions by increasing the frequency and capacity of trains operating on the system. The Core Capacity Program will allow the number of trains operating through the Transbay Tube to increase from 23 to 30 per hour, and peak hour train lengths to be increased from an average of 8.9 to 10 cars, maximizing throughput capacity in the most heavily used part of the BART system. The Program includes four elements:

- Expand the rail car fleet by 306 cars;
- Install new communications-based train control system;
- Provide additional rail vehicle storage at the Hayward Maintenance Complex (HMC); and
- Install five new traction power substations.

These four Program elements will allow BART to decrease current headways on each line from 15 minutes to 12 minutes. Expansion of the rail car fleet will allow for trains of 10 cars, adding capacity in the existing system. The overall increase in peak hour capacity created by the Core Capacity Program will be about 45%. (See *Appendix C. Ridership Modeling and Methodology* for more information.) Decreased headways and increased capacity result in an estimated increased average weekday ridership of 202,972 BART riders beyond current levels and will decrease GHG emissions by at least 6,767,159 metric tons of carbon dioxide equivalent ($MTCO_2e$) over a 50-year period. The portion of decreased GHG emissions apportioned to this 2020 TIRCP application is 2,222,649 metric tons of $MTCO_2e$ over a 50-year period. Additionally, the Core Capacity Program will replace systems that are at the end of their service life, will enhance system reliability and safety. Lastly, the increased frequency and capacity of the BART

system will increase ridership levels on other transit systems throughout the Bay Area. This is detailed in Section 5.1.1.1 and Appendix C. Ridership Modeling Methodology.

Figure 2-1. Crowding on BART in Transbay Tube

Additional benefits include the reduction of vehicle miles traveled (VMT) on Bay Area roadways by making transit more attractive to existing and new riders. Specifically, this increased transit ridership from the entire program will reduce VMT by an average of 577,968,743 miles per year (including other Bay Area transit services ridership increases). Increased frequency and quality of service (system reliability and reduced crowding for riders) will assist in retaining existing and attracting new riders to the system.

The many Disadvantaged Communities (DACs) and other designated communities located along the BART system and within the BART service catchment area, will also benefit from increased frequency, greater capacity and reduced crowding. Nearly all the 48 BART stations have been designated by MTC as Priority Development Areas (PDAs). These PDAs are a key part of the region's strategy to meet requirements of the California Global Warming Solutions Act of 2006 (AB 32). The additional transit capacity resulting from this program will enable these areas to grow, which will help the Bay Area to realize its Sustainable Communities Strategy outlined in Plan Bay Area 2040 (Appendix F).

2.4.2 Detailed Program Description

2.4.2.1 Program Background

In 2010, the nine-county region was home to more than 7.6 million people and 3.7 million jobs. Some 300,000 jobs are located in San Francisco's central business district alone, the fourth largest central business district in the country.[1] The Bay Area's economy is healthy and growing, driven in part by the technology sector that is vital to growing the nation's overall economy. Downtown San Francisco is undergoing large construction projects that will increase office space and enable the city to add more jobs. By 2040, the region expects 9.3 million residents and 4.5 million jobs[2] to be located here.

[1] As of 2010, American Community Survey 2006-2010
[2] https://mtc.ca.gov/sites/default/files/2-The_Bay_Area_In_2040.pdf

Figure 2-2. BART System Map

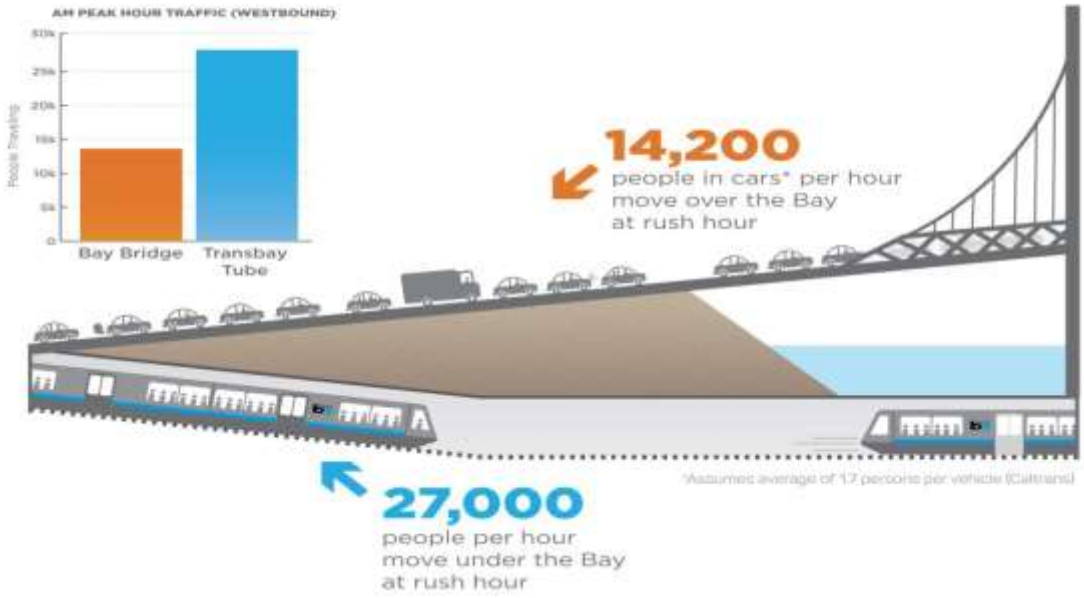
The Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG) seek to manage this future growth by steering new development to PDAs in San Francisco, Oakland, and other parts of the region that are served by BART and other transit operators.

As the Bay Area's second largest transit network, BART currently operates and maintains 48 stations and 122 miles of revenue track, serving over 440,000 passengers every weekday in the counties of Alameda, Contra Costa, San Francisco, and San Mateo.[3] For more information on BART, please see *Section 3.1 About BART.*

The Transbay Corridor is the only connection between many East Bay residential areas and jobs in San Francisco. It is the region's most heavily used transportation link, carrying more than 40,000 trips per hour in the peak, two-thirds of which are made on BART's two tracks crossing under the Bay. Virtually all the remaining trips are in cars and buses that utilize the heavily congested San Francisco-Oakland Bay Bridge (Interstate 80).

[3] https://www.bart.gov/sites/default/files/docs/Role%20of%20BART%20in%20Region%20-%20Final%20Web%20Oct%202016_1.pdf

Figure 2-3. BART's Peak Hour Transbay Market Share



On the main trunk of the BART system, from the Oakland wye (junction in downtown Oakland where trains of all routes merge) through the Transbay Tube to Daly City, BART currently operates a maximum of 23 trains per hour in each direction. Train lengths vary, but currently average 8.9 cars per train in the peak. Between the East Bay and San Francisco, peak hour trains are crowded and ridership has been growing. As the system expands – with a planned extension into Santa Clara County and a recent eastern Contra Costa opening – and as the core continues to attract development, tens of thousands of new riders are expected.

Figure 2-4. Crowding on BART Platform

BART's existing Transbay Corridor ridership exceeds capacity in the peak between the Embarcadero station in San Francisco and the Downtown Berkeley, Rockridge, and Bay Fair stations in the East Bay. Within this corridor, riders in the peak hour currently have an average of 5.2 square feet of space each, which is an uncomfortable level for passengers. The Transit Capacity and Quality of Service Manual published through the Transit Cooperative Research Program (TCRP) establishes 5.4 square feet of space per passenger as a comfortable

loading level on U.S. rail transit systems.[4] The Federal Transit Administration (FTA) has adopted this as the threshold level of crowding for funding Core Capacity projects with Capital Investment Grant funds.

The most crowded part of the BART corridor is the five-mile-long Transbay Tube between the Embarcadero and West Oakland stations, where the average rider has just 4.7 square feet of space, far less than the FTA threshold. Current BART riders endure uncomfortably crowded conditions, while some commuters choose other modes to avoid the crush-load conditions on some BART trains. BART's ability to increase ridership – and the region's ability to steer growth to places served by transit – depend upon additional BART capacity in the Transbay Corridor.

Figure 2-5. Square Feet per Passenger in Transbay Corridor

The issue of transit overcrowding through the Transbay Corridor extends beyond the BART system. To better understand the Core Capacity needs of the Transbay Corridor, the Metropolitan Transportation Commission (MTC) undertook the Bay Area Core Capacity Transit Study (CCTS) as a collaborative effort to identify and prioritize investments that will improve travel on public transit to and from the San Francisco Core.[5] The study looked at short, medium and long-term investments that could help steadily upgrade the overall transportation system and keep pace with anticipated population growth for the next quarter century. Both the BART car expansion and the BART train control system modernization were included in the study's list of prerequisite projects. Please find the MTC CCTS, which was completed in 2017, in Appendix G. MTC Bay Area Core Capacity Transit Study. In addition, both projects are included in MTC's Core Capacity Challenge grant program.

[4] TCRP Report 165
[5] https://mtc.ca.gov/our-work/plans-projects/other-plans/core-capacity-transit-study

Figure 2-6. MTC's Core Capacity Transit Study Area

2.4.2.2 Program Description

As summarized above, the Core Capacity Program includes four elements:

- Acquisition of 306 new rail cars, allowing for increased capacity per train. **(TIRCP scope)**
- A communications-based train control (CBTC) system, which will allow trains to be spaced more closely together, reducing headways. (Non-2020 TIRCP scope)
- Construction of a new railcar storage yard at Hayward Maintenance Complex Phase 2, which will create storage yard capacity for 250 rail cars. (Non-TIRCP scope)
- Five new traction power substations, supplementing BART's existing traction power in those places where there is not sufficient power to operate 30 trains per hour. (Non-TIRCP scope)

The Core Capacity Program will relieve current levels of crowding during the peak while creating the opportunity for ridership growth. Based on current ridership, the space per passenger in the corridor will be increased from the current average of 5.2 square feet to a more comfortable 7.6 square feet.

2.4.2.3 Updates Since 2018 TIRCP Application

As discussed previously, BART is requesting TIRCP funds for the remaining 34 new vehicles of the 306 necessary to completing the Core Capacity Program. This TIRCP Scope element is discussed in more detail in the following page.

The TIRCP investment will not improve private infrastructure. Additionally, the Core Capacity Program will not be competing for funding from other greenhouse gas reduction programs.

306 Additional Vehicles - TIRCP Scope

Figure 2-7. Fleet of the Future BART Vehicle

To achieve 30 regularly scheduled ten-car trains per peak hour service, BART will require a total fleet of 1,081 vehicles. BART currently has 775 new rail vehicles on order, which will allow for the complete replacement of its aged fleet of 669 vehicles and an expansion of the fleet by 106 vehicles. When this order is completed, BART will need 306 more vehicles to achieve the total requirement of 1,081. These 306 will need to be fully compatible with the 775 now on order.

The 2018 TIRCP award that BART received covered the benefits from 272 new vehicles, leaving 34 unfunded. This request, therefore, is for the remaining 34 cars which are not claimed in the 2018 award. Since that award, BART has moved forward with a procurement for the 306 cars with Bombardier, who are currently delivering the 775 now on order. This follow-on contract will reduce BART costs and expedite project delivery.

2.4.3 Project Benefits - Primary Evaluation Criteria

The Core Capacity Program meets each of the TIRCP's primary evaluation criteria in specific and measurable ways. The estimated useful life of the Program, for the TIRCP scope asset type of the rail vehicles, is 50 years. This is discussed in more detail in *Section 2.4.3.1. Reduction of Greenhouse Gas Emissions.*

2.4.3.1 Reduction of Greenhouse Gas Emissions

For detailed methodology and results of the GHG analysis, please see *Appendix B. GHG Emissions Modeling and Methodology*. The excel version of the GHG emissions model is included in this application and is named "**CoreCapacity_Vehicles_calc**." Results of this analysis and some inputs are shown in this section.

Consistent with California Air Resources Board's (ARB) *Quantification Methodology for the California State Transportation Agency Transit and Intercity Rail Capital Program*, CO_2e emissions reductions for the first operational year (Yr1 - 2031) and the final operational year (YrF - 2080) of portions of the Core Capacity Program were estimated based on Program operating data. GHG emissions reductions rely on the increased ridership estimates detailed in *Section 2.4.3.2. Increased Ridership* and *Appendix C. Ridership Modeling and Methodology.*

Table 2-2 summarizes the lifetime CO_2e reductions, which were quantified assuming a 50-year Program life. The Core Capacity Program life of 50 years is based on the expected service life of all elements of the BART Core Capacity Program, with the main element being the CBTC system.

Results are presented in terms of TIRCP and total GGRF funds requested per metric ton CO_2e reduced and lifetime CO_2e reductions per TIRCP and total GGRF funds requested.

Table 2-2. GHG Model Results

Pollutant	Total Project Reductions	Reductions from 2020 TIRCP Funds Requested
Total GHG Reductions	**6,767,159 $MTCO_2e$**	**2,222,649 $MTCO_2e$**
Total GHG Emission Reductions/Total GGRF Funds Requested ($MTCO_2e$/$)	**.015485 $MTCO_2e$ /$**	**.018678 $MTCO_2e$ /$**
Passenger VMT Reductions	31,819,818,205 miles	9,926,911,639 miles
Reactive Organic Gases (ROG)	205,396 lbs ROG	64,078 lbs ROG
Oxides of Nitrogen (NO_X)	1,434,835 lbs NO_X	447,629 lbs/NO_X
Fine Particulate Matter ($PM_{2.5}$)	1,290,671 lbs $PM_{2.5}$	402,654 lbs $PM_{2.5}$
Diesel Particulate Matter (DPM)	1,598 lbs DPM	498 lbs DPM

Based on the total GHG reductions over the lifetime of the Program (6,767,159 $MTCO_2e$), the following equivalencies are shown for the Core Capacity Program[6]:

- Over 700 million gallons of gasoline
- Over 7 billion pounds of coal
- Nearly 800 thousand homes' energy use for 1 year
- Over 15 million barrels of oil

Additionally, GHG reductions from the Core Capacity Program is equivalent to carbon sequestered by:

- Over 100 million seedlings grown for 10 years
- Nearly 9 million acres of US forests in one year

Additional GHG Emissions Analysis for the Core Capacity Program

The ARB TIRCP Calculator quantifies GHG emissions associated with electricity consumption based on emission factors for the statewide grid average power mix. Because BART's GHG emissions from electricity generation will likely be lower in the future based upon plans to purchase a higher percentage of energy from renewable sources, the total program GHG benefits are likely understated.

BART currently receives 4% of its electricity supply from renewable sources, but that will increase dramatically with two recently approved 20-year renewable energy power purchase agreements. BART

[6] These equivalencies were calculated based on the EPA Greenhouse gas equivalencies calculator: https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator

expects these agreements to provide about 75% of BART's electricity needs beginning in 2025 and has a goal to get 100% of its electricity from renewable sources by 2045.

The Core Capacity Program will begin operation in 2031, after these purchasing changes will take effect. To show a more precise GHG benefit that includes these purchasing changes, the GHG emissions output from the TIRCP tool was adjusted to reflect the additional GHG savings realized by operating the trains using power generated by a lower percentage of fossil fuels (Table 2-3). The GHG emissions from energy use were scaled by the percentage of fossil fuels used in 2025 (25%) by the percentage of fossil fuels used currently (96%). This is equal to a factor of .26 and is reflected in the table below.

Table 2-3. GHG Benefits Adjusted for Renewable Energy Assumptions

	Total Program $MTCO_2e$	Explanation
Total Project GHG Benefit	6,767,159	TIRCP Tool Output
Total Project GHG Benefit with no energy usage from new rail cars	9,577,979	TIRCP Tool Output
Calculated GHG emissions from new rail car energy usage	2,810,820	(9,577,979 – 6,767,159)
Adjusted emissions from energy usage assuming 75% renewables	731,984	(2,810,820 * 25% / 96%)
Adjusted Total Project GHG Reduction	**8,845,995**	**(9,577,979 – 731,984)**

Accordingly, increased Program emissions reported by the ARB TIRCP Calculator overstate actual GHGs associated with added electricity consumption. Given BART's future renewable energy goals, the Program cost effectiveness reported is most likely conservative. For more information on BART's Strategic Energy Plan, please see *Section 2.4.4.9. Other Air Quality Benefits.*

2.4.3.2 BART Ridership Benefits

For detailed methodology and results of the ridership increase from the Core Capacity Program, please see *Appendix C. Ridership Modeling and Methodology*. Results of this analysis and some inputs are shown here.

The ridership analysis detailed below relies on the same ridership analysis completed for BART's 2018 TIRCP application. The ridership increases noted in that application, and below, are not possible without both the 306 Vehicles and CBTC implementation. The GHG modeling done as part of this 2020 TIRCP application removes the benefits allocated to the 2018 TIRCP award, but the ridership analysis is consistent with the previous application, as is reflected in the GHG model attached to this application.

The Core Capacity Program is expected to increase ridership by increasing service frequency and car lengths throughout the system. The methodology described in *Appendix C. Ridership Modeling and Methodology* details how the following increases in ridership were developed, as well as constraints on

ridership increases. This ridership increase was a main input to the GHG emissions modeling described in the previous section.

For the BART Core Capacity TIRCP application, an updated ridership estimate was determined based on the increased frequency described above for the Program once complete. To predict the ridership benefits of the Core Capacity Program, the June 2016 level of 435,973 riders per day was established as the constrained baseline. The capacity of the system through the Transbay Tube will stay constrained until the completion of the Core Capacity Program in FY 2031.

Table 2-4. Capacity Constrained Weekday Ridership Increase from Core Capacity Program

Program Milestone	Date	Weekday Capacity Constrained Ridership	BART Ridership Growth from Program
Base Ridership – At Capacity	2016	435,973	
Core Capacity Program Complete	2030		
Year 1 of Core Capacity Implemented	2031	587,145	151,172
Year Final of Core Capacity Implemented	2080	638,945	202,972

Completion of the Core Capacity Program will allow BART to increase the peak hour capacity through Transbay Tube by 45 percent during the peak period. Assuming current ridership trends continue, the capacity constrained ridership after the completion of the Core Capacity Program will be about 45 percent higher than the current capacity constrained ridership. This leads to an average weekday systemwide capacity constrained ridership of 638,945 with the Core Capacity Program. This is an increase of 202,972 average weekday riders due to increased capacity alone. Under the most likely ridership increase scenario, which is based on increased frequency, shown in *Appendix C. Ridership Modeling and Methodology*, this 638,945-capacity limit is expected to be reached in 2037.

Additionally, this increase in average weekday riders could, at a minimum, increase ticket revenue by over $400,000 per weekday.

An additional ridership analysis was conducted for this 2020 TIRCP application that detailed the increase of ridership levels on other Bay Area transit systems because of the increased frequency and capacity that BART's Core Capacity Program will bring. Because the Core Capacity Program is expected to increase ridership throughout the system, it will have a positive impact on the ridership numbers of connecting transit services. As part of the ridership modeling included in this application, 65,800 weekday riders will be added to the connecting transit services to BART because of the Core Capacity Program. Details of this analysis can be found in *Section 2.5.1.1* and *Appendix C. Ridership Modeling Methodology.*

2.4.3.3 Rail and Transit Integration

BART provides the backbone transit system throughout the Bay Area. Every BART station provides local bus connections, with some BART stations providing major intermodal transit connections to a

substantial number of other transit services such as Caltrain, MUNI light rail and bus, AC Transit, SamTrans, Golden Gate Transit, ACE commuter rail, WETA ferries, and bus services to and from Solano and Napa counties (Figure 2-8).

Capitol Corridor, which provides rail service from the Sacramento Valley to San Jose, connects with BART at both the Richmond and Coliseum stations, and in 2017, over 160,000 riders transferred between systems at these two stations. The Richmond BART station also provides connections to Amtrak's San Joaquin and California Zephyr services. In addition, BART provides direct service to both the San Francisco and the Oakland International Airports. Over 125 private and publicly funded shuttle services – from medical, university, senior center, employment and high tech services – provide rides to and from BART stations throughout the system, and many BART riders increasingly rely on the emerging Transportation Network Companies (TNCs) such as Uber and Lyft for "last mile" trips.

Table 2-5 lists major transfer points to rail systems and with multiple bus systems, although bus to BART transfers occur at virtually every station in the system.

Table 2-5. BART Major Transfer Points

BART Stations	Other System Connections
Embarcadero (Transbay Terminal)	MUNI light rail Muni bus and cable car AC Transit WETA ferries SamTrans Golden Gate Transit Future California High-Speed Rail WestCAT SolTrans Amtrak buses Greyhound
Richmond	Capital Corridor AC Transit Amtrak San Joaquin and Zephyr Golden Gate Transit
Oakland Civic Center and 19th Street	AC Transit
Oakland Coliseum	Oakland International Airport Capitol Corridor AC Transit
El Cerrito del Norte	AC Transit SolTrans (Solano County) Napa Valley Transit WestCAT Golden Gate Transit
Dublin/Pleasanton	AC Transit County Connection MAX BART Express

	San Joaquin RTD Stanislaus Regional Transit Livermore-Amador Valley Transit (LAVTA)
Berryessa (opens 2018)	VTA light rail and bus
Millbrae	Caltrain SamTrans Future California High Speed Rail
Fremont	ACE (via AC Transit) AC Transit VTA
Powell	MUNI light rail (central subway) MUNI bus and cable car
San Jose Diridon (Future)	Caltrain ACE Amtrak Intercity Capitol Corridor VTA Light Rail and Bus Future California High Speed Rail

BART and 21 other Bay Area transit systems use the regional the Clipper Card fare collection system, facilitating transfers from one system to another. From August 2018 to August 2019, a monthly average of nearly 30% of all BART's riders transferred to another Bay Area operator from BART. Looking at Clipper usage data from this time period, BART can identify riders that use their Clipper Card on more than one transit system in a regular month. Of the 21 transit operators that were using Clipper at that time, all services that connect with BART have riders that use Clipper on both systems. For the major transit operators that connect to BART, 29% of AC Transit riders, 20% of SF MUNI riders, 12% of Caltrain riders, and 22% of SamTrans riders transferred to BART in a regular month.

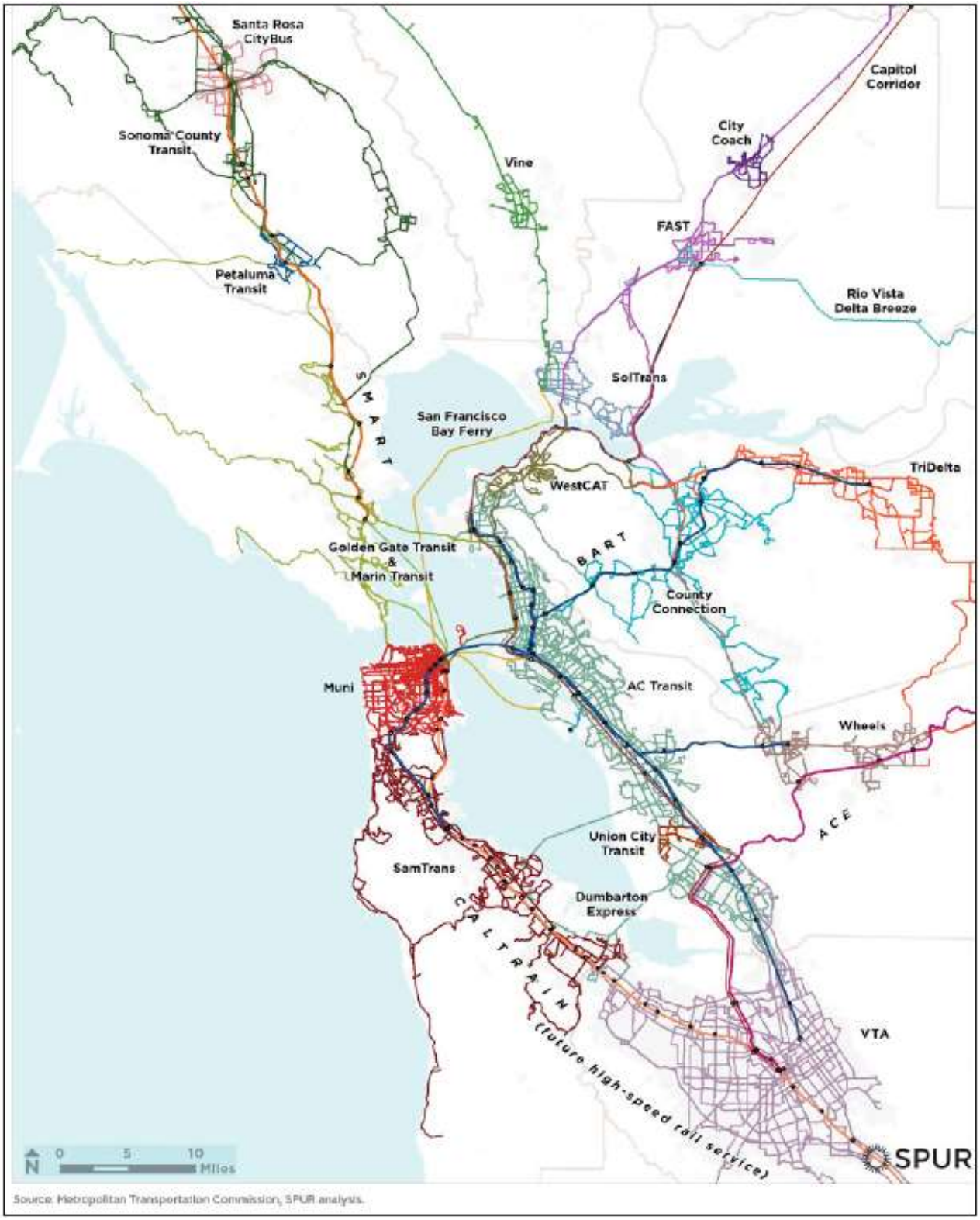
Starting January 1, 2018, BART instituted fare changes that included a 50-cent per trip surcharge on the magnetic stripe tickets, in part as an incentive to move riders to using the Clipper card. BART has also completed the installation of Clipper card vending machines at all BART stations. It is anticipated that these changes will substantially increase the percentage of riders using Clipper cards. Seamless ticketing between systems will further encourage riders to use transit to access the BART system.

Transit agencies that are either currently connected to the BART system or have plans for integration will benefit from growth in BART capacity through the Core Capacity Program, as BART provides its passengers with connections to destinations throughout the Bay Area.

2.4.3.4 Ridership Benefits on Other Systems

As noted previously, additional analysis has been undertaken as part of this 2020 TIRCP application that determines the ridership increases on Bay Area transit systems because of the increase in capacity and frequency due to the Core Capacity Program. Details of this analysis can be found in *Section 2.5.1.1* and *Appendix C: Ridership Modeling Methodology.*

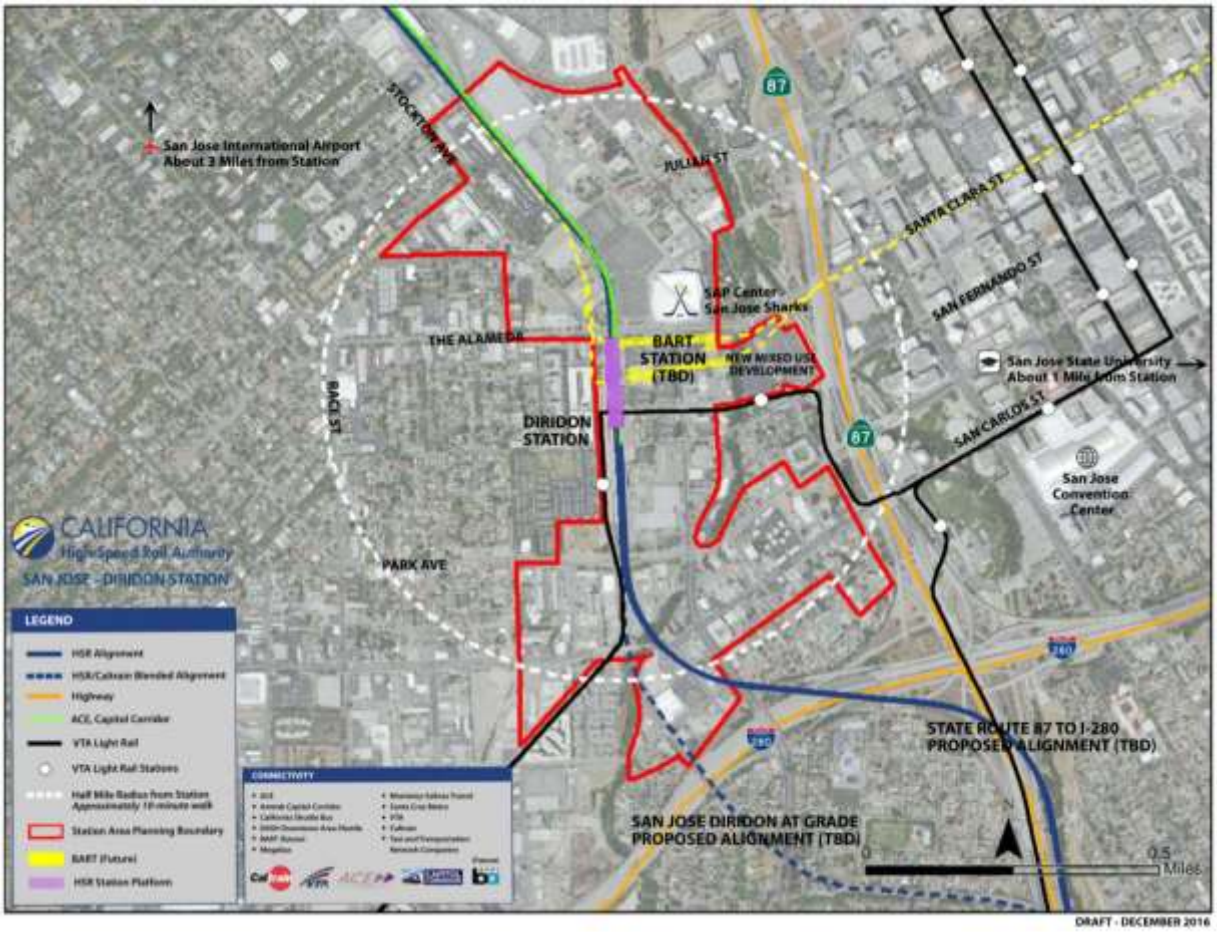
Figure 2-8. BART Connections in Bay Area



California High-Speed Rail Connections

Increasing BART capacity is particularly important for accommodating those travelers who will use the California High-Speed Rail System, which is currently under construction in the Central Valley and will connect San Jose to north of Bakersfield, per the California High-Speed Rail 2018 Business Plan.[7] The success of the high-speed rail system is highly dependent on connections to those transit systems that provide regional and local access. BART interfaces will occur at the downtown San Francisco Transbay Terminal, the San Jose Diridon Station, and the Millbrae BART station (Figures 2-9, 2-10, 2-11). Once built, the California High-Speed Rail system is estimated to bring 24,100 daily entries and exits to the SF Transbay Terminal and 2,500 to the Millbrae station. These new trips would yield approximately 3,300 daily transfers to BART.

Figure 2-9. Proposed Diridon Station and BART Connection[8]



[7] https://www.hsr.ca.gov/docs/about/business_plans/2018_BusinessPlan.pdf
[8] http://www.hsr.ca.gov/docs/newsroom/maps/San_Jose_StationMap.pdf

Figure 2-10. Proposed Transbay Transit Center

Figure 2-11. Proposed Millbrae Station[9]

[9] http://www.hsr.ca.gov/programs/station_communities/millbrae-SFO.html

2.4.3.5 Improve Safety

The new 34 rail cars being requested in this application will be part of BART's Fleet of the Future and will include many new safety features. BART's new car design includes tripod poles that are strategically placed to give riders additional support, especially during times of peak hour crowding (Figure 2-12), while also ensuring room for people in wheelchairs and those with luggage or strollers. Seats are positioned slightly higher providing room to stow backpacks, luggage and strollers. Specially designated bicycle parking is included as well.

Figure 2-12. Interior of New BART Car, Tripod Poles

To address the needs of customers with vision and hearing impairments, the new BART cars include interior and exterior digital displays, inter-car barriers, clear, automated announcements, and pole markings to improve contrast. For customers with mobility impairments, the new BART cars include differently-colored priority seating, floor markings for wheelchair areas, seats that are higher off the floor making it easier to sit down and stand up, and intercoms located near doors.

Currently in the evening peak, the BART platforms at Embarcadero and Montgomery tend to become extremely crowded, particularly when there is a service disruption or incident on the Bay Bridge. Extreme crowding on the platform can lead to unsafe conditions when people are too close to the platform edge. More frequent and longer trains will relieve crowding on BART platforms.

Additionally, though not included in the TIRCP request, the Hayward Maintenance Complex (HMC) facilities will ensure that the new cars will receive the maintenance and servicing necessary to operate safely and efficiently throughout their lifetime.

Lastly, BART's existing train control system, originally built over 40 years ago, is reaching the end of its useful life. The new CBTC system will be a proven technology, ensuring that BART can operate more trains closer together, while maintaining the highest level of safety in train operation. Many systems

worldwide have now converted to CBTC, such as the London Underground, the Paris Metro, portions of the New York City subway, and others, and BART will be following this path using fully tested and certified technology.

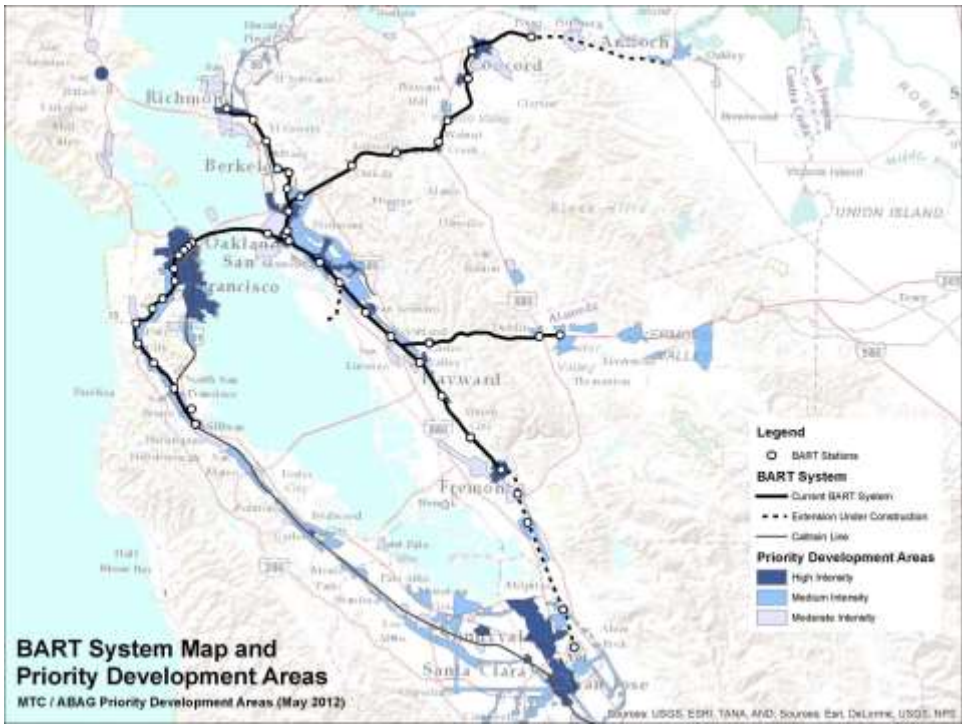
2.4.4 Additional Project Benefits - Secondary Evaluation Criteria

2.4.4.1 Reduced VMT through Growth in Ridership

As stated previously, the increased capacity from the Core Capacity Program will increase BART peak period ridership by approximately 45 percent. Based on this ridership increase, an average trip length of 13.5 miles, and an annualization factor for transit dependency of 291.5[10], the ARB TIRCP Calculator estimates that implementation of the Program will reduce regional VMT by an average of 577 million miles per year. Over the 50-year life of the project, this equates to over 27 billion vehicle miles reduced as result of the Core Capacity Program. For more details on reduction in VMT, please see *Appendix B. GHG Emissions Modeling and Methodology.*

2.4.4.2 Housing Development

Figure 2-13. BART System Map and Priority Development Areas



A key aspect of Plan Bay Area (Appendix F. Plan Bay Area 2040), which contains the Bay Area's strategy for reducing GHG emissions, is to concentrate new housing and jobs in designated Priority Development Areas (PDAs) that are served by BART and other transit operators (Figure 2-13). Plan Bay Area 2040 is both a transportation plan and a housing plan, and makes the case that the Bay Area currently has a housing crisis, with a need for a tremendous amount of additional affordable and other housing to support a growing population. Additionally, Plan Bay Area's Sustainable Communities Strategy calls for a 33 percent increase in the

[10] The 291.5 is based on average ratio of systemwide annual trips to systemwide average weekday trips included in the BART ridership forecast (2018-2040).

share of housing units located in PDAs that are well served by transit, many of which are centered around BART stations.

While BART is not directly responsible for building housing, sustaining high quality transit service is essential to supporting the regional plan for concentrating housing in places best served by transit. BART proactively supports Transit Oriented Development (TOD) on its property and around its stations. As of July 2019, twenty-four TOD projects are currently under construction, planned, or completed on BART-owned property near stations, representing over $3 billion in private investment. These projects will add over 5,600 new housing units within walking distance of BART stations (Table 2-6). In general, BART's TOD Policy encourages and supports high quality TOD, including new housing within walking distance of BART stations.

Table 2-6 Summary of Development within BART's TOD Portfolio, as of July 2019[11]

	Project (Year completed)	Total Units	Affordable Units	% Affordable	Office (SF)	Retail (SF)	Hotel (Rooms)
Completed	Castro Valley (1993)	96	96	100%			
	Fruitvale Phase I (2004)	47	10	21%	27,000	37,000	
	Pleasant Hill Phase I (2008)	422	84	20%		35,590	
	Hayward (1998)	170	0	0%			
	Ashby (2011)	0	0	0%	80,000		
	Richmond Phase I (2004)	132	66	50%		9,000	
	MacArthur Ph I & II (2016 & 2019)	475	90	19%		33,000	
	San Leandro (2017 & 2019)	200	200	100%	5,000	1,000	
	West Dublin (2013)	309	0	0%			
	East Dublin (2008)	240	0	0%			
	South Hayward Ph I (2017)	354	152	43%			
	West Pleasanton (2019)	0	0	0%	410,000		
	Coliseum (2019)	110	55	50%			
	TOTAL COMPLETED	**2555**	**753**	**29%**	**522,000**	**115,590**	
Under Construction	MacArthur Ph III (began 2018)	787	56	7%		13,000	
	Walnut Creek (began 2017)	596	0	0%			
	Pleasant Hill Block C (began 2018)	200	0	0%			
	Fruitvale Phase IIA (began 2018)	94	92	98%			
	TOTAL UNDER CONSTRUCTION	**1677**	**148**	**9%**	**0**	**13,000**	
Planned	Millbrae (Approved)	400	100	25%	150,000	45,000	164
	Pleasant Hill Block D (Approved)				~290,000		
	Fruitvale Phase IIB (Approved)	181	179	99%		6,000	
	Balboa Park (In Negotiation)	131	131	100%		3,000	
	West Oakland (In Negotiation)	~750	~240	~32%	~380,000	~50,000	
	Lake Merritt (In Negotiation)	~500	~200	~44%	~500,000		
	North Concord (Solicitation in 2019)	~360	~90	~25%	~800,000		
	GRAND TOTAL - ALL PHASES	**5673**	**1841**	**32%**	**2,642,000**	**232,590**	**164**

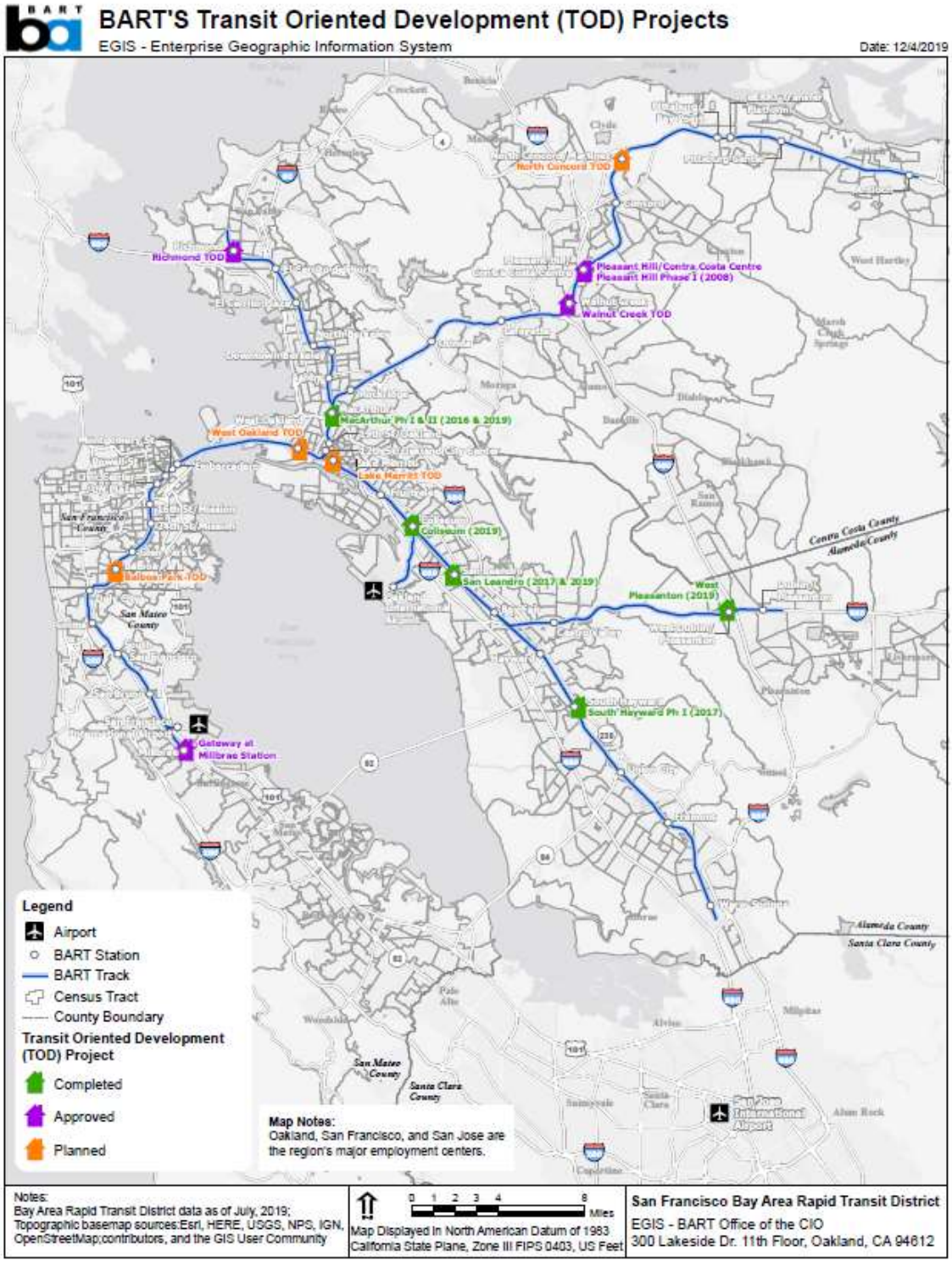
[11] https://www.bart.gov/about/business/tod

In 2016, the BART Board of Directors adopted an affordable housing policy and performance targets setting a goal of 35 percent affordable housing on its station sites which could result in an additional 7,000 affordable units over the next ten years. In addition, the BART Board also adopted TOD land use strategies, which ensure that TOD opportunities are explicitly accounted for in the acquisition of new properties, the location of new station sites, and the design and construction of station facilities. It is estimated that the TOD Policy will offset GHG emissions by 24% versus conventional development. This means that if BART produces 20,000 units on its property versus elsewhere in Alemeda and Contra Costa counties, households will drive approximately 24% less. Additionally, by supporting TOD in these areas, BART is contributing to the region's Sustainable Communities Strategy goal of reducing per capita GHG emissions in 2035 by 16 percent.

BART has played a strong leadership role as a transit agency with an interest in housing, as evidenced by BART's role on the technical and steering committees of CASA – the committee to house the Bay Area – and BART's leadership role in partnership with the Nonprofit Housing Association of Northern California to draft the CASA public lands strategy. In 2018, then-Governor Brown signed AB2923 (Chiu/Grayson), which was authored in response to BART's strong Board-adopted commitments to constructing housing on BART property. This bill establishes a process by which developable BART-owned property in Alameda, Contra Costa, and San Francisco Counties will be rezoned to support transit-oriented development, and establishes development streamlining provisions similar to SB 35. BART is in the process of implementing this historic bill, and has engaged the 22 jurisdictions affected by BART's TOD program.

These ridership increases based off current and future development are not directly modeled in this application's ridership or GHG quantification, as BART's ridership projections for the Core Capacity Program are based on constrained ridership increases. However, it is assumed that many riders from these TODs on the BART system will drive BART ridership increases, once the Core Capacity Program allows greater capacity during the peak.

Figure 2-14. Station Modernization Program: Transit Oriented Development (TOD) Projects



2.4.4.3 Attractiveness of Transit

The new rail vehicles supported by TIRCP funds will help bolster the attractiveness of transit by reducing crowding on BART trains. Overcrowding can significantly impact both train and passenger on-time performance. BART statistics show that increasing the number of passengers per car decreases train on-time performance and passenger on-time performance, as boardings take more time and some riders delay their trips to wait for a less crowded train. The new rail cars have three doors (current BART trains have only two) which decreases the time for riders to on- and off-board the trains. Efficient on- and off-boarding improves on-time performance as well as the overall customer experience.

Additionally, newly designed cars include features that make it more pleasant for people to ride, including:

- Easy to clean, wipeable seats.
- 50 percent more doors, making getting on and off the train faster and easier.
- Improved cooling system that distributes air directly to the ceilings, making it more comfortable for standees on hot days.
- Micro plug doors that seal out noise, making rides more quiet and pleasant.
- Digital displays and recorded announcements for announcing train stops and train destinations.

The new train control system will greatly improve system reliability. BART estimates that up to 40% of current system delays are due to train control issues. Better reliability results in enhanced confidence in the system which leads to increased ridership. Research has shown that travelers are more sensitive to travel time reliability than they are to travel time itself.

2.4.4.4 Expanding Existing Rail and Public Transit Systems

The Core Capacity Program expands service on the existing BART system by increasing both train lengths and frequency. The Program does not extend the existing system or expand the number of stations served by BART, but it does expand the potential ridership, as discussed in the *Primary Program Benefits* discussed above.

2.4.4.5 Connectivity, Integration, and Coordination

Please see *Section 2.4.3.3. Rail and Transit Integration* for details on connectivity, integration, and coordination with other transit and regional organization.

2.4.4.6 Clean Vehicle Technology

The newly designed rail cars are electric-powered and include state-of-the-art clean vehicle technology features. The new cars are 10 percent more efficient than those currently in service, largely due to improvements to the regenerative braking system. They are designed to be extremely lightweight, with most of the exterior constructed out of aluminum. Aluminum is abundant, does not rust, and when properly finished, reflects heat and light, keeping the train cars cool and reducing air conditioning costs. Aluminum is also lightweight but strong, and fairly easy to work with, reducing the energy investment during the manufacturing process. Additionally, aluminum is easily and readily recyclable, making it very low impact when the cars are eventually retired and dismantled. Because the new BART cars are so

lightweight (weighing 15,000–20,000 pounds less than a Washington Metro rail car, for example), they will use significantly less energy over their lifetimes.

Figure 2-15. BART Fleet of the Future Car

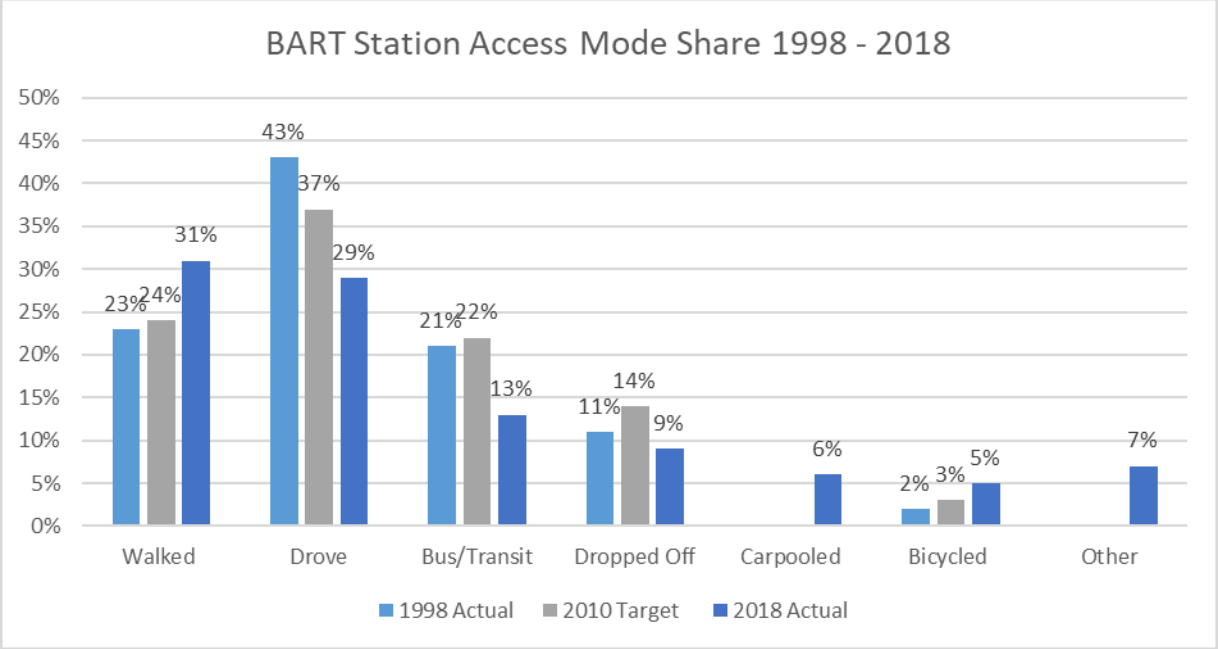
In addition to the natural heat and light reflection properties of aluminum, each car will be equipped with a white roof that will deflect heat and light away from the interior of the train. The white roof will help lessen the load on the interior cooling system, keeping passengers comfortable and decreasing energy consumption. To reduce heating and cooling energy, as well as wear and tear on the doors, the new cars will be equipped with a door sensor that will only activate if there is motion in front of the door. At the outset, this feature will be deactivated, but eventually this feature will be activated in off-peak hours. In addition, the new cars will be equipped with an LED lighting system to sense the amount of available sunlight in each car and adjust lighting intensity automatically, saving additional energy.

For more information on future renewable energy purchasing, please see *Section 2.4.4.9. Other Air Quality Impacts.*

2.4.4.7 Active Transportation

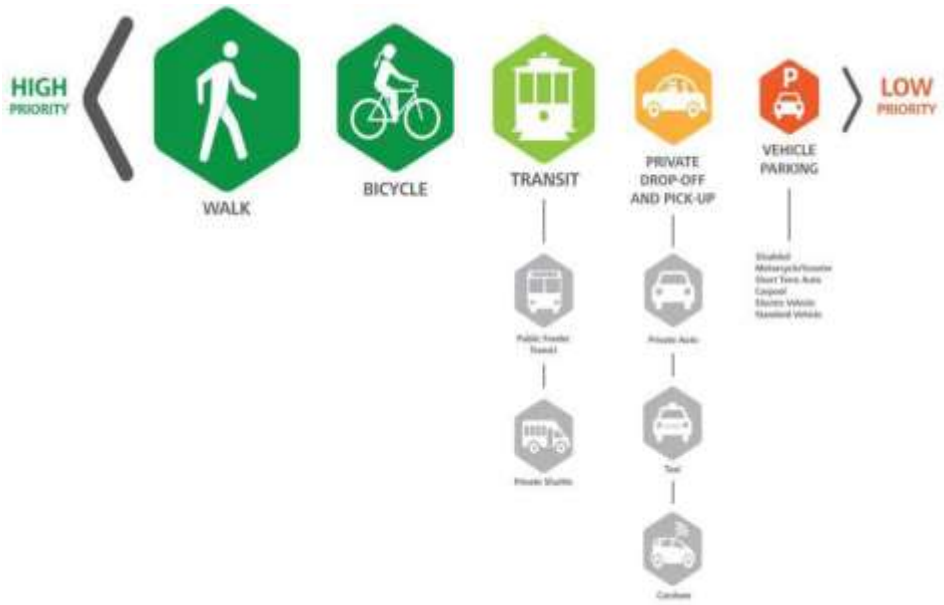
BART proactively supports projects and programs that encourage and support riders to access the BART system by walking and bicycling. BART regularly uses existing revenues and grant funds to improve pedestrian walkways, lighting and signage, and to provide secure bicycle parking at or near its stations. In 2018, over 35 percent of BART riders accessed stations by bicycling and walking (Figure 2-16). By increasing ridership, the Program will likely result in a proportional increase in bicycling/walking trips to BART stations.

Figure 2-16. BART Station Access Mode Share[12]



To encourage alternative access modes, BART has revised its Station Access Policy, which prioritizes investments to improve active transportation mode share and safety. With a clear focus on improved access, BART anticipates that the percentage of riders who use active transportation to reach BART will be even greater in the future. Figure 2-17 depicts BART's station access investment priorities, with walking and bicycling receiving the highest investments of all access types.

Figure 2-17. BART Station Access Investment Priorities



[12] 2018 data per 2018 BART Customer Satisfaction Study

In addition, the newly designed train cars include bicycle storage areas, making it easier for riders to get to their destinations by bicycle once they have arrived at their stop. This improvement will help facilitate growth in bicycle station access.

2.4.4.8 Improve Public Health

The Core Capacity Program will improve public health by increasing ridership and improving regional air quality. By making BART service more comfortable, reliable, and convenient, the Program will support ridership growth that displaces automobile travel. Reducing the number of miles driven by vehicles in the Bay Area improves air quality by reducing criteria pollutant emissions, which will improve respiratory health and other impacts throughout the region. Reductions in criteria pollutants is particularly important for communities located along high-traffic roadways. Since 30 percent of BART stations are located within a disadvantaged community, and many more stations serve DACs (are within a half mile), the public health benefits of the Program are largely concentrated in these areas.

Overall, the increase in BART riders accessing the stations by modes other than automobile supports an active lifestyle. Please see *Section 2.4.3.1 Reduction of Greenhouse Gas Emissions* for details on quantified GHG emissions benefits and reductions in VMTs due to the Core Capacity Program.

2.4.4.9 Other Air Quality Impacts

Overall, BART is working diligently to decrease the GHG emissions of its system primarily through sourcing the electricity portfolio needed to run the system to more zero or low-carbon sources. Specifically, GHG benefits realized by the new 306 vehicles and CBTC system (funded by TIRCP) will be amplified by BART's separate efforts to decrease GHG emissions from the existing system.

BART's wholesale electricity portfolio policy can be found in *Appendix H. BART Strategic Energy Plan* and zero and low carbon sourcing is already underway. In 2016, about 27% of BART's contract power was zero or low carbon as compared to 13% in 2015. Because of this increase in power purchasing from zero or low carbon sources, BART generated 119,795 MT CO2e of emissions (or 1.61 kg CO2e/BVM) in 2016, a decrease of 7.7% from 2015 unnormalized.

While most transit agencies receive their power from local utilities under standard rates, BART has statutory authority to procure its own power supply. BART has adopted a Strategic Energy Plan that includes renewable energy procurement goals of 75 percent by 2017 and 100 percent by 2020. Please see *Appendix H* for BART's Strategic Energy Plan.

BART has recently signed two important agreements for procuring its energy supply. The first agreement is with NextEra Energy for energy generated from a new 61.7 MW wind project location in Kern County, California. The second agreement, with Recurrent Energy, will supply energy generated from a new 45 MW solar project also to be located in Kern County, California. In the near term, these projects will meet approximately 90% of BART's energy needs when they come online in 2021. As BART's energy needs increase between 2021-2026, due to the addition of new services and the upgraded train control system, the projects will then meet approximately 75% of BART's energy needs. In the long term, these

agreements will put BART well on the path of achieving 100% of its electric power from eligible renewable sources by 2045.

2.4.5 Benefit to Priority Populations

See *Section 2.6 Disadvantaged Communities, Low Income Communities, and/or Low Income Households* for detailed information on project benefits to priority populations

2.4.6 Consistency with Plan Bay Area 2040

As stated previously, The Metropolitan Transportation Commission (MTC) adopted an update to its Regional Transportation Plan, Plan Bay Area 2040, on July 26, 2017. The update includes the capital projects and service assumptions that make up the Transbay Corridor Core Capacity Program. Hence, the Core Capacity Program is consistent with the Bay Area's Sustainable Communities Strategy (Plan Bay Area 2040).

2.4.7 Non-TIRCP Funding

The Core Capacity Program and the 306 Vehicles are funded through a variety of funding sources, including BART funds, local funds, state funds, and federal funds. For detailed description of funding sources, see *Section 3.2.7. Funding*.

2.4.8 Tracking and Reporting Metrics

According to the most recent California ARB's Funding Guidelines[13], CalSTA is required to report on project outcomes for all TIRCP projects. As such, BART will provide tracking information for both 2018 and 2020 TIRCP Scope components, vehicle purchases and the new CBTC system.

The Core Capacity TIRCP Scope includes projects that cover both "Capital Improvements that Result in New or Expanded Transit Service or Increase of Mode Share on Existing Transit Service" as well as "New Vehicles for Existing Transit Service." Table 2-8 outlines the metrics and reporting methods that BART will undertake as a part of TIRCP funding requirements.

Table 2-7. TIRCP Scope Metrics and Evaluation

Project	Metric	Unit	Evaluation Method
Vehicles	Tracking dates of data submission	mm/dd/yyyy	N/A
	Fuel/energy consumption or vehicle miles traveled	Gallons/year by fuel type, kWh/year, scf/year, or vehicle miles traveled/year	Evaluation of fueling, utility, mileage, or other operating records
	Change in fuel/energy consumption or annual vehicle miles traveled		

[13] https://www.arb.ca.gov/cc/capandtrade/auctionproceeds/2017_draft_funding_guidelines.pdf

2.5 Program Impacts

The following section describes how the Core Capacity Program could impact other transit services and other potential projects in the corridor.

For a full discussion of the Program's benefits and specifically how the BART Core Capacity Program will be tied into planned high-speed rail access, please see *Section 2.3 Program Benefits.*

2.5.1 Program Impacts on Other Transit Services

The Core Capacity Program will not impact the operation of other transit services, with the possible exception of the construction related to the additional 5 traction power substations (TPSS). See *Statement of Work* for more details on the TPSS. The installation of the TPSS at the BART Civic Center Station has the potential to temporarily impact MUNI light rail services in the Market Street tunnel. During the design phase, BART will work closely with MUNI to avoid and/or mitigate any service impacts due to this construction. The TPSS at Civic Center Station is not included in the TIRCP scope for the Core Capacity Program.

2.5.1.1 Other Transit Services – Ridership Increases

Because the Core Capacity Program is expected to increase ridership throughout the system, it will have a positive impact on the ridership numbers of connecting transit services. As part of the ridership modeling included in this application, combined ridership on multiple Bay Area transit systems will increase by 65,800 riders annually because of the Core Capacity Program.

The ridership changes from other Bay Area transit systems, because of the Core Capacity Program, were projected based on the Metropolitan Transportation Commission's (MTC's) Travel Model One forecast. Travel Model One is an Activity Based Model (ABM) covering the 9-county San Francisco Bay Area, which is used to simulate travelers' reactions to transportation projects and policies in the region, as well as to quantify the impact of cumulative individual decisions on the Bay Area's transportation networks.

Travel Model One was run for two scenarios: 2020 No-Build and 2020 Build (Core Capacity Program is implemented). In the No-Build scenario, the model is run as it is. In the Build Scenario, it is assumed with the Transbay Core Capacity Program in effect, the BART lines that use the Transbay Tube will run at increased frequency during AM peak and PM peak periods. This results in increased BART Transbay ridership and changes in ridership in the rest of the Bay Area transit systems.

For a detailed methodology and results of this Bay Area Ridership Analysis, see Appendix C. Ridership Modeling Methodology.

Please see *Section 2.4.3.3 Rail and Transit Integration* for more information on connections to other transit systems, including the multiple connections with the planned California High-speed Rail system.

2.5.2 Program Impacts on Planned Projects

The Core Capacity Program will not impact other planned or underway projects within the Bay Area. VTA's project to extend BART to San Jose and Santa Clara will utilize fully compatible vehicles and the same train control system to allow for a seamless operation.

2.6 Disadvantaged Communities, Low Income Communities, and/or Low Income Households

The many disadvantaged communities (DACs), low income communities, and other minority or at risk communities located along the BART system will benefit from the increased frequency, greater capacity and reduced crowding gained from the Core Capacity Program. This section provides an overview of these benefits, while *Appendix D. Outreach to Disadvantaged and Low Income Communities* describes outreach to these communities in detail. Additionally, *Appendix I. BART Rider Demographics* details the demographics of BART users in detail.

2.6.1 Qualifications for ARB Funding

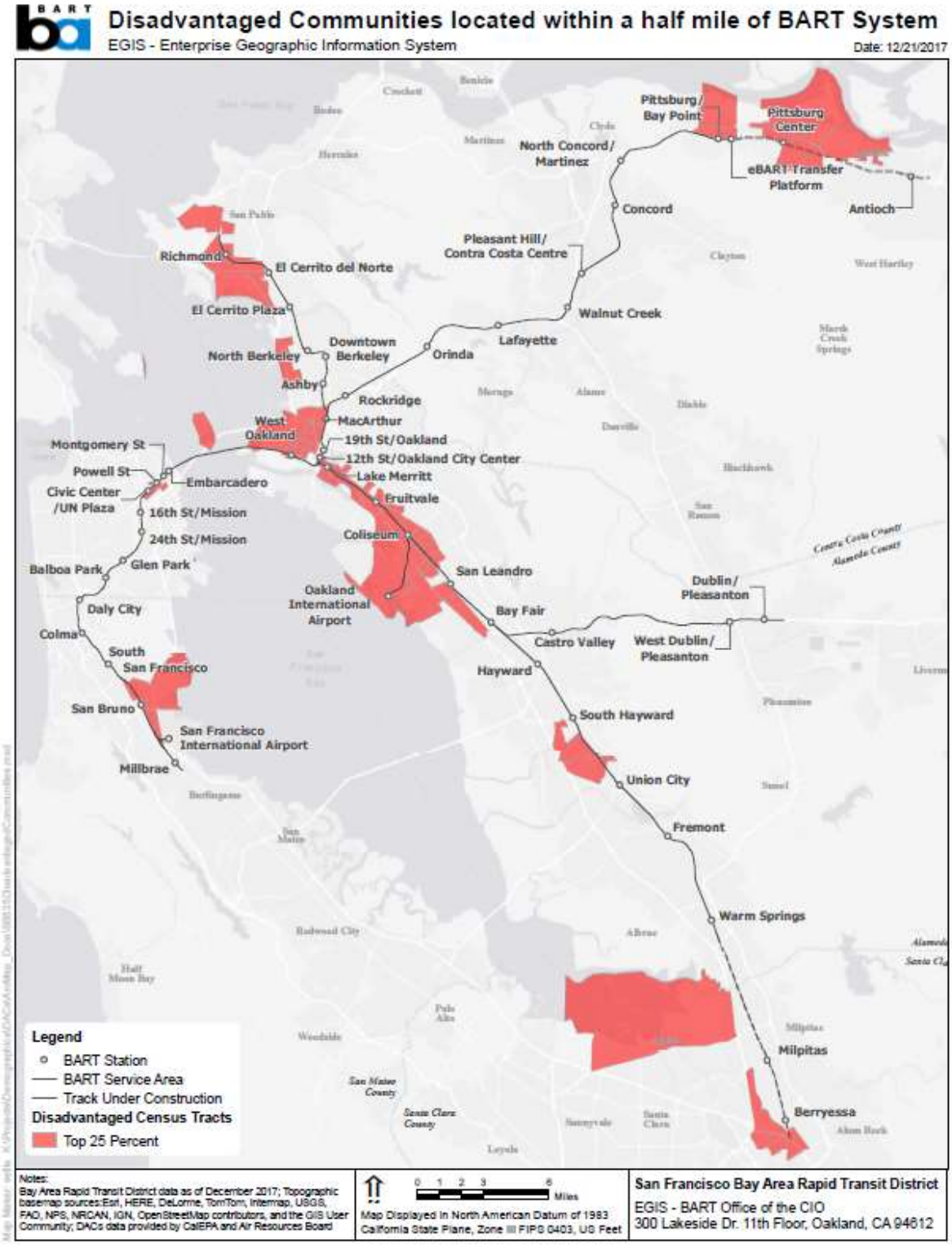
According to the California Air Resource Board's Funding Guidelines[14], the Core Capacity Program is classified as a Transit project, as it will achieve GHG reductions by reducing passenger vehicle miles travelled (VMT) through operational improvements, including increased service frequency and safety. Additionally, the Core Capacity Program qualifies for ARB funds because of the following criteria:

- The Program serves multiple disadvantaged communities along the BART system. See Figure 2-18 for a map showing DACs along the BART alignment.
- BART has and will continue to host community meetings, as part of the planning process to engage local residents and community groups for input on community and household needs, and will continue to provide documentation showing how the input will be considered and addressed.
- The Program provides improved transit service for stations and stops within multiple AB 1550 communities on the BART system.

Specifically, designated disadvantaged communities located along/within a half mile the BART line and to the Core Capacity Program can be seen in Figure 2-18. The Core Capacity Corridor includes 9 BART stations located directly within disadvantaged communities. Additionally, for the most overburdened section of the Core Capacity corridor from West Oakland to Embarcadero Station, the West Oakland Station is also located in a disadvantaged community. In total, at least 15 of the over 50 existing and planned BART stations are in disadvantaged communities. This is equal to 30% of all stations.

[14] https://calsta.ca.gov/-/media/calsta-media/documents/tircp-2020-final-guidelines.pdf

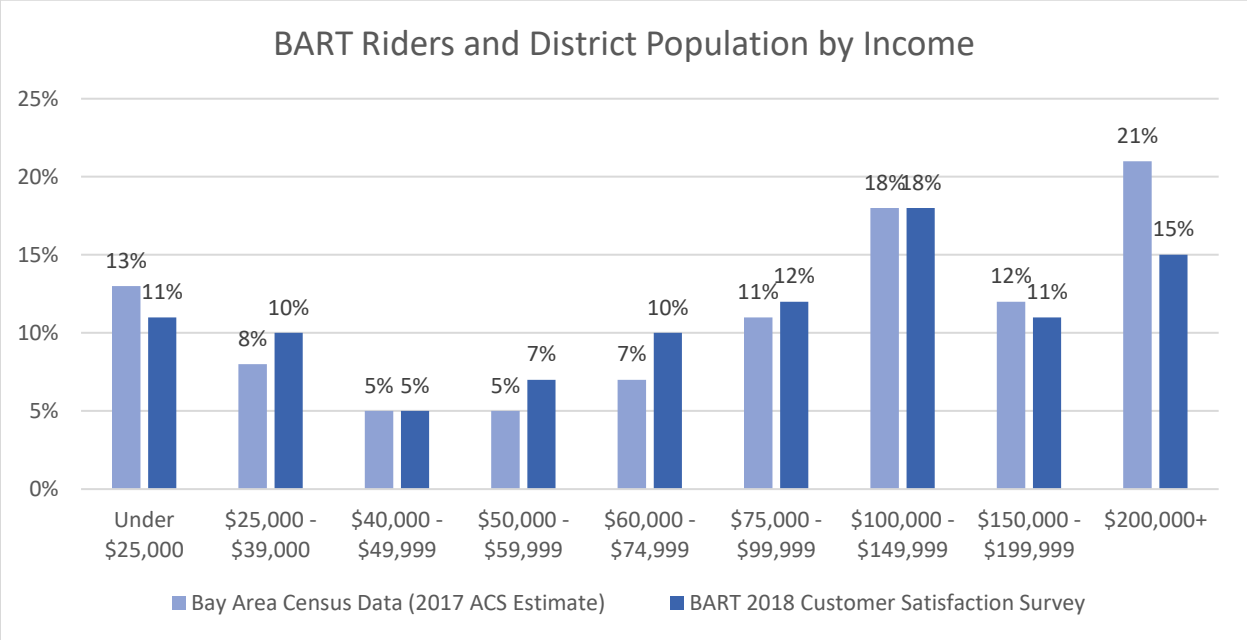
Figure 2-18. Disadvantaged Communities located within half mile of BART System



2.6.2 Program Benefits to Disadvantaged or Low-Income Communities

BART riders come from across the income spectrum and from the full diversity of the region's racial and ethnic groups in rough proportion to their representation in the population of the BART district as a whole (Figure 2-19). Additionally, BART offers an essential travel option for people with disabilities, for youth and seniors, for those living in households without access to a car, and for whom daily driving would be an unaffordable expense. As the spine of the regional transit system, BART helps to make the Bay Area more affordable for lower-income households and is accessible to all. For more information on BART's impacts, please see Appendix E. Role of BART in the Region.

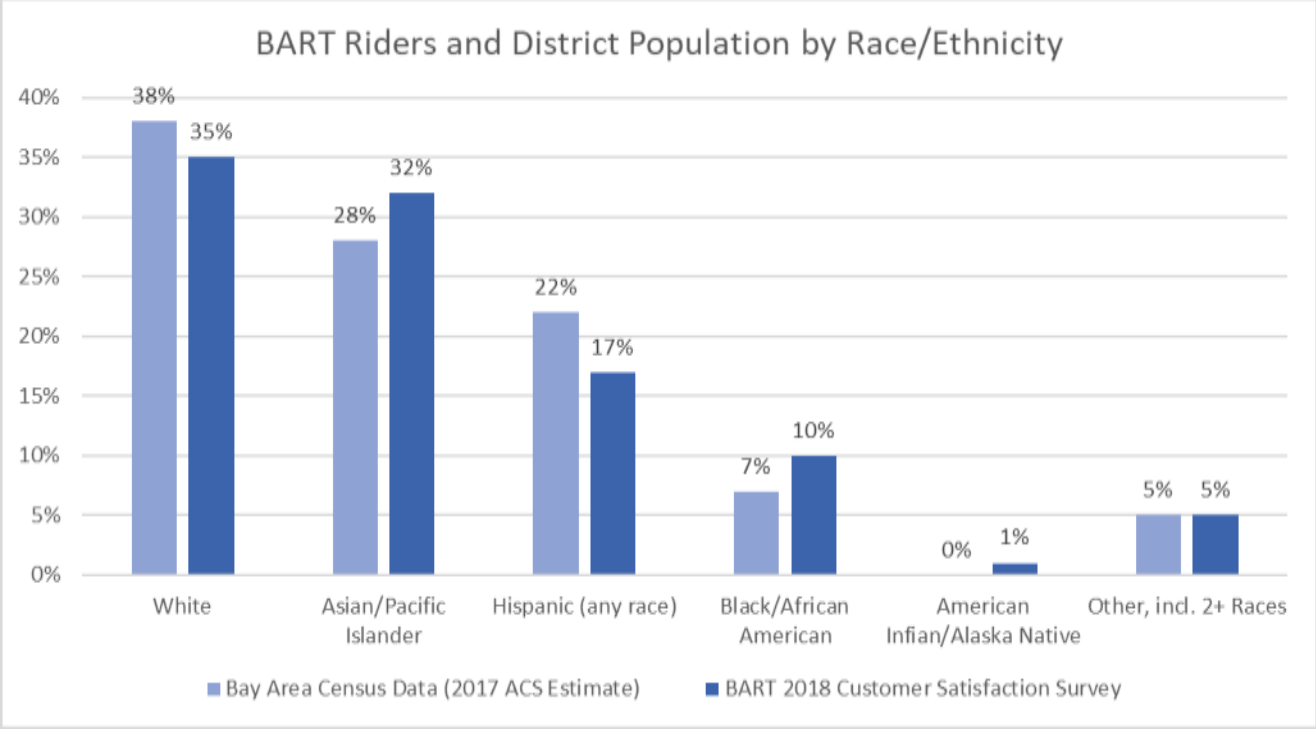
Figure 2-19. BART Riders and District Population by Income[15]



Likewise, riders are as racially and ethnically diverse as the Bay Area's population. By serving diverse populations, BART helps to knit the region together as one community. Figure 2-20 compares the racial/ethnicity composition of the region (based on 2013 data) with that of BART riders (based on BART's 2014 Customer Satisfaction Survey), showing that they are very similar.

[15] BART data per 2018 Customer Satisfaction Study

Figure 2-20. BART Riders and District Population by Race/Ethnicity



BART has a long and successful history of interacting and working with social justice, environmental, community-based, faith-based, disability rights and other groups in the BART service area. BART has solicited input and sought ideas on a wide variety of both programs and projects – from the design of new rail cars, to station area improvements or development, to changes in fares and their potential impact. BART has successfully implemented several community-based grants such as Caltrans' Environmental Justice grants, MTC's Community-based Transportation Planning grants, as well as the successful Better BART outreach campaign in 2016.

BART's outreach efforts are designed to ensure meaningful access and participation by minority, low income, and Limited English Proficient (LEP) populations and the two projects included in the Core Capacity Program provides benefits to these groups.

Figures 2-21, 2-22, and 2-23 show the direct overlap of LEP communities, minority populations, as well as Low Income Communities with the BART system.

Figure 2-21. Limited English Proficiency (LEP) Population and BART System

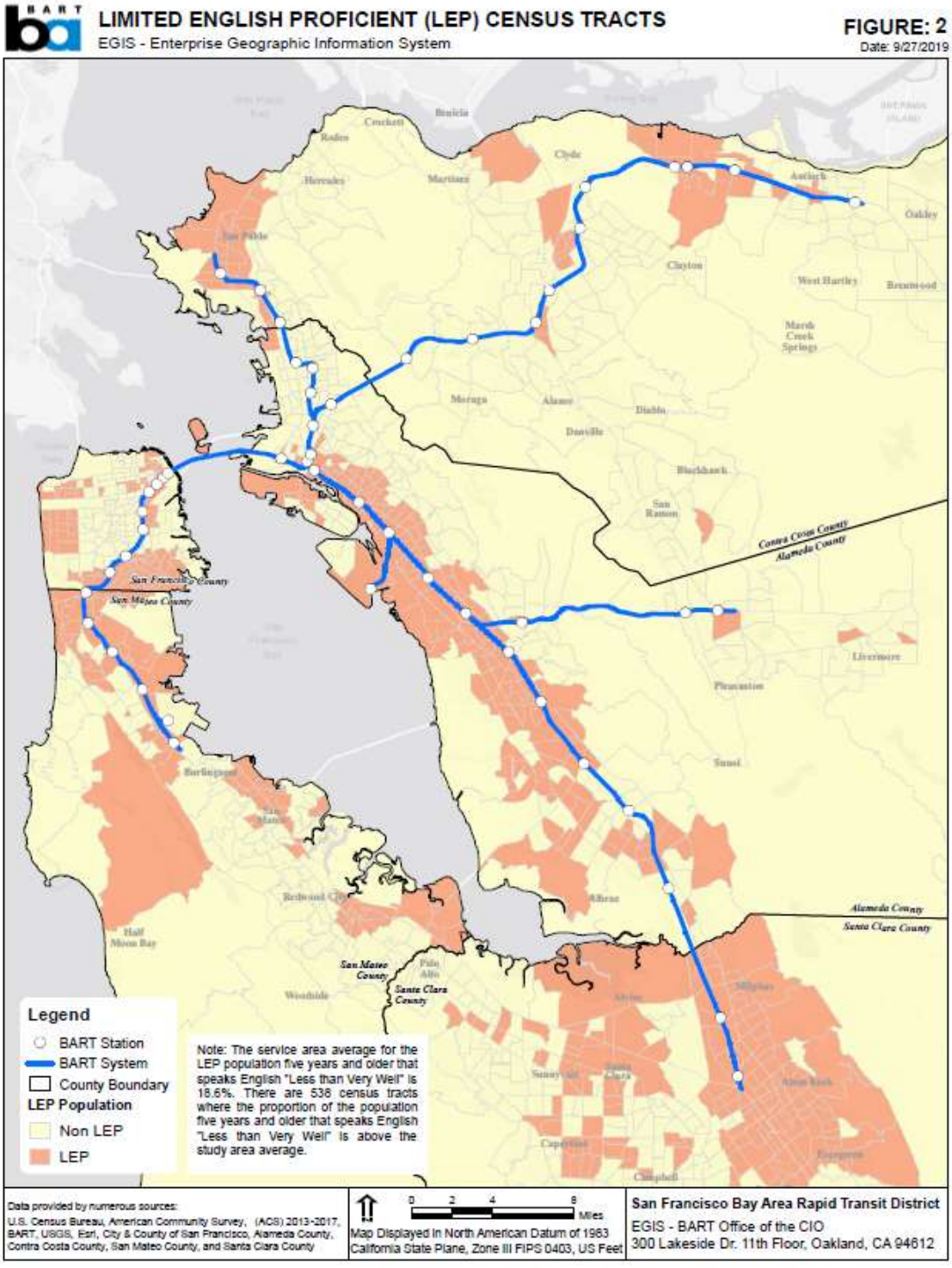
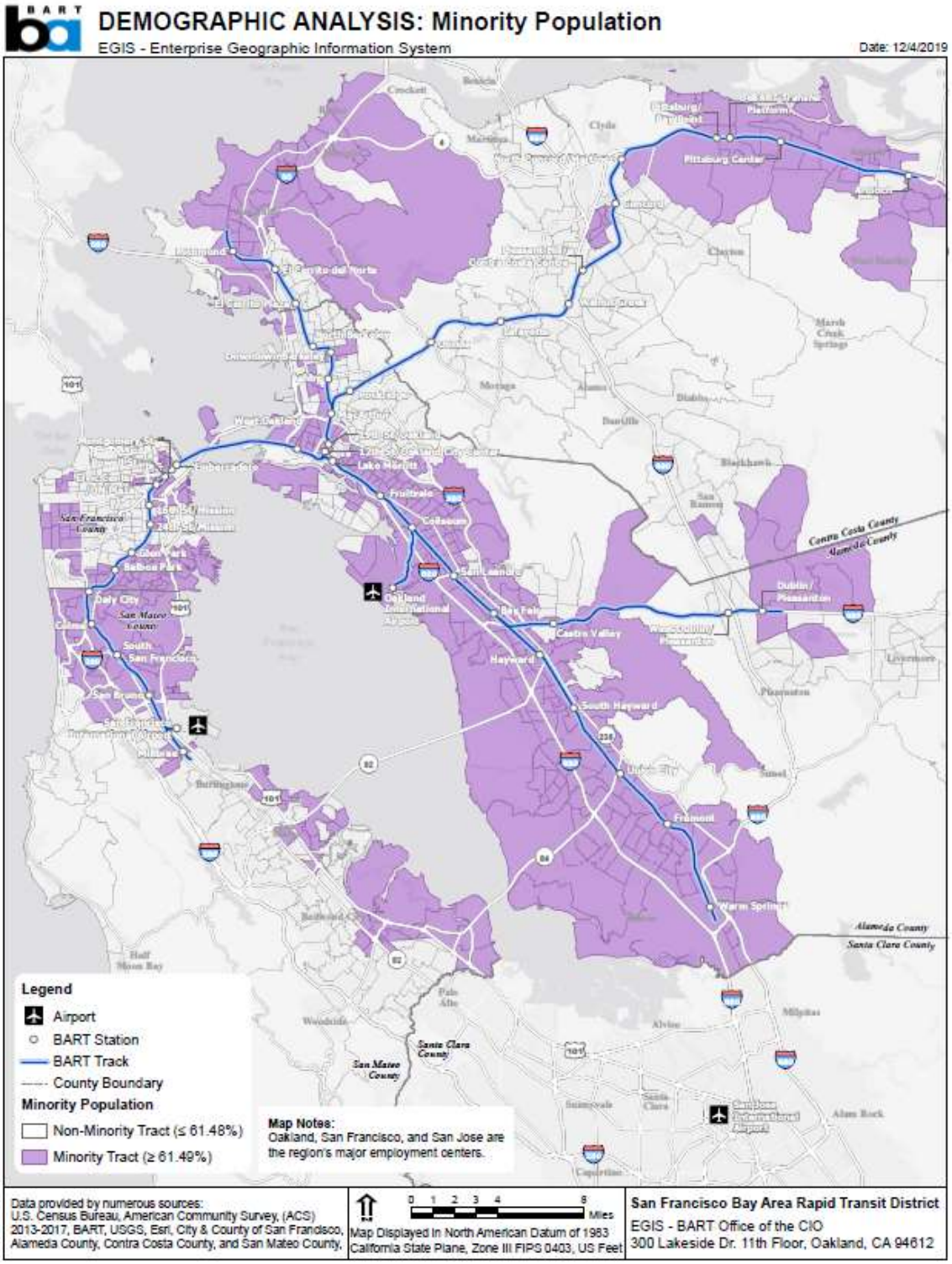


Figure 2-22. Minority Population and the BART System



2.6.3 Summary of Outreach to Disadvantaged Communities

BART's Public Participation Plan (PPP) was developed in 2011, with an update in 2015, and followed extensive outreach throughout the BART service area and guides the organizations ongoing public participation endeavors (*Appendix J*). The PPP ensures that BART utilizes effective means of providing information and receiving public input on transportation decisions from low income, minority and limited English proficient (LEP) populations.

As recommended in the PPP, BART has implemented a variety of outreach techniques for projects related to the Core Capacity Program. In 2014, BART launched its "Fleet of the Future" outreach campaign to obtain public feedback on the design of BART's new vehicles. A series of ten events were held at BART stations and in local communities throughout the San Francisco Bay Area. Approximately 17,500 people attended the events and a total of 7,666 surveys were collected. BART staff consulted regularly with members of the disability community including its the BART Accessibility Task Force (BATF), on the design and functionality of the new BART trains. The BATF provided hands-on feedback on all aspects of the car design.

Outreach related to the 2014 BART Vision Plan engaged over 2,000 people in exploring the tradeoffs involved in considering how BART can meet its future needs. The public helped BART staff narrow down future projects and investments BART should focus on by determining which ones are most important to the public and fit best into BART's goals of serving the Bay Area for years to come. A total of ten in-station events were held and a total of 2,551 surveys were collected.

BART's Title VI/Environmental Justice Advisory and Limited English Proficiency Advisory committees meet regularly to assist BART on all issues of policy with a focus on meeting the needs of minority and disadvantaged communities and riders. In November 2017, both committees received a presentation on the Core Capacity Program.

In 2017, BART also partnered with MTC to conduct outreach on its Core Capacity Transit Study (*Appendix G*), a collaborative effort to improve public transportation to and from the San Francisco core. Outreach activities consisted of two public meetings to identify investments and improvements to increase transit capacity to the San Francisco Core. Approximately 80 people participated in the public meetings.

2.6.3.1 Outreach to Disadvantage or Low-Income Communities

- The PPP outlines strategies to engage disadvantage and low-income communities, including: Translation of flyers and other meeting materials and interpretation services
- Outreach to Community Based Organizations (CBOs)
- Providing notification using Ethnic Media
- Hosting meetings in accessible locations

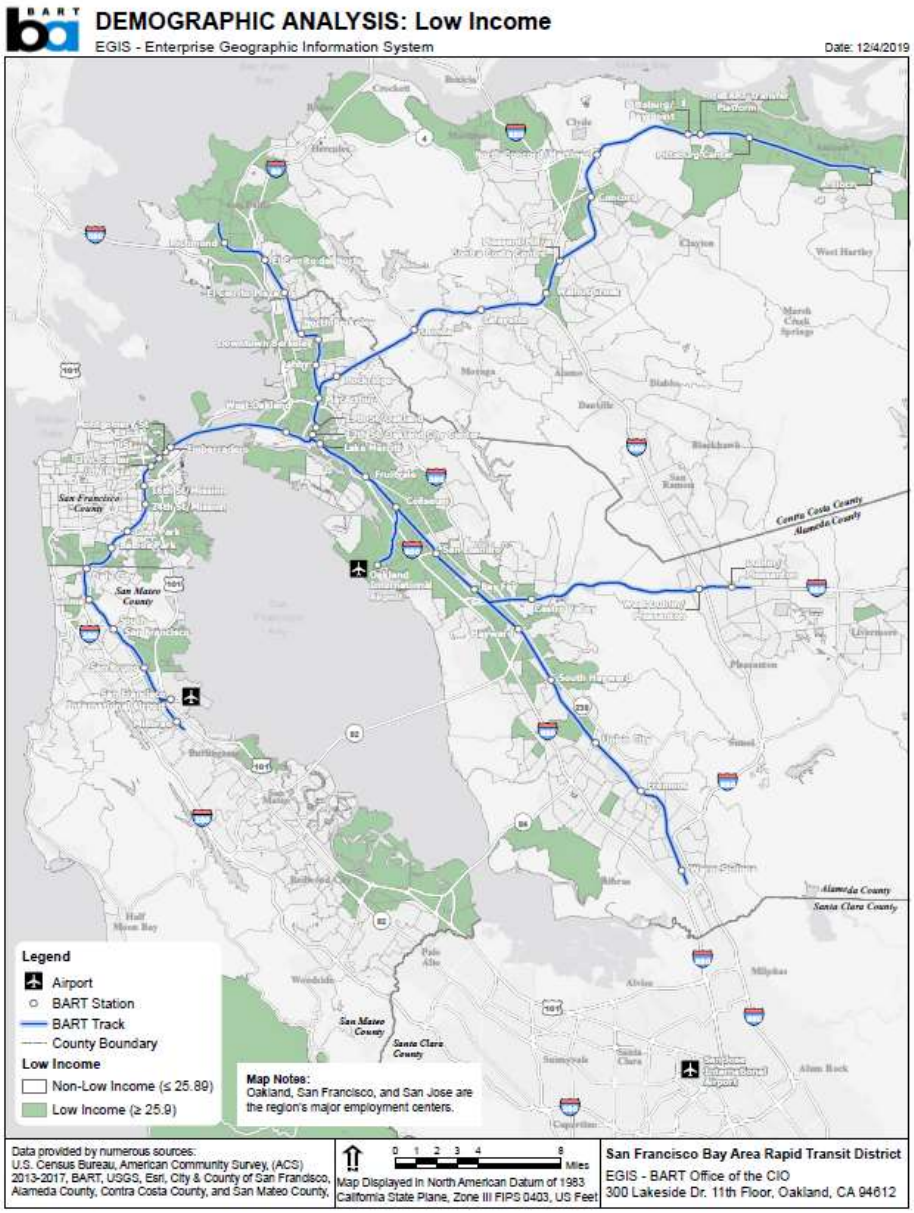
2.6.3.2 Additional Outreach Activities

Appendix D. Outreach to Disadvantaged and Low Income Communities provides a detailed overview of public outreach activities undertaken by projects under the Core Capacity Program from 2010 – 2017.

Outreach activities include:

- Fleet of the Future New Train Car Model
- BART Vision – Future BART
- Embarcadero-Montgomery Capacity Implementation and Modernization Study
- Better BART
- MTC Plan Bay Area 2040
- MTC Core Capacity Transit Study
- Hayward Maintenance Complex Noise Study

Figure 2-23 Low-Income Tracts and BART System



2.6.4 Proposed Additional Outreach to Disadvantaged and Low Income Communities

Because of BART's extensive community work, BART is in an excellent position to implement a new round of outreach, specifically focused on garnering input on the changes proposed by the BART Core Capacity Program in its entirety, and to measure potential impacts, both positive and negative, on the increased capacity achieved by this Program as well as any impacts caused by construction activities.

Included in this application for state funding, BART proposes to implement a $250,000 outreach program working directly with community-based organizations in key Disadvantaged Communities (as identified by the CalEnviro Screen 3.0) located within BART station areas or along BART lines. BART proposes to pass through a portion of these grant funds directly to 4-5 local community-based groups to conduct outreach meetings, workshops and focus groups that will provide input on potential local impacts of the project. The targeted DACs could include the communities of South Hayward, Richmond, Antioch, San Bruno, Oakland Coliseum and West Oakland, as illustrated on Figure 2-18.

To maximize the participation of community members, BART will work with the selected local community groups to structure the meetings and focus groups in a such a way as to meet the needs of the participants. For example, meetings may be held in the evening or on a weekend, and babysitting services and culturally appropriate food and drink may be provided. In all cases, translators and materials in a variety of languages will be provided. BART proposes to allow the local community groups with which it engages to take the lead on determining the best and appropriate methods for engaging their communities.

To augment this outreach, BART proposes to provide survey instruments to gather input from BART riders and members of the public to solicit further input on this project. This survey could take the form of paper and/or online surveys. As is routine, BART will provide this survey in multiple languages.

In addition, BART will use its significant media network to advertise community meetings and workshops as well as the survey. BART utilizes in-station messaging, media advisories, direct mail and email, and social media to inform and involve residents, riders and the public. The following details the preliminary budget for the post-award outreach activities.

Table 2-8. Outreach Program Cost

Outreach Program Component	Cost
Grant pass through ($20,000 for each of 5 groups or $25,000 for 4)	$100,000
Materials (surveys, translations, other media, etc.)	$90,000
Program oversight (legal review, contract administration)	$50,000
Draft/Final report	$10,000
Total	**$250,000**

Table 2-9. Outreach Program Schedule

Outreach Program Component	Schedule
Finalize program design	Summer 2020
Contact community groups/set up pass through agreements	Fall 2020 – Winter 2020
Develop materials	Spring 2021
Conduct workshops, focus groups and surveys	Summer 2021 – Fall 2021
Assess outcomes/prepare draft report	Winter 2021
Issue Final Report	**Spring 2022**

2.6.5 Employment and Workforce Development and Training Benefits

Bombardier, the Canadian company under contract to complete the initial 775 cars that are BART's "Fleet of the Future" has opened a new facility in Pittsburg, California to complete this order, as well as future work in California and the west coast. BART is currently in negotiations with Bombardier for the 306 Vehicles discussed in this application.

This move by Bombardier, because of this large contract with BART for rail vehicles, will create economic opportunities for the Bay Area region by building the manufacturing facility and then staffing the facility. Bombardier currently has nearly 500 employees in California, working on projects beyond the current BART order of 775 vehicles. Bombardier employees are operating and maintaining the AirTrain system at San Francisco International Airport, maintaining the commuter rail car fleet for the Metrolink service at the Southern California Regional Rail Authority, and operating and maintaining the Coaster and Sprinter rail services for the North County Transit District. Bombardier is also in the early stages of bringing a new automated people mover system to Los Angeles International Airport.[16] Bombardier's presence in the region will only grow with this additional investment in the assembly plant. It has been reported that about 50 people currently work at the plant, and expect that number to rise to about 115 as the plant ramps up.

Bombardier's decision to locate this new manufacturing facility in the Bay Area is only possible with BART's large contract, and continued support to move forward with the sole source contract currently being negotiated.

2.6.6 Data Gathering and Analysis

BART, like other transit agencies, makes much of its data public on the website BART.gov, including ridership and annual Customer Satisfaction Surveys, and much more. There will not be any new data provided through the Core Capacity Program implementation than what BART already provides for public use and benefit.

[16] https://www.bombardier.com/en/media/newsList/details.bt-20190614-bombardier-announces-expansion-of-its-u-s--footprint.bombardiercom.html

2.7 BART Management Capability

Since the 1950s when planners, politicians and engineers designed and built the original BART system, BART has amassed a proven track record of successfully delivering large-scale, complex projects, including system extensions, new stations to existing lines, a billion-dollar earthquake safety retrofit projects, major system upgrades, and other state-of-good repair projects.

As a recent example, in March of 2017, BART service was extended south 5.4 miles from the Fremont Station to a new station in the Warm Springs district of Fremont in southern Alameda County (the "Warm Springs Extension"). The Warm Springs Extension alignment is mostly at-grade; however, it runs beneath Fremont Central Park in a mile-long cut and cover subway. The project funding plan for the $890 million extension included substantial contributions from a variety of local and State sources and surplus revenues from the SFO Extension. The project had no federal funding. The project was implemented via two major contracts: the $137 million Fremont Central Park Subway contract which was begun in August 2009 and completed on schedule and within budget in April 2013 and the $299 million design-build Line, Track, Station and Systems ("LTSS") contract which was begun in October 2011. The project was completed approximately $100 million under budget.

BART has also successfully added new rail services using non-BART technology, further demonstrating the agency's engineering and project management expertise. Both the Oakland Airport Connector (opened in 2014) which provides rail service from the Oakland Coliseum BART station to the Oakland International Airport, and a new rail service extension called the eBART/East Contra Costa Rail Extension (opened in May 2018) which extends ten miles from the Pittsburg/Bay Point BART line to the City of Antioch, and operates using non-BART technology (cable-propelled people mover, and diesel multiple unit, respectively).

2.8 Program Implementation and Management

As a rail provider for over 40 years, BART has fully demonstrated its capacity, knowledge and skills to successfully deliver highly complex, major construction and procurement projects. BART will manage the Core Capacity Program using an integrated approach that makes use of BART's existing organization and specialized skills and resources to deliver each Program element while integrating the relevant components, delivery schedules, funding streams, testing and commissioning requirements, and maintenance and operation considerations.

A centralized Program Management Team has been established and will have the following functions:

- Program controls and monitoring
- Program coordination among the four Program elements
- Program funding and funding timelines

A Program Management Coordinating Committee (PMCC), consisting of the Program Management Team and the project managers for each element, meets regularly (currently weekly).

Delivery of each individual element will be the responsibility of separate Project teams, one for each element. Each Project team will establish the appropriate delivery mechanism for its element in coordination with the management framework and schedule established for the overall program. The elements will be delivered by separate contracts. Tentative decisions on delivery method are:

- Vehicles: Negotiated procurement
- HMC Phase 2: Design-bid-build
- CBTC: Design-build
- TPSS: Five new TPSS will be delivered by contractors hired as part of BART's traction power refurbishment program. A sixth TPSS, within the HMC Phase 2, will be delivered by the contractor delivering the HMC storage facility.

The BART divisions most directly involved in delivery are:

- Planning, Development and Construction (PD&C)
- Operations, primarily Rolling Stock & Shops,
- Maintenance & Engineering (M&E)

PD&C will be responsible for delivering two elements – HMC Phase 2 and CBTC. M&E will be responsible for delivering the traction power project element. Rolling Stock & Shops will be responsible for the vehicles element. Ancillary departments at BART will provide support throughout design, procurement, construction, manufacturing, delivery, and testing.

Recurring meetings and regular reports will be used to track, communicate and resolve issues as they arise. Program reporting will include the communication of scope, time, and cost requirements to management and appropriate members of the delivery team in accordance with the Program controls framework.

Regular reporting for the program and each Program element will use existing web-based project and financial management tools such as PeopleSoft and Oracle Business Intelligence Enterprise Edition (OBIEE). PMs can develop progress report data once a project is initiated in BART's online database. The format and content of these reports is set by each Assistant General Manager (AGM) and may differ by department.

Program Contracting & Contract Oversight: BART follows federal guidelines on all procurement processes, from contractors to equipment, as laid out in its detailed Procurement Manual. The manual explains delegation of authority, legal review requirements, procurement protests, and other contract oversight. This Manual can be provided upon request.

Change-order Management: All executed construction contracts under BART shall contain requirements regarding contract adjustments in the contract general provisions. Approval authority and limitations established by the District act and by the Board of Directors are explained in detail under BART's Delegation of Authority Management Procedure.

Risk Management: BART has implemented a risk management strategy for the program that establishes a formal, systematic approach to identifying, assessing, evaluating, documenting and managing risks that could jeopardize the success of the project.

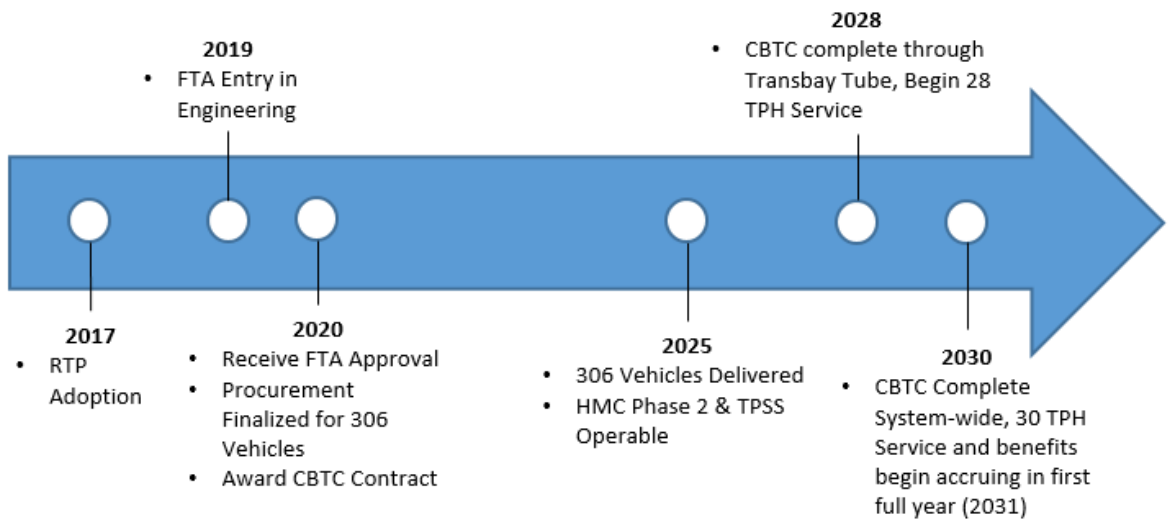
Upon request, BART can provide a Program Management Plan as well as a Risk and Contingency Management Plan for further details.

2.9 Program Readiness

The overall Core Capacity Program is currently at 65% design and the CEQA and NEPA processes have been completed. The procurement process for CBTC is underway, with BART currently reviewing responses to a Request for Proposals (RFP). Final vehicle specifications will match the previous batches of delivered cars, and will be completed expeditiously, with an agreement with Bombardier expected in July of 2020.

The Program has been sequenced to deliver all four component projects concurrently to minimize the overall Program duration and bring the Program benefits to fruition as quickly as possible. As shown in Figure 2-24, CBTC contains the longest schedule duration in the Program. Accordingly, the Program critical path extends through the CBTC implementation schedule.

Figure 2-24. Core Capacity Program Delivery Schedule Summary



The Core Capacity Program will be complete system-wide by 2030 and will be fully running 30 trains per hour by 2031 through the Transbay Tube. BART is expecting to give notice to proceed (NTP) to a CBTC supplier in Spring 2020. The actual delivery schedule will be negotiated as part of that contract negotiation. The 306 cars will be delivered by 2025, and the CBTC schedule anticipates that the CBTC system will be ready to demonstrate 28 train per hour (TPH) capacity through the Transbay Tube by 2028 and begin 30 TPH peak service by 2031. By the time 30 TPH Transbay service is achieved, the new order of 306 additional vehicles will be delivered, HMC Phase 2 will be completed, and the new traction power substations will be operational.

The program schedule also shows that BART is currently receiving a delivery of 775 replacement and expansion vehicles.

For a detailed look at the entire Core Capacity Program timeline, please see *Section 3.2.4 Program Schedule.*

2.9.1 Environmental Review

In September of 2017, BART received confirmation that its Core Capacity Program qualified for a Categorical Exclusion (CE) from NEPA. The September 2017 CE confirmation letter from FTA is found in *Appendix K*. *Categorical Exclusion*. The rail vehicle acquisition, traction power improvements and CBTC system are statutorily exempt from the California Environmental Quality Act, and the BART Board adopted the project and certified the statutory exemption in November 2016. HMC Phase 2 was cleared through CEQA with a Negative Declaration (2011) and two addenda to the Negative Declaration (2013 and 2016).

2.9.2 Agreements with Key Partners

The TIRCP Scope components, additional cars and the CBTC system, do not require any third-party involvement to begin implementation. Both the additional traction power stations as well as the vehicle storage facility will require some coordination with key partners. These partners and their applicable agreements are show in Table 2-10.

Table 2-10. Agreements with Key Partners

Program Element	Third Party	Agreement, Coordination, Permit	Anticipated Date of Agreement or Permit
Traction Power	SFMTA	Coordination	Existing Maintenance Agreement
Traction Power	Caltrans	Agreement	Existing
Traction Power	Caltrans	Agreement	May 14, 2019
Traction Power	Caltrans	Agreement	December 2019
Traction Power	Caltrans	Agreement	December 2019
Traction Power	Caltrans	Agreement	Dec 2021
Traction Power	Caltrans	Agreement	Existing Maintenance Agreement

2.9.2.1 Program Funding Partners

The implementation of BART's Core Capacity Program will involve funding from several federal, state and local partners. Please see *Section 3.8 Funding* of the *Statement of Work* for detailed descriptions of each Funding Partner.

3 Statement of Work

The following *Statement of Work* provides additional detail on the Core Capacity Program, and specifically the TIRCP Scope. Some of the information in this section is covered in the *Program Narrative* above, however, is copied again below for completeness.

The following Core Capacity Program documents can be made available upon request:

- Capital Cost Methodology and Estimate Report
- Basis of Schedule Report
- Financial Plan
- Project Management Plan
- Conceptual Engineering Documents

3.1 About BART

The BART system currently consists of 122 route miles of heavy rail transit serving 48 stations in San Francisco, in the East Bay, and on the Peninsula. The existing system operates as five lines designated by different colors – Yellow, Green, Red, Orange and Blue. Four of these lines – all but the Orange Line – merge into a single double-track alignment connecting San Francisco and Oakland through the Transbay Tube.

The Transbay Corridor Core Capacity Program is a comprehensive and coordinated package of investments that will increase capacity between San Francisco and the East Bay by more than 30 percent. The program will allow BART to operate 30 ten-car trains per hour on the main trunk of the existing system, between Daly City and the Oakland Wye, maximizing throughput in the most heavily used part of its system.

BART currently operates a maximum of 23 trains per hour in the peak direction on the main trunk of the system, from the Oakland Wye to Daly City, with train lengths averaging 8.9 cars per train. Peak period peak direction trains are crush-loaded, and the program goal is to reduce the level of crowding and allow for continued ridership growth.

The Metropolitan Transportation Commission (MTC) adopted an update to its Regional Transportation Plan, Plan Bay Area 2040, on July 26, 2017. The update includes the capital projects and service assumptions that make up the Transbay Corridor Core Capacity Program.

Figure 3-1. Current BART Map

3.2 Program Scope

To achieve 30 regularly scheduled ten-car trains per hour service, BART will require the following program elements:

- Expansion of the rail car fleet by 306 new cars, sufficient to operate 30 regularly scheduled ten-car trains in each direction during the peak **(TIRCP Scope)**
- Train Control Modernization Project (TCMP) to convert to a communications-based train control (CBTC) system with the capacity to handle 30 trains per hour in each direction (Non-2020 TIRCP Scope)
- Expansion of the Hayward Maintenance Complex (HMC) to provide additional storage capacity for the vehicles to be acquired for the Transbay Corridor Core Capacity Program (Non-TIRCP Scope)
- Added traction power facilities with the ability to support 30 ten-car trains per hour in each direction (Non-TIRCP Scope)

For detailed descriptions of the TIRCP Scope Core Capacity elements, please see *Section 2.4.2. Detailed Program Description*. As mentioned previously, the TIRCP Scope and funding request includes the additional 34 vehicles that were not claimed in the TIRCP 2018 award only.

Below, please find detailed descriptions of the **non-2020 TIRCP** Scope Program elements.

Train Control Modernization Project (TCMP)

BART's Train Control Modernization Project (TCMP) will replace the existing train control systems with a new communications-based train control (CBTC) system, allowing BART to achieve the shorter headways needed to operate 30 regularly scheduled trains per hour on the trunk line between Daly City and the Oakland Wye. The new CBTC system will be based on a moving-block signaling approach throughout the existing 122-mile system. The new CBTC system will be installed within or adjacent to the existing BART trackway and wayside facilities. Existing signaling equipment will be overlaid with the most current electronics, software, computer systems, and cabling. New zone controllers, interlocking controllers and wayside radio transponder tags will be installed throughout the trackside alignment, train control rooms and central control facilities. Cars and maintenance vehicles will be outfitted with processor-based controllers, transponders, communication equipment and location sensors.

Installation activities will include trenching for new cabling, concrete pads for electronic equipment along the trackway, as well as new racks, servers, computers, communication equipment and cable trays within the wayside train control rooms and central control facilities. These activities will take place within existing BART right-of-way.

Hayward Maintenance Complex Phase 2

Though not part of the TIRCP request, the Hayward Maintenance Complex and new Traction Power Substations are also vital elements of the overall Core Capacity Program.

The current storage capacity across all BART's yards and tail tracks is 893 vehicles. To accommodate the additional 306 new vehicles, and to maintain functional yards with room to properly position trains, BART will construct the Hayward Maintenance Complex Phase 2 (HMC Phase 2) to provide storage for 25 ten-car trains, or 250 additional rail vehicles. The yard will be constructed with access to the existing yard and electrified so that it may serve as a fully operational vehicle storage facility. The HMC offers the only practical site to expand storage within the BART system to accommodate the additional cars that

are part of the Core Capacity Program. HMC Phase 2 provides for additional storage capacity only and is not part of the TIRCP funding request

New Traction Power Substations

Traction power substations (TPSS) provide the electricity to run BART trains on the main lines, storage tracks, and yard and shop tracks. These substations transform 34.5 kV AC to 1,000 V DC for distribution through BART's electrified third rail. More frequent trains, newer and heavier vehicles, and the train performance profiles made possible by CBTC will put added loads on BART's existing traction power system. The TPSS are not part of the TIRCP funding request.

BART has conducted multiple simulations to assess the electrical power requirements associated with increasing service on the trunk line between Daly City and the Oakland Wye, with continuing service at increased frequencies on each of the branches. The simulation assumed 30 trains per hour on the trunk line, and took into consideration the electrical draw profile of BART's new vehicles, as well as the performance profile of the new CBTC system necessary to operate trains this frequently. The simulation revealed five locations where the traction power requirement for the higher-frequency service exceeds the capacity available from BART's existing traction power system, and where the installation of new traction power substations will be required:

1. Richmond – RYE Gap Breaker Conversion
2. Pleasant Hill – David Avenue and Minert Road
3. Oakland – Vicinity of MacArthur Station
4. Downtown San Francisco – Civic Center Station
5. Downtown San Francisco – Montgomery Station

BART is currently undertaking a major replacement and upgrading of its existing traction power system, aimed at maintaining the traction power system in a state of good repair and providing enhancements. While distinct from the Core Capacity Program in terms of purpose and funding, the replacement and upgrade will occur concurrently with the Core Capacity Program, requiring close coordination.

The successful planning, financing, procurement, design, construction, manufacturing, testing and commissioning of each of each program element are key milestones to achieving the goal of increased Transbay capacity. A detailed schedule with Core Capacity Program milestones can be found in *Section 3.2.4. Program Schedule*.

3.2.1 Program Location

BART is located in the San Francisco Bay Area, and specifically San Francisco, Alameda, Contra Costa, San Mateo, and Santa Clara Counties. The Core Capacity Program is in the Transbay Corridor, connecting the East Bay with the San Francisco Peninsula.

The TIRCP scope of the Program will relieve crowding through the Transbay Tube by adding more cars to each train, as well as additional locations throughout the East Bay. The location of the TIRCP Scope is denoted by heavy dashed line in Figure 3-2.

Figure 3-2. Transbay Corridor Core Capacity Program

Figure 3-2 also shows the location of the non-TIRCP scope Core Capacity elements, including the five planned traction power substations and the Hayward Maintenance Complex (Phase 2).

For additional maps showing disadvantaged communities, low income communities, and other designated communities along the BART alignment, please see *Section 2.5.1. Program Benefits to Disadvantaged and Low-Income Communities.* Additionally, for more information on GHG reducing features of the Program, as well as land use density, housing development along the BART system, and more – please see multiple sections in the *Project Benefits Section*.

Table 3-1 lists census tracts and corresponding zip codes, cities, and counties where disadvantaged communities are within a half mile of the BART alignment.

Table 3-1. Disadvantaged Communities Located within a half mile of BART Alignment

County	City	ZIP	Census Tract
Alameda	Berkeley	94710	6001422000
Alameda	Emeryville	94608	6001401000
Alameda	Emeryville	94608	6001401400
Alameda	Emeryville	94608	6001401500
Alameda	Emeryville	94608	6001425104
Alameda	Hayward	94544	6001438203
Alameda	Oakland	94601	6001406100
Alameda	Oakland	94601	6001406201
Alameda	Oakland	94601	6001407200
Alameda	Oakland	94601	6001407300
Alameda	Oakland	94601	6001407400
Alameda	Oakland	94603	6001409100
Alameda	Oakland	94603	6001409200
Alameda	Oakland	94603	6001409300
Alameda	Oakland	94603	6001409400
Alameda	Oakland	94606	6001405401
Alameda	Oakland	94606	6001406000
Alameda	Oakland	94607	6001401600
Alameda	Oakland	94607	6001401700
Alameda	Oakland	94607	6001401800
Alameda	Oakland	94607	6001402200
Alameda	Oakland	94607	6001402400
Alameda	Oakland	94607	6001402500
Alameda	Oakland	94607	6001403000
Alameda	Oakland	94607	6001403300
Alameda	Oakland	94607	6001410500
Alameda	Oakland	94612	6001402700
Alameda	Oakland	94621	6001408800
Alameda	Oakland	94621	6001408900
Alameda	Oakland	94621	6001409000
Alameda	Oakland	94621	6001409500
Alameda	San Leandro	94577	6001432400
Alameda	San Leandro	94577	6001432501
Alameda	San Leandro	94578	6001433200
Alameda	Union City	94587	6001440301
Contra Costa	Antioch	94509	6013305000
Contra Costa	Pittsburg	94565	6013309000
Contra Costa	Pittsburg	94565	6013310000
Contra Costa	Pittsburg	94565	6013311000
Contra Costa	Pittsburg	94565	6013312000
Contra Costa	Pittsburg	94565	6013313101

Contra Costa	Pittsburg	94565	6013313102
Contra Costa	Pittsburg	94565	6013314103
Contra Costa	Pittsburg	94565	6013314104
Contra Costa	Richmond	94801	6013365002
Contra Costa	Richmond	94801	6013375000
Contra Costa	Richmond	94801	6013376000
Contra Costa	Richmond	94801	6013377000
Contra Costa	Richmond	94804	6013379000
Contra Costa	Richmond	94804	6013380000
Contra Costa	Richmond	94804	6013381000
Contra Costa	Richmond	94804	6013382000
Contra Costa	San Pablo	94806	6013368001
San Francisco	San Francisco	94102	6075012502
San Francisco	San Francisco	94103	6075017601
San Francisco	San Francisco	94107	6075017801
San Francisco	San Francisco	94130	6075017902
San Mateo	San Bruno	94066	6081604200
San Mateo	South San Francisco	94080	6081602300
Santa Clara	Alviso	95002	6085504602
Santa Clara	San Jose	95112	6085500100
Santa Clara	San Jose	95112	6085501102
Santa Clara	San Jose	95116	6085501401
Santa Clara	San Jose	95131	6085504318
Santa Clara	San Jose	95133	6085503601

A KMZ file has also been provided separately for the Program with the transit route/Program location represented by lines and stops represented by points. It is included in this application separately and named "*ProgramLocation_KMZ".* For maps and descriptions of the Program outcomes of reduced GHG emissions, surrounding land use density, housing and employment centers, transit oriented development, and more, please see multiple sections in the Program Narrative. Additional data regarding BART station locations and communities of interest can be provided as needed.

3.2.2 Program Costs and TIRCP Funds Requested

Core Capacity Program Costs are shown below in Table 3-2. All cost estimates described and shown in this application are escalated to the year of proposed delivery.

Table 3-2. Total Program Cost

Program Scope	Total Program Cost ($ millions)	*TIRCP Scope Request ($ millions)*
Vehicles (Does not include $250,000 for Community Outreach Scope)	$1,105.5	*$119*
TIRCP SCOPE TOTALS	**$1,105.5**	***$119***
Communications-based Train Control	$1,673.4	
Hayward Maintenance Complex Phase II	$334.6	
Traction Power	$136.8	
Program Management	$27.1	
Program Contingency	$249	
TOTAL	**$3,536.4**	***$119***

3.2.3 Program Operating Plan

BART has completed a detailed Operating and Maintenance Cost Estimate Report that shows the next 20 years of operation and evaluates what costs are associated with increased Core Capacity Program operations by using a model that was originally based on FTA guidance. The model looks at Build versus No Build alternatives for the next 20 years and the Build Alternative is driven by key factors for this project, such as car miles, number of stations, ridership, number of vehicles, etc. Key factors determine the BART departmental costs and allow for projecting increases in those operating costs over the next 20 years. BART revises departmental budgets annually, and those revisions include a 5-year forecast including any necessary budget adjustments.

Additionally, there is a ramp up period associated with the Core Capacity Program. With the arrival of additional cars, BART will initially increase the length of trains while keeping headways the same. At that point, BART will begin to ramp up frequency until the system hits 28 trains per hour.

Because BART will be retiring older cars and accepting new cars as the Core Capacity Program moves forward, BART is looking at adjusting its staffing resources from an emphasis on maintenance and overhaul to material expediters and strategic maintenance professionals. The timing of this transition is such that much of the BART staff doing maintenance will transition to focus on the “fleet of the future” as older vehicles are pulled offline. This transition will require a retraining of existing maintenance professionals rather than hiring new professionals.

In general, BART tailors its operating plan, including train frequencies and train lengths, to the demand for service. With actual and projected near-term increases in ridership demand, BART will deliver service

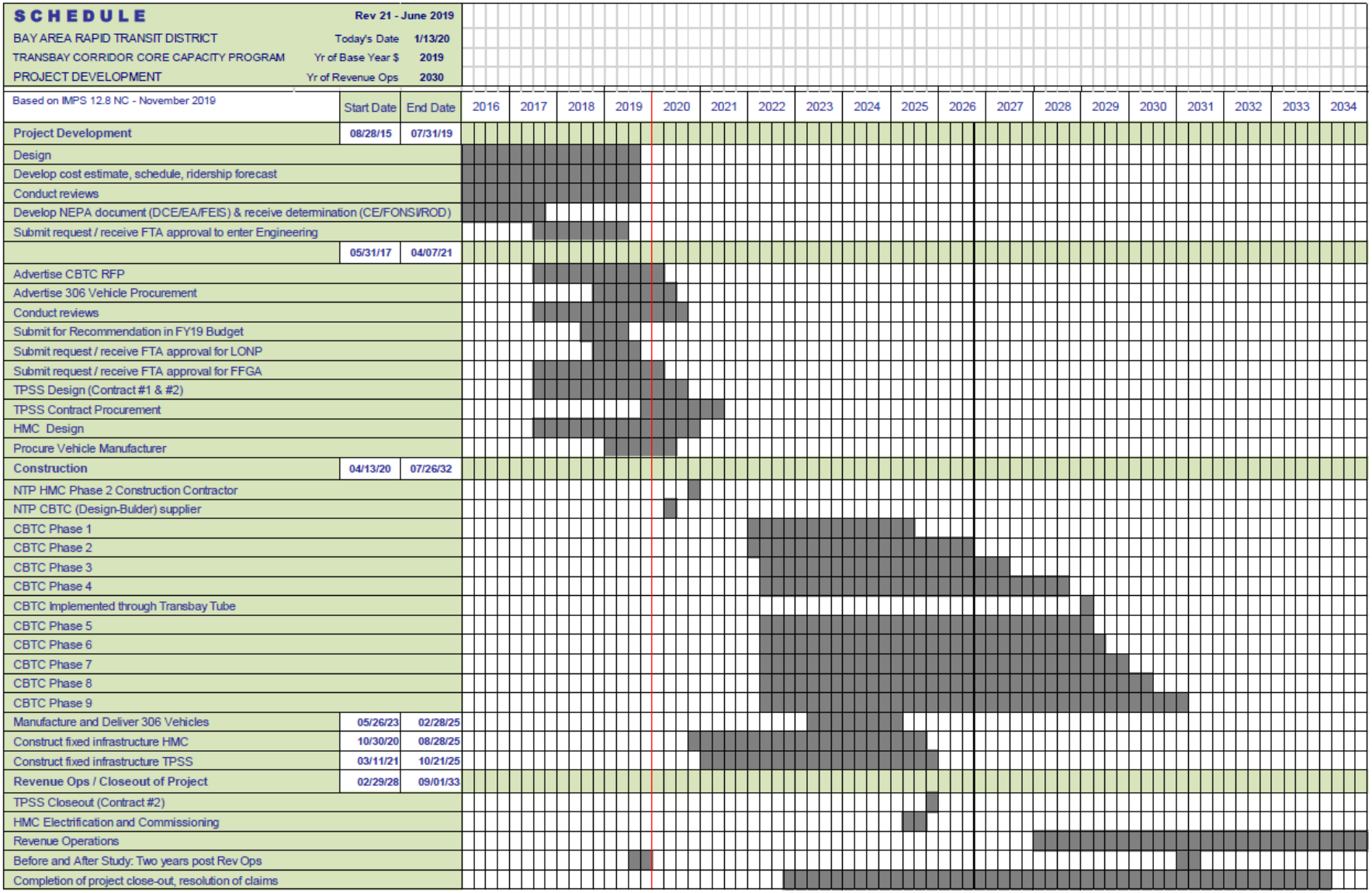
and capacity increases through new BART line extensions (to Berryessa and Antioch) and the new vehicle “fleet of the future”, all of which are anticipated to be online within a year.

3.2.4 Program Schedule

BART has developed a schedule to coordinate delivery of the four program elements and achieve 28 trains per hour (TPH) through the Transbay Tube by 2028 and 30 TPH beginning in 2030. For high-level view of the Core Capacity Program schedule, please see *Section 2.9. Program Readiness*.

The Program has been sequenced to deliver all four component projects concurrently to minimize the overall Program duration and bring the benefits to fruition as quickly as possible. CBTC contains the longest schedule duration in the Program. Accordingly, the Program critical path extends through the CBTC implementation schedule.

Figure 3-3. Core Capacity Program Schedule



3.2.5 Current Program Status

The Federal Transit Administration (FTA) approved the Core Capacity Program into the Capital Investment Grant (CIG) pipeline in August 2015, received approval for entry into Engineering in June, 2019, and expects to receive the Full Funding Grant Agreement (FFGA) in early 2020. Overall program design is currently at the 65 percent level, with the Vehicles currently at 100% design. BART has initiated a design-build procurement for the communications-based train control system and is negotiating a follow-on contract with Bombardier for the 306 new vehicles. With approval into Engineering, BART continues to advance HMC Phase 2 and the traction power substations beyond the 65 percent design stage.

The Program will take place entirely within publicly owned transportation right-of-way, the majority of which is already owned by BART. BART will seek a cooperative agreement from Caltrans for the installation of a TPSS on the sole piece of property not owned by BART. BART has received approval by Caltrans of the PSR-PR for this site and is continuing to work with Caltrans for further approvals needed. The TPSS on Caltrans property is not included in this request.

3.2.6 Procurement Progress

Table 3-3 summarizes the current procurement status.

Table 3-3. Procurement Status

Program Element	Procurement Status
Vehicles	Contract with Bombardier is currently being negotiated and is planned for July 2020
HMC Phase 2	Construction contract documents are under development. Awards are expected in March 2020 for track, September 2020 for storage yard CIVIL / Grading Contract, and August 2021 for HMC Storage Yard construction. The Storage Yard Flyover (elevated element of work) has been deleted. It has been replaced with a more economical and efficient at-ground crossover (North and South) elements.
Communications Based Train Control	Request for design-build qualifications released August 15, 2017. BART anticipates issuing NTP to the selected bidder at the end of March 2020.
Traction Power	The fabrication and installation of traction power substations will be procured following completion of the design phases. There are 2 contracts in this project: Contract #1 for the West Bay (SF), design has been completed and RFP has been issued Nov. 2019. Award is anticipated for February 2020 with installation planned for September 2021. Contract #2 for the East Bay has design at 30% and Award is planned for April 2021 with installation planned for September 2022.

3.2.7 Funding

Table 3-4 on the following page summarizes the funding sources that BART intends to use for the entire Core Capacity Program. This section presents the various capital funding sources that BART is assembling. For more details on committed funds, see *Section 3.2.8 Committed and Planned Funds.*

Table 3-4. Core Capacity Funding Plan, November 2019 (in $millions)

Core Capacity Program Element	Committed							Budgeted/ Planned					Totals		
	TCP	Exchange Account	BART Capital Allocation	AATC funds	RM3	TIRCP (2018)	Measure RR	FTA CIG	TIRCP (2020)	CMAs	Santa Clara VTA	SB1 Local Partner and Congested Corridors	Total Cost	Total Committed	Total Planned
Vehicles (TIRCP Scope)	-	$ 179.00	$ 31.76	-	$ 500.00	-	-	$ 208.87	$ 119.00	$ 66.64	-	-	$ 1,105.53	$ 710.76	$ 394.76
Communication Based Train Control	$ 68.98	-	$ 52.93	$ 34.89	-	$ 318.60	$ 400.00	$ 397.24	-	$ 233.36	$ 111.79	$ 55.88	$ 1,673.42	$ 875.40	$ 798.02
Hayward Maintenance Center Phase II	-	-	$ 50.52	-	-	-	$ 21.58	$ 272.50	-	-	-	-	$ 344.60	$ 72.10	$ 272.50
Traction Power	-	-	$ 2.69	-	-	-	$ 41.50	$ 92.60	-	-	-	-	$ 136.79	$ 44.19	$ 92.60
Program Management	-	-	$ 7.53	-	-	-	$ 5.70	$ 13.86	-	-	-	-	$ 27.09	$ 13.23	$ 13.86
Program Contingency	-	-	$ 65.07	-	-	-	-	$ 183.93	-	-	-	-	$ 249.00	$ 65.07	$ 183.93
Total Program	**$ 68.98**	**$ 179.00**	**$ 210.49**	**$ 34.89**	**$ 500.00**	**$ 318.60**	**$ 468.78**	**$ 1,169.00**	**$ 119.00**	**$ 300.00**	**$ 111.79**	**$ 55.88**	**$ 3,536.42**	**$ 1,780.75**	**$ 1,755.67**

Note: This funding plan does not include the additional Community Outreach scope for $250,000.

This TIRCP application includes a request for 34 Vehicles ($119 million). As stated previously, BART is requesting $119 million in TIRCP funds to be programmed over FY 2020-2021 to FY 2024-2025, and can be allocated as soon as possible.

Other sources of funding for the TIRCP Scope components include:

- MTC Exchange Account
- TCP – MTC Administered Transit Capital Priorities
- BART Capital Allocation
- AATC Funds – Advanced Automatic Train Control Grant Funds
- BART Measure RR
- FTA CIG – Federal Transit Administration Capital Investment Grants
- RM3 – Regional Measure 3, Bridge Tolls
- CMAs – Congestion Management Agency Funds
- Santa Clara VTA
- SB1 – Local Partnership and Congested Corridor

3.2.8 Committed and Planned Funds

Per the TIRCP guidelines, 50% of the total Core Capacity Program funds are committed at the time of this application, this does not include the expected FTA CIG funds in 2020. Additionally, of the TIRCP Scope of requested funds, 64% of funds are committed at the writing of this application which also does not include the expected FTA CIG funds in 2020. If the planned FTA funds were considered committed, both the total Core Capacity Program and the 306 Vehicles (TIRCP Scope) would be 83% funded.

The Core Capacity Program is estimated to cost $3,536.4 million. BART is seeking $119 million or just over 3 percent of the total Program cost in TIRCP 2020 funds. BART is requesting 11 percent of the 306 Vehicles cost in this 2020 TIRCP application Due to program requirements, some of the funding sources anticipated may only be used for certain elements of the overall program. Measure RR funds, for example, may not be used to acquire rail vehicles.

See Table 3-4 for a breakdown of funding sources and what is committed versus planned. The following sources of funding are designated as committed, per TIRCP guidelines:

- TCP and Exchange Account
- BART Capital Allocation
- AATC Funds
- RM3
- TIRCP 2018
- Measure RR

The following sources of funding are designated as budgeted / planned:

- FTA CIG (Expected early 2020)
- TIRCP 2020
- CMAs
- Santa Clara VTA

For more details on all funding sources, see *Section 3.2.9 Funding Sources in Detail.*

3.2.9 Funding Sources in Detail

Each funding source is described below in detail.

3.2.9.1 FTA Capital Investment Grants

BART is requesting nearly $1.17 billion from the FTA's discretionary CIG program for those parts of the Core Capacity Program that are eligible under this program. Funding is dependent upon meeting FTA criteria for project justification and local financial commitment, and upon meeting readiness requirements.

In June 2019, the Core Capacity Program was admitted to Entry into Engineering, with a Full Funding Grant Agreement expected in early 2020. A copy of the Entry into Engineering admittance letter is provided in *Appendix L*.

3.2.9.2 MTC-administered TCP and Exchange Account

The MTC-administered Transit Capital Priorities (TCP) process includes funds from several federal and regional programs, including but not limited to, Surface Transportation Program (STP), Congestion Mitigation and Air Quality (CMAQ), Section 5307, and AB 664 Bridge Tolls. MTC administered TCP contributions towards the Core Capacity Program would be drawn from federal sources. An estimated $179 million has been committed by MTC towards the additional vehicles and $69 million is committed towards communications-based train control.

3.2.9.3 Advanced Automatic Train Control (AATC) Grant Funds

Advanced Automatic Train Control (AATC) refers to Settlement Agreement Funds derived from litigation between BART and GE Transportation Systems, whose predecessor corporation was retained by BART in 1998 to develop a new train control system. BART spent approximately $92M on the project, but no product was received and installed. The subsequent settlement agreement resolved the matter and $48.1 million of the unspent balances are settlement funds now available to BART.

3.2.9.4 BART Capital Allocations

BART has made a commitment to fund three projects that are needed for system reliability and for system capacity increases to meet future ridership demand: new rail cars, HMC, and train control modernization. Incremental fare revenue from the January 1, 2014 and 2016 fare increases and subsequent fare increases scheduled for 2018 and 2020 are directly allocated to a separate account to fund these projects. To fund these capital contributions, the latest Short Range Transit Plan (SRTP) assumes additional fare increase allocations through FY26. The BART Capital Allocation funds for the

Core Capacity program ($210 million) include $49.1 million that will be advanced for Program expenses and repaid with CIG apportionments.

3.2.9.5 BART Measure RR

Measure RR is a general obligation bond measure which was passed by the voters in the BART District in November 2016. The measure provides $3.5 billion to fund the system's most critical investments for maintaining the system in a state-of-good-repair and crowding relief. BART staff is currently working to implement the Measure RR investments as quickly as possible, balancing the need for reinvestment with the need to minimize service disruption.

Measure RR is a committed funding source and $469 million in bond proceeds is targeted for elements of the Core Capacity Program, as specified in the ballot measure. It is committed for the TIRCP request.

3.2.9.6 TIRCP 2018

In 2018, BART was awarded $318.6 million for funding portions of the CBTC and 306 Vehicles. This current application is for the 24 Vehicles of the 306 whose benefits were not counted in the 2018 award, and so count as a separate/new project requesting TIRCP 2020 funding.

3.2.9.7 Regional Measure 3 (RM3) Bridge Tolls

In 2018, MTC went to the region's voters with a ballot measure, called Regional Measure 3, to raise tolls on the seven state-owned bridges in the San Francisco Bay Area. The $4.5 billion measure will provide critical funding for highway, rail, transit, and bridge projects that constrain or reduce congestion in the bridge corridors. As delineated in the authorizing legislation, SB 595 (Ch. 650, 2017), BART would receive $500 million in Regional Measure 3 funding for the expansion of the BART fleet.

3.2.9.8 Congestion Management Agency (CMA) Funds

The three BART district counties are expected to contribute $100 million each, $300 million in total, toward the purchase of the 306 rail vehicles and the CBTC system.

3.2.9.9 Santa Clara VTA Contribution

Voters in Santa Clara County approved a sales tax measure in 2000 designed to fund transit service and the future extension of BART to Santa Clara, called Silicon Valley Rapid Transit (SVRT). The first phase of the SVRT program, a two-station extension to Berryessa, is now under construction and is scheduled to begin revenue service in 2020.

VTA and BART reached agreement in November 2001 regarding the relationship between the two organizations for the duration of the planning, building, and operating of the BART extension into Santa Clara County. The agreement commits VTA to fund the purchase of new rail cars needed to serve the SVRT project, but is not part of the Core Capacity Vehicle purchase.

VTA has also committed to funding the portion of the Train Control Modernization Program that will upgrade the SVRT segment to Communications-Based Train Control. VTA is thus expected to contribute an estimated $111.8 million towards the Transbay Corridor Core Capacity Program over the next 10 years.

3.2.9.10 SB1 – Solutions for Congested Corridors Program (SCCP) & Local Partnership Program (LPP)

The purpose of the Solutions for Congested Corridors Program is to provide funding to achieve a balanced set of transportation, environmental, and community access improvements to reduce traffic congestion throughout the state. This statewide, competitive program makes $250 million available annually for projects that implement specific transportation performance improvements and are part of a comprehensive corridor plan by providing more transportation choices while preserving the character of local communities and creating opportunities for neighborhood enhancement.

The purpose of the LLP is to provide local and regional transportation agencies that have passed sales tax measures, developer fees, or other imposed transportation fees with a continuous appropriation of $200 million annually to fund improvements to state highways, transit facilities and local roads, and the acquisition, retrofit or rehab of rolling stock, buses or other transit equipment, including facilities The California Transportation Commission is responsible for guidelines development and administration of this program.

3.2.10 Funding Partners

Bay Area Rapid Transit District

BART owns and operates a heavy-rail rapid transit system serving the San Francisco Bay Area. The system connects San Francisco with cities in the East Bay, suburbs in northern San Mateo County, Oakland and SFO. BART was created in 1957 by the California State Legislature in response to Bay Area growth and transportation needs. It began service in 1972. BART operates five fixed-route rail lines in Alameda, Contra Costa, San Francisco, and San Mateo counties.

To comply with the Americans with Disabilities Act (ADA), BART has financial and administrative agreements with other transit operators to provide paratransit service comparable and complementary to the BART system.

Several Bay Area bus operators provide connecting (or “feeder”) service to BART. BART contributes to the operation of these feeder services by providing a share of its State Transit Assistance (STA) funds allocated by MTC, and funding from BART’s operating budget.

State of California and SB1

The State of California provides funds to BART. The state’s Traffic Congestion Relief Program (administered by the California Transportation Commission) and Proposition 1B (administered by Caltrans) direct capital funds to BART in addition to the state’s other funding programs, including State Transit Assistance (STA); Proposition 42’s dedication of state taxes to transportation, Transit and Intercity Rail Capital Program/Cap and Trade; and AB434 Transportation Fund for Clean Air.

Metropolitan Transportation Commission

The Metropolitan Transportation Commission (MTC) is the transportation planning, financing and coordinating agency for the nine-county San Francisco Bay Area. The Commission’s work is guided by a 21-member policy board. MTC is responsible for producing and updating the Regional Transportation Plan (RTP), a comprehensive blueprint for the development of mass transit, highway, airport, seaport,

railroad, bicycle and pedestrian facilities. MTC's current RTP, known as Plan Bay Area 2040, was adopted on July 26, 2017 and includes the Core Capacity Program within the fiscally constrained plan. As the designated recipient of federal transit formula funds in the Bay Area, MTC administers funding from several federal programs to the region's transit agencies. In addition, the Commission is a programming agent for several state transit grant programs including State Transit Assistance.

Federal Transit Administration

The Federal Transit Administration (FTA) provides formula and discretionary grants to state and local governments to support capital investments in public transportation. One of the discretionary programs is the Section 5309 Capital Investment Grant (CIG) program which funds New Starts, Small Starts, and Core Capacity projects. Core Capacity projects are substantial corridor-based capital investments in existing fixed guideway systems that increase capacity by not less than 10 percent in corridors that are at capacity today or will be within five years.

The CIG program was authorized in the Fixing America's Surface Transportation (FAST) Act of 2015 at $2.3 billion per year through federal FY2020. Federal funding commitments are made on a discretionary basis via multi-year Full Funding Grant Agreements (FFGA), and are subject to annual appropriations by Congress. Projects must meet statutory requirements for project justification and local financial commitment, and must be deemed to be ready for a funding commitment.

BART is requesting up to $1.1 billion in capital funding from FTA's CIG program.

San Francisco County Transportation Authority

The San Francisco Country Transportation Authority (Transportation Authority) was created in 1989 and is responsible for long-range transportation planning for the city. The Transportation Authority funds improvements for San Francisco's roadway and public transportation systems.

As the Congestion Management Agency (CMA) for San Francisco, the San Francisco County Transportation Authority is responsible for developing and adopting a Congestion Management Program (CMP) for San Francisco on a biennial basis. The CMP is the principal policy and technical document that guides the Transportation Authority's CMA activities and demonstrates conformity with congestion management law.

The SFCTA is exploring several revenue-generating measures for transportation projects and programs for a ballot measure in 2022. It is anticipated that additional BART cars and/or a contribution to the train control system would be a designated recipient of at least $100 million of these revenues.

Alameda County Transportation Commission

The mission of the Alameda County Transportation Commission (Alameda CTC) is to plan, fund and deliver transportation programs and projects that expand access and improve mobility to foster a vibrant and livable Alameda County.

As the Congestion Management Agency for Alameda County, Alameda CTC develops and updates the legislatively required Congestion Management Plan, a plan that describes the strategies to assess,

monitor and improve the performance of the county's multimodal transportation system; address congestion; and ultimately protect the environment with strategies to help reduce greenhouse gas emissions.

The Alameda County sales tax, Measure BB, was passed by voters in Alameda County in 2014. Alameda CTC will consider amending the current expenditure plan to reallocate $100 million from other projects to rail vehicles that are part of BART's Core Capacity Program.

Contra Costa Transportation Authority

The Contra Costa Transportation Authority (CCTA) is a public agency formed by Contra Costa County voters in 1988 to manage the county's transportation sales tax program and to conduct countywide transportation planning.

CCTA is responsible for maintaining and improving the county's transportation system by planning, funding, and delivering critical transportation infrastructure projects and programs that connect communities, foster a strong economy, increase sustainability, and safely and efficiently get people where they need to go. CCTA is also the county's designated CMA, responsible for putting programs in place to keep traffic levels manageable.

A Contra Costa sales tax is being presented to voters in Contra Costa County in March 2020. The Measure would authorize $120 million for BART.

Santa Clara Valley Transportation Authority

Santa Clara Valley Transportation Authority (VTA) is an independent special district that provides bus, light rail, and paratransit services within Santa Clara County. It also participates as a funding partner in regional rail service including Caltrain, Capital Corridor, and the Altamont Corridor Express. As the county's CMA, VTA is responsible for countywide transportation planning, including congestion management, design and construction of specific highway, pedestrian, and bicycle improvement projects, as well as promotion of transit-oriented development.

VTA has committed to funding that portion of the Train Control Modernization Project that will lie within Santa Clara County. Some $111.8 million in VTA funds are anticipated for this purpose over the next 10 years. VTA will also pay for the added operating and maintenance costs that result from shortening BART headways within Santa Clara County.

3.2.11 Project Programming Request (PPR) Form

Please find PPR form for the Vehicles (2020 TIRCP scope) on the following pages.

STATE OF CALIFORNIA ● DEPARTMENT OF TRANSPORTATION

PROJECT PROGRAMMING REQUEST

DTP-0001 (Revised 13 Aug 2019 v8.01g) *General Instructions*

Amendment (Existing Project)	No	**Date:**	1/13/20

District	EA	Project ID	PPNO	MPO ID	
04					

County	Route/Corridor	PM Bk	PM Ahd	Nominating Agency	
CC				SF Bay Area Rapid Transit (BART)	
ALA				**MPO**	**Element**
SF				MTC	Mass Transit

Project Manager/Contact	Phone	E-mail Address
Nikki Foletta	(510) 874-7346	nfolett@bart.gov

Project Title

Transbay Corridor Core Capacity Program: Vehicle Acquisition

Location (Project Limits), Description (Scope of Work)

The Core Capacity Program:Vehicle Acquisition is located in Alameda, Contra Costa, and San Francisco Counties but benefits the entire BART system beyond the Transbay Corridor. This 2020 TIRCP request includes purchasing the remaining 34 cars of the necessary 306 new vehicles that will lead to relieving current levels of crowding during the peak, while also creating opportunity for ridership growth.

Component	Implementing Agency
PA&ED	BART
PS&E	BART
Right of Way	BART
Construction	BART

Legislative Districts

Assembly:	18	Senate:	9	Congressional:	13

Project Benefits

The procurement of an additional 306 cars will allow for increased capacity, decreased crowding, and encourage increased ridership. Specifically, the overall Core Capacity Project will increase average daily ridership by over 200,000 riders, decrease GHG emissions in the corridor by over 6 million metric tons of carbon dioxide-equivalent over the lifetime of the project, and support a more reliable and safer BART system for all users. This request is for the remaining 34 vehicles of the 306.

Purpose and Need

See Project Info Page 2

Category	Outputs	Unit	Total
Rail / Multi-Modal	Rail cars/ transit vehicles	EA	34

NHS Improvements	No	Roadway Class	NA	Reversible Lane analysis	No
Inc. Sustainable Communities Strategy Goals	Yes	Reduces Greenhouse Gas Emissions	Yes		

Project Milestone	Existing	Proposed
Project Study Report Approved	N/A	
Begin Environmental (PA&ED) Phase		N/A
Circulate Draft Environmental Document — **Document Type**		N/A
Draft Project Report		N/A
End Environmental Phase (PA&ED Milestone)		N/A
Begin Design (PS&E) Phase		4/3/2017 - Comm
End Design Phase (Ready to List for Advertisement Milestone)		10/7/2020 - Fina
Begin Right of Way Phase		N/A
End Right of Way Phase (Right of Way Certification Milestone)		N/A
Begin Construction Phase (Contract Award Milestone)		5/28/2023 - Start
End Construction Phase (Construction Contract Acceptance Milestone)		1/28/2025 - Deliv
Begin Closeout Phase		2/28/2025 - Conc
End Closeout Phase (Closeout Report)		2/28/2027 - 2 ye

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PROJECT PROGRAMMING REQUEST

Additional Information

Purpose and Need: BART's existing Transbay Corridor ridership exceeds capacity in the peak hours between Embarcadero station in San Francisco and many East Bay locations. The most crowded part of this corridor is the five-mile-long Transbay Tube, where average riders have just 4.7 square feet of space, far lower than the FTA threshold for normal crowding. Current BART riders endure this crowding, while many commuters choose other modes. BART's ability to increase ridership, and the region's ability to steer growth to places served by transit, depend upon additional BART capacity in the Transbay Corridor. BART's Core Capacity Project, of which 306 additional rail cars is an element, is absolutely necessary to realize the benefits listed here and in the application. This request is for the 34 remaining cars.

Supports Sustainable Communities Strategy Goals: The acquisition of the additional 34 vehicles is necessary for the Core Capacity Program to meet the Bay Area's Sustainable Communities Stretegy Goals in a number of ways, including reduction of GHG emissions and investment in housing around priority development areas.

Reduces Greenhouse Gas Emissions: The acquisition of the additional 34 vehicles is necessary to realize the GHG benefits discussed in the application (Section 2.4.3.1)

STATE OF CALIFORNIA ● DEPARTMENT OF TRANSPORTATION

PROJECT PROGRAMMING REQUEST

DTP-0001 (Revised 13 Aug 2019 v8.01g)

Date: 1/13/20

District	County	Route	EA	Project ID	PPNO	
04	CC, ALA, SF					
Project Title:	Transbay Corridor Core Capacity Program: Vehicle Acquisition					

Existing Total Project Cost ($1,000s)									
Component	Prior	20-21	21-22	22-23	23-24	24-25	25-26+	Total	**Implementing Agency**
E&P (PA&ED)									BART
PS&E									BART
R/W SUP (CT)									BART
CON SUP (CT)									BART
R/W									BART
CON	2,000	179,000			250,000	250,000	29,761	710,761	BART
TOTAL	2,000	179,000			250,000	250,000	29,761	710,761	
Proposed Total Project Cost ($1,000s)									**Notes**
E&P (PA&ED)									
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON		55,400	135,015	187,925	16,424			394,764	
TOTAL		55,400	135,015	187,925	16,424			394,764	

Fund No. 1:	**TIRCP 2020**							**Program Code**
Existing Funding ($1,000s)								
Component	Prior	20-21	21-22	22-23	23-24	24-25	25-26+	Total	**Funding Agency**
E&P (PA&ED)									State of California
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON									
TOTAL									
Proposed Funding ($1,000s)									**Notes**
E&P (PA&ED)									
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON		55,400	63,600					119,000	
TOTAL		55,400	63,600					119,000	

Fund No. 2:	**Exchange Account (FTA - BART - MTC)**							**Program Code**
Existing Funding ($1,000s)								
Component	Prior	20-21	21-22	22-23	23-24	24-25	25-26+	Total	**Funding Agency**
E&P (PA&ED)									MTC & FTA
PS&E									FTA Preventive Maintenance funds awarded to BART; equivalent amt of BART funds placed in MTC administered restricted account.
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON		179,000						179,000	
TOTAL		179,000						179,000	
Proposed Funding ($1,000s)									**Notes**
E&P (PA&ED)									
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON									
TOTAL									

Fund No. 3:	BART Capital Allocation								Program Code
Existing Funding ($1,000s)									
Component	Prior	20-21	21-22	22-23	23-24	24-25	25-26+	Total	Funding Agency
E&P (PA&ED)									BART
PS&E									Allocations made from BART's Operating Budget to Capital Budget due to surplus funds.
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON	2,000						29,761	31,761	
TOTAL	2,000						29,761	31,761	
Proposed Funding ($1,000s)									Notes
E&P (PA&ED)									
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON									
TOTAL									

Fund No. 4:	RM3								Program Code
Existing Funding ($1,000s)									
Component	Prior	20-21	21-22	22-23	23-24	24-25	25-26+	Total	Funding Agency
E&P (PA&ED)									MTC
PS&E									Regional Measure 3 Bridge Tolls
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON					250,000	250,000		500,000	
TOTAL					250,000	250,000		500,000	
Proposed Funding ($1,000s)									Notes
E&P (PA&ED)									
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON									
TOTAL									

Fund No. 5:	FTA CIG								Program Code
Existing Funding ($1,000s)									
Component	Prior	20-21	21-22	22-23	23-24	24-25	25-26+	Total	Funding Agency
E&P (PA&ED)									FTA
PS&E									FTA Capital Investment Grant.
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON									
TOTAL									
Proposed Funding ($1,000s)									Notes
E&P (PA&ED)									Full Funding Grant Agreement anticipated in CY20Q1
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON			4,522	187,925	16,424			208,871	
TOTAL			4,522	187,925	16,424			208,871	

Fund No. 6:	Congestion Management Agencies								Program Code
Existing Funding ($1,000s)									
Component	Prior	20-21	21-22	22-23	23-24	24-25	25-26+	Total	Funding Agency
E&P (PA&ED)									Congestion Management Agencies
PS&E									Alameda, Contra Costa, and SF Congestion Management Agency contribution (source may be from county sales tax or other, at the discretion of agency)
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON									
TOTAL									
Proposed Funding ($1,000s)									Notes
E&P (PA&ED)									
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON			66,893					66,893	
TOTAL			66,893					66,893	

3.2.12 Usable Segment & Program Scalability

BART is requesting $119 million for 34 Vehicles. This funding request would cover the necessary cost to complete the purchase of the remaining 34 Vehicles of the 306 that are needed to realize the benefits discussed in this application. The TIRCP 2018 award included funding for 272 cars, and this $119 million will fund these remaining and necessary vehicles.

Table 3-5. Core Capacity Program Costs and TIRCP Usable Segment Request

Program Scope	Total Program Cost ($ millions)	*TIRCP Usable Segment Request ($ millions)*
Vehicles (Does not include $250,000 for Post-Award Community Outreach)	$1,105.5	*$119*
TIRCP SCOPE TOTALS	**$1,105.5**	***$119***
Communications-based Train Control	$1,673.4	
Hayward Maintenance Complex Phase II	$334.6	
Traction Power	$136.8	
Program Management	$27.1	
Program Contingency	$249	
TOTAL	**$3,536.4**	***$119***

BART is submitting a scaled request of $60 million as a usable segment. This scaled down funding request would cover the necessary cost to complete the purchase of 17 Vehicles of the 306 that are needed to realize the benefits discussed in this application, this is half of the full request noted above.

The cost of each of the 306 vehicles necessary to realize the benefits shown in this application is $3.5 million per vehicle. Any award amount under the $119 million provided in this tiered request will be applied to purchasing additional vehicles, even if the remaining 34 cannot be fully funded. **The results and benefits discussed in this application, as well as the 2018 TIRCP award, will not be realized until all 306 Vehicles and the CBTC system are fully funded.**

4 Support Documentation

4.1 Cost Estimate Certification

All costs included in this TIRCP application are approved by the General Manager, as attested to in the authorization letter.

4.2 Letters of Support

The Core Capacity Program has broad support from State elected officials, regional organizations, and community based non-profits. In *Appendix A*, please find the following letters of support for BART application for TIRCP funds for the Core Capacity Program:

- Metropolitan Transportation Commission – Consistency with Regional Sustainable Communities Strategy Confirmation
- San Francisco County Transportation Authority
- City of Oakland
- Alameda County Transportation Commission
- Contra Cost Transportation Authority

Elected Officials

- Senator Steven Glazer, 7th Senate District; Senator Nancy Skinner, 9th Senate District; Senator Bob Wieckowski, 10th Senate District; Senator Scott Wiener, 11th Senate District; Senator Jerry Hill, 13th Senate District; Senator Jim Beall, 15th Senate District
- David Chiu, Assemblymember 17th District; Philip Ting, Assemblymember 19th District; Buffy Wicks, Assemblymember 15th District; Kevin Mullin, Assemblymember 22nd District; Kansen Chu, Assemblymember 25th District; Timothy Grayson, Assemblymember 14th District; Bill Quirk, Assemblymember 20th District; Ash Kalra, Assemblymember 27th District; Rob Bonta, Assemblymember 18th District; Rebecca Bauer-Kahan, Assemblymember 16th District

Community Organizations

- East Bay Asian Local Development Corporation
- The Unity Council
- Asian Health Services
- Low Income Investment Fund

Transportation and Policy Organizations

- Bay Area Council
- San Francisco Transit Riders

Environmental Organizations

- Greenbelt Alliance
- Coalition for Clean Air

5 Appendices

A. Letters of Support
B. GHG Emissions Modeling and Methodology
C. Ridership Modeling and Methodology
D. Outreach to Disadvantaged and Low Income Communities
E. Role of BART in the Region (not attached)
F. Plan Bay Area 2040 (Sustainable Communities Strategy) (not attached)
G. MTC Bay Area Core Capacity Transit Study (not attached)
H. BART Strategic Energy Plan
I. BART Rider Demographics
J. BART Public Participation Plan
K. Categorical Exclusion
L. BART Confirmation of Entry into Engineering for Transbay Corridor Core Capacity Program

METROPOLITAN
TRANSPORTATION
COMMISSION

Bay Area Metro Center
375 Beale Street, Suite 800
San Francisco, CA 94105
415.778.6700
www.mtc.ca.gov

January 8, 2020

Mr. Chad Edison
Chief Deputy Secretary, Rail and Transit
California State Transportation Agency
915 Capitol Mall, Suite 350B
Sacramento, CA 95814-4801

RE: 2020 Transit and Intercity Rail Capital Program Application from Bay Area Rapid Transit – Consistency with Regional Sustainable Communities Strategy

Dear Mr. Edison:

The Metropolitan Transportation Commission (MTC) is the Metropolitan Planning Organization (MPO) for the nine-county Bay Area. Our current regional Sustainable Communities Strategy, *Plan Bay Area 2040*, was adopted in July 2017.

We have reviewed Bay Area Rapid Transit's planned application for the 2020 Transit and Intercity Rail Capital Program, *Transbay Corridor Core Capacity Program*, and confirm that it is consistent with Plan Bay Area 2040.

Please feel free to contact me with any questions.

Sincerely,

Ross McKeown
Acting Section Director,
Programming and Allocations

CC: Richard Fuentes, Bay Area Rapid Transit, rfuente@bart.gov

RM:AS
J:\PROJECT\Funding\Cap and Trade\TIRCP\TIRCP 2020\SCS Consistency Letters\Letters\BART.docx

California Legislature

STATE CAPITOL
SACRAMENTO, CALIFORNIA

January 10, 2020

The Honorable David Kim
Secretary
California State Transportation Agency
915 Capital Mall, Suite 350B
Sacramento, CA 94814

Subject: Bay Area Rapid Transit District's application to California's Transit and Intercity Rail Capital Program

Dear Secretary Kim:

As representatives of the San Francisco Bay Area, we are writing in support of the San Francisco Bay Area Rapid Transit District (BART) application to the State of California's 2020 Transit and Intercity Rail Capital Program (TIRCP) for the **Transbay Corridor Core Capacity Project**. Once complete, BART's Core Capacity Project will positively impact a crucial portion of the transportation system serving the Bay Area, and benefit the health and quality of life of our residents by encouraging mass transit use, reducing roadway congestion, and eliminating harmful emissions and greenhouse gases.

BART ridership has grown significantly over the past decade. Additional substations, new rail cars, an expanded maintenance facility, and a new train control system, will ensure that BART, and transit in the Bay Area, remains a viable alternative to driving. In order to meet projected rider demand, the Transbay Corridor Core Capacity Project will increase capacity between San Francisco and Oakland by more than 30 percent, encouraging drivers to leave their cars at home and greatly reducing vehicle miles traveled. This project will help to relieve crowding on BART trains, improve the quality of service, and encourage additional use of our transit system.

In addition, the many disadvantaged communities (DACs) located along the BART system will benefit from reduced crowding as well as reduced particulate emissions and greenhouse gases from less drivers on the road. Several of the Bay Area's priority development areas are centered around BART stations, and this project supports additional transit capacity that will enable these areas to grow, helping to realize the Bay Area's Sustainable Communities Strategy and other concurrent community, health, and environmental efforts in the region.

BART's Transbay Corridor Core Capacity Project also supports the Governor's Executive Order on Climate Change, which calls for every aspect of state government to redouble efforts to "reduce greenhouse gas emissions and mitigate the impacts of climate change while building a sustainable, inclusive economy."

We fully support BART in its efforts to bring these additional benefits to the Bay Area. Thank you for your thoughtful consideration of this regionally important project.

Sincerely,

David Chiu AD17

Robert A. Wieckowski SD 10

AD19

Scott Wiener

Steve Glazer

Bonnie Lee AD15

AD

Nancy Skinner

Kevin Mullin AD22

Jerry Hill SD 13

Kansen Chu AD 25

Jim Beall SD 15

Tim Simpson AD 14

Bill Dodd AD 20

Rob Bonta AD 18

AD 16

January 10, 2020

BART application to the California Transit and Intercity Rail Capital Program

Signatures on the previous pages are as follows:

David Chiu
Assembly Member, 17th District

Bob Wieckowski
Senator, 10th District

Philip Ting
Assembly Member, 19th District

Scott Wiener
Senator, 11th District

Steven Glazer
Senator, 7th District

Buffy Wicks
Assembly Member, 15th District

Philip Ting
Assembly Member, 19th District

Nancy Skinner
Senator, 9th District

Kevin Mullin
Assembly Member, 22nd District

Jerry Hill
Senator, 13th District

Kansen Chu
Assembly Member, 25th District

Jim Beall
Senator, 15th District

Tim Grayson
Assembly Member, 14th District

Bill Quirk
Assembly Member, 20th District

Ash Kalra
Assembly Member, 27th District

Rob Bonta
Assembly Member, 18th District

Rebecca Bauer-Kahan
Assembly Member, 16th District

**San Francisco
County Transportation
Authority**

1455 Market Street, 22ND Floor, San Francisco, California 94103 415-522-4800 info@sfcta.org www.sfcta.org

January 9, 2020

Secretary David S. Kim
California State Transportation Agency
915 Capitol Mall, Suite 350B
Sacramento, CA 95814

Re: Support for the Bay Area Rapid Transit District's application to California's Transit and Intercity Rail Capital Program

Dear Secretary Kim,

On behalf of the San Francisco County Transportation Authority, I am writing to express our support of the Bay Area Rapid Transit's (BART's) application to the California State Transportation Agency's 2020 Transit and Intercity Rail Capital Program for their Transbay Corridor Core Capacity Project. Once complete, BART's Core Capacity Project will improve the reliability and capacity of the transbay tube, a crucial component of the Bay Area's regional transportation network, and will benefit the health and quality of life of residents by reducing greenhouse gas emissions and encouraging mass transit options.

The mission of the San Francisco County Transportation Authority (SFCTA) is to make travel safer, healthier, and easier for all. We plan, fund, and deliver local and regional projects to improve travel choices for residents, commuters, and visitors throughout the city, and we serve as San Francisco County's Congestion Management Agency (CMA). With BART ridership growing significantly over the past decade, trains are becoming crowded. New rail cars, in addition to an associated maintenance facility, train control system, and additional substations will play an integral role in ensuring that transit remains a viable alternative to driving through this corridor and the overall system.

To meet BART's increased need, the comprehensive and coordinated package of investments that is the Transbay Corridor Core Capacity Project will increase capacity between San Francisco and Oakland by more than 30 percent, encouraging drivers to leave their cars at home. This project will reduce vehicle miles traveled by improving the quality of service, reducing crowding for riders, and supporting continued growth of the BART system. The many disadvantaged communities (DACs) located along the BART system will benefit from increased capacity and reduced crowding, as well as reduced greenhouse gas emissions from less drivers on the road. Finally, this project supports additional transit capacity that will enable many of the region's priority development areas to grow, which will help to realize the Bay Area's Sustainable Communities Strategy and other concurrent community, health, and environmental efforts in the region.

I respectfully urge CalSTA to provide funding support for this crucial project, to help minimize greenhouse gas emissions and improve mobility for current and future transit riders. Thank you in advance for your consideration of this project.

Sincerely,

Tilly Chang, Executive Director
San Francisco County Transportation Authority

CITY OF OAKLAND

1 FRANK H. OGAWA PLAZA · 3RD FLOOR · OAKLAND, CALIFORNIA 94612

Office of the Mayor
Libby Schaaf
Mayor

(510) 238-3141
FAX: (510) 238-4731
TDD: (510) 238-3254

January 10, 2020

Secretary David Kim
California State Transportation Agency
915 Capital Mall, Suite 350B
Sacramento, CA 94814
Subject: Bay Area Rapid Transit District's application to California's Transit and Intercity Rail Capital Program

Dear Mr. Kim:

On behalf of the City of Oakland, I am writing in support of Bay Area Rapid Transit's (BART) application to the State of California's 2020 Transit and Intercity Rail Capital Program for the **Transbay Corridor Core Capacity Project**. Once complete, BART's Core Capacity Project will positively impact a crucial portion of the transportation system serving the Bay Area, as well as benefit the health and quality of life of residents by reducing greenhouse gas emissions and encouraging mass transit options.

Oakland sits at the crossroads of the region and relies heavily on the critical services provided by BART. As we work to address the housing crisis and rising homelessness, we continue to strive to build more housing near transportation, including BART stations. With BART ridership growing significantly over the past decade, trains are becoming crowded. New rail cars, in addition to an associated maintenance facility, train control system, and additional substations will play an integral role in ensuring that transit remains a viable alternative to driving through this corridor and the overall system. In order to meet this increased need, the comprehensive and coordinated package of investments that is the Transbay Corridor Core Capacity Project will increase capacity between San Francisco and Oakland by more than 30 percent, encouraging drivers to leave their cars at home. This project will reduce vehicle miles traveled by improving the quality of service, reducing crowding for riders, and supporting continued growth of the BART system. The many disadvantaged communities (DACs) located along the BART system will benefit from increased capacity and reduced crowding, as well as reduced greenhouse gas emissions from less drivers on the road. Several of the Bay Area's priority development areas are centered around BART stations, and this project supports additional transit capacity that will enable these areas to grow, which will help to realize the Bay Area's Sustainable Communities Strategy and other concurrent community, health, and environmental efforts in the region.

The City of Oakland fully support BART in its efforts to bring these additional benefits to the Bay Area. If you have any questions regarding our support, please reach out to me directly. Thank you in advance for your consideration of this project.

Sincerely,

Libby Schaaf
Mayor
City of Oakland

ALAMEDA
County Transportation Commission

1111 Broadway, Suite 800, Oakland, CA 94607 • 510.208.7400 • www.AlamedaCTC.org

January 13, 2020

Secretary David Kim
California State Transportation Agency
915 Capital Mall, Suite 350B
Sacramento, CA 94814

Subject: Bay Area Rapid Transit District's application to California's Transit and Intercity Rail Capital Program

Dear Secretary Kim,

On behalf of the Alameda County Transportation Commission (Alameda CTC), I am writing in support of Bay Area Rapid Transit's (BART) application to the State of California's 2020 Transit and Intercity Rail Capital Program for the **Transbay Corridor Core Capacity Project**. Once complete, BART's Core Capacity Project will positively impact a crucial portion of the transportation system serving the Bay Area, as well as benefit the health and quality of life of residents by reducing greenhouse gas emissions and encouraging mass transit options.

With BART ridership growing significantly over the past decade, trains are becoming crowded. New rail cars, in addition to an associated maintenance facility, train control system, and additional substations will play an integral role in ensuring that transit remains a viable alternative to driving through this corridor and the overall system. In order to meet this increased need, the comprehensive and coordinated package of investments that is the Transbay Corridor Core Capacity Project will increase capacity between San Francisco and Oakland by more than 30 percent, encouraging drivers to leave their cars at home. This project will reduce vehicle miles traveled by improving the quality of service, reducing crowding for riders, and supporting continued growth of the BART system. The many disadvantaged communities (DACs) located along the BART system will benefit from increased capacity and reduced crowding, as well as reduced greenhouse gas emissions from less drivers on the road. Several of Alameda County's priority development areas are centered around BART stations, and this project supports additional transit capacity that will enable these areas to grow, which will help to realize the Bay Area's Sustainable Communities Strategy and other concurrent community, health, and environmental efforts in the region.

If you have any questions, please contact Carolyn Clevenger (510.208.7496, cclevenger@alamedactc.org). Thank you in advance for your consideration of this project.

Sincerely,

Tess Lengyel
Executive Director, Alameda County Transportation Commission

CONTRA COSTA
transportation
authority

January 10, 2020

Secretary David Kim
California State Transportation Agency
915 Capital Mall, Suite 350B
Sacramento, CA 94814

Subject: Support of Bay Area Rapid Transit (BART) District's Transbay Corridor Core Capacity Project Application – California's Transit and Intercity Rail Capital Program (TIRCP)

Dear Mr. Kim:

I am writing in support of the Transbay Corridor Core Capacity project grant application submitted by BART. The Contra Costa Transportation Authority (Authority) supports the Transbay Corridor Core Capacity project, which will positively impact a crucial portion of the transportation system serving the Bay Area, as well as benefit the health and quality of life of residents by reducing Greenhouse Gas (GHG) emissions and encouraging mass transit options.

With BART ridership growing significantly over the past decade, trains are becoming crowded. New rail cars, in addition to an associated maintenance facility, train control system, and additional substations will play an integral role in ensuring that transit remains a viable alternative to driving through this corridor and the overall system. In order to meet this increased need, the comprehensive and coordinated package of investments that is the Transbay Corridor Core Capacity project will increase capacity between the Cities of San Francisco and Oakland by more than 30 percent, encouraging drivers to leave their cars at home. This project will reduce Vehicle Miles Traveled (VMT) by improving the quality of service, reducing crowding for riders, and supporting continued growth of the BART system. The many Disadvantaged Communities (DACs) located along the BART system will benefit from increased capacity and reduced crowding, as well as reduced GHG emissions from less drivers on the road. Several of the Bay Area's priority development areas are centered around BART stations. This project supports additional transit capacity that will enable these areas to grow, which will help to realize the Bay Area's Sustainable Communities Strategy and other concurrent community, health, and environmental efforts in the region.

The Transbay Corridor Core Capacity project is worthy of grant funding as it provides significant transportation benefits to the region. The Authority fully supports BART in its efforts to bring these additional benefits to the Bay Area.

Sincerely,

Randell H. Iwasaki
Executive Director

2999 Oak Road
Suite 100
Walnut Creek
CA 94597
PHONE: 925.256.4700
FAX: 925.256.4701
www.ccta.net

EAST BAY ASIAN LOCAL
DEVELOPMENT CORPORATION

BUILDING HEALTHY, VIBRANT AND SAFE NEIGHBORHOODS

NeighborWorks® CHARTERED MEMBER

Dec 6th, 2019

Secretary David Kim
California State Transportation Agency
915 Capital Mall, Suite 350B
Sacramento, CA 94814

Re: Bay Area Rapid Transit District's application to California's Transit and Intercity Rail Capital Program

Dear Mr. Kim,

On behalf of East Bay Asian Local Development Corporation, I am writing in support of Bay Area Rapid Transit's (BART) application to the State of California's 2020 Transit and Intercity Rail Capital Program for the **Transbay Corridor Core Capacity Project**. Once complete, BART's Core Capacity Project will positively impact a crucial portion of the transportation system serving the Bay Area, as well as benefit the health and quality of life of residents by reducing greenhouse gas emissions and encouraging mass transit options.

East Bay Asian Local Development Corporation is a 501(c)(3) nonprofit community development corporation that works with and for the diverse populations of the East Bay to build healthy, vibrant and safe neighborhoods. Building affordable housing and mixed used developments is a large part of our work, and we develop in transit-friendly locations so that our residents can have access to jobs, education, healthcare, and other opportunities for health and success in their lives.

With BART ridership growing significantly over the past decade, trains are becoming crowded. New rail cars, in addition to an associated maintenance facility, train control system, and additional substations will play an integral role in ensuring that transit remains a viable alternative to driving through this corridor and the overall system. In order to meet this increased need, the comprehensive and coordinated package of investments that is the Transbay Corridor Core Capacity Project will increase capacity between San Francisco and Oakland by more than 30 percent, encouraging drivers to leave their cars at home. This project will reduce vehicle miles traveled by improving the quality of service, reducing crowding for riders, and supporting continued growth of the BART system. The many disadvantaged communities (DACs) located along the BART system will benefit from increased capacity and reduced crowding, as well as reduced greenhouse gas emissions from less drivers on the road. Several of the Bay Area's priority development areas are centered around BART stations, and this project supports additional transit capacity that will enable these areas to grow, which will help to realize the Bay Area's Sustainable Communities Strategy and other concurrent community, health, and environmental efforts in the region.

We support BART in its efforts to ensure reliable public transportation for the residents in the Bay Area. If you have any questions regarding our support, please reach out to me directly. Thank you in advance for your consideration of this project!

Sincerely,

Joshua Simon,
Chief Executive Officer
East Bay Asian Local Development Corporation

THE UNITY COUNCIL

Friday, December 20, 2019

Secretary David Kim
California State Transportation Agency
915 Capital Mall, Suite 350B
Sacramento, CA 94814

Subject: Bay Area Rapid Transit District's application to California's Transit and Intercity Rail Capital Program

Dear Mr. Kim:

On behalf of The Unity Council, I am writing in support of Bay Area Rapid Transit's (BART) application to the State of California's 2020 Transit and Intercity Rail Capital Program for the **Transbay Corridor Core Capacity Project**. Once complete, BART's Core Capacity Project will positively impact a crucial portion of the transportation system serving the Bay Area, as well as benefit the health and quality of life of residents by reducing greenhouse gas emissions and encouraging mass transit options.

The Unity Council is a non-profit Social Equity Development Corporation with a 55-year history in the Fruitvale neighborhood of Oakland. Our mission is to promote social equity and improve quality of life by building vibrant communities where everyone can work, learn, and thrive.

With BART ridership growing significantly over the past decade, trains are becoming crowded. New rail cars, in addition to an associated maintenance facility, train control system, and additional substations will play an integral role in ensuring that transit remains a viable alternative to driving through this corridor and the overall system. In order to meet this increased need, the comprehensive and coordinated package of investments that is the Transbay Corridor Core Capacity Project will increase capacity between San Francisco and Oakland by more than 30 percent, encouraging drivers to leave their cars at home. This project will reduce vehicle miles traveled by improving the quality of service, reducing crowding for riders, and supporting continued growth of the BART system. The many disadvantaged communities (DACs) located along the BART system will benefit from increased capacity and reduced crowding, as well as reduced greenhouse gas emissions from less drivers on the road. Several of the Bay Area's priority development areas are centered around BART stations, and this project supports additional transit capacity that will enable these areas to grow, which will help to realize the Bay Area's Sustainable Communities Strategy and other concurrent community, health, and environmental efforts in the region.

The Unity Council fully supports BART in its efforts to bring these additional benefits to the Bay Area. If you have any questions regarding The Unity Council's support, please reach out to me directly. Thank you in advance for your consideration of this project.

Sincerely,

Chris Iglesias
Chief Executive Officer

The Unity Council
1900 Fruitvale Ave Ste 2A, Oakland, CA 94601
510-535-6900 Office · 510-534-7771 Fax · www.unitycouncil.org

ASIAN HEALTH SERVICES
ADMINISTRATIVE OFFICES
101 8th Street, Suite 100 | Oakland, CA 94607 | 510-735-3100

December 6, 2019

Secretary David Kim
California State Transportation Agency
915 Capital Mall, Suite 350B
Sacramento, CA 94814
Subject: Bay Area Rapid Transit District's application to California's Transit and Intercity Rail Capital Program

Dear Mr. Kim:

On behalf of Asian Health Services, I am writing in support of Bay Area Rapid Transit's (BART) application to the State of California's 2020 Transit and Intercity Rail Capital Program for the **Transbay Corridor Core Capacity Project**. Once complete, BART's Core Capacity Project will positively impact a crucial portion of the transportation system serving the Bay Area, as well as benefit the health and quality of life of residents by reducing greenhouse gas emissions and encouraging mass transit options.

A rich and dynamic community, Oakland Chinatown has thrived over the years as the primary neighborhood of the Lake Merritt BART Station. Asian Health Services, and the Chinatown extended community, shares a collective vision of an intentional holistic neighborhood that engages residents and visitors to live, work, and play. We are working actively with BART to create a vibrant culture for Chinatown that is distinctly 'Oakland', and to establish a distinct "community thumbprint" that extends the legacy and current Asian community core that is Oakland Chinatown. AHS has worked with BART on a shared vision of a vibrant Chinatown community hub that intentionally strengthens the Asian community, helps Chinatown thrive, and engages community voices toward a cohesive and engaged neighborhood and beyond. AHS has significant experience with transportation planning projects. As one of the lead agencies of the *Revive Chinatown!* Project, AHS lead a partnership of organizations and agencies to improve pedestrian safety in Chinatown.

With BART ridership growing significantly over the past decade, trains are becoming crowded. New rail cars, in addition to an associated maintenance facility, train control system, and additional substations will play an integral role in ensuring that transit remains a viable alternative to driving through this corridor and the overall system. In order to meet this increased need, the comprehensive and coordinated package of investments that is the Transbay Corridor Core Capacity Project will increase capacity between San Francisco and Oakland by more than 30 percent, encouraging drivers to leave their cars at home. This project will reduce vehicle miles traveled by improving the quality of service, reducing crowding for riders, and supporting continued growth of the BART system. The many disadvantaged communities (DACs) located along the BART system will benefit from increased capacity and reduced crowding, as well as reduced greenhouse gas emissions from less drivers on the road. Several of the Bay Area's priority development areas are centered around BART stations, and this project supports additional transit capacity that will enable these areas to grow, which will help to realize the Bay Area's Sustainable Communities Strategy and other concurrent community, health, and environmental efforts in the region.

Asian Health Services fully supports BART in its efforts to bring these additional benefits to the Bay Area. If you have any questions regarding Asian Health Services' support, please reach out to me directly. Thank you in advance for your consideration of this project.

Sincerely,

Sherry Hirota, *CEO*
Asian Health Services

capital for healthy
families & communities

December 23, 2019

Secretary David Kim
California State Transportation Agency
915 Capital Mall, Suite 350B
Sacramento, CA 94814

Subject: Bay Area Rapid Transit District's application to California's Transit and Intercity Rail Capital Program

Dear Mr. Kim:

On behalf of the Low Income Investment Fund (LIIF), I am writing in support of Bay Area Rapid Transit's (BART) application to the State of California's 2020 Transit and Intercity Rail Capital Program for the **Transbay Corridor Core Capacity Project**. Once complete, BART's Core Capacity Project will positively impact a crucial portion of the transportation system serving the Bay Area, as well as benefit the health and quality of life of residents by reducing greenhouse gas emissions and encouraging mass transit options.

Transit-oriented development (TOD) is a primary focus area for LIIF. We use our expertise to leverage public and private dollars to provide our community-based partners and mission-driven developers innovative financing solutions that address the unique and complex challenges of TOD projects. Since our inception, LIIF has deployed over $206MM to support TOD initiatives; in the process, we have helped create over 13,000 TOD affordable housing units.

BART's proposed Transbay Corridor Core Capacity Project will play an integral role in ensuring that public transit remains a viable alternative to driving throughout the Bay Area. The project will reduce the traveled vehicle miles for commuters, address the overcrowding issue for riders and support continued growth of the BART system. It will also be advantageous to the many disadvantaged communities (DACs) located along the BART system, as they benefit from increased capacity and reduced crowding, as well as reduced greenhouse gas emissions from less drivers on the road.

LIIF supports BART's efforts to bring these additional benefits to the Bay Area. If you have any questions regarding LIIF's support, please reach out to me directly. Thank you in advance for your consideration of this project.

Sincerely,

Dan Nissenbaum
CEO

Low Income Investment Fund
50 California Street
Suite 2900
San Francisco, CA 94111

415.772.9094 tel
415.772.9095 fax
www.liifund.org

San Francisco
Los Angeles
New York
Washington, D.C.

APPENDIX B. GREENHOUSE GAS EMISSIONS BENEFITS MODELING AND METHODOLOGY

The Transbay Corridor Core Capacity Program will allow the number of trains operating through the Transbay Tube and train lengths to be increased, offering Bay Area residents and workers increased service frequency, greater capacity, and reduced crowding. This will lead to increases in transit ridership and reductions in greenhouse gas (GHG) emissions. GHG emissions benefits from transit projects are quantified by using estimates for new transit ridership to calculate a reduction in vehicle miles traveled (VMT) by single occupancy vehicles on roadways. The required tool for this analysis is the California Air Resources Board (CARB) Benefits Calculator Tool for the Transit and Intercity Rail Capital Program, most recently updated in October 2019. (https://ww2.arb.ca.gov/resources/documents/cci-quantification-benefits-and-reporting-materials)

The GHG benefit was determined using the spreadsheet-based tool to estimate the decrease in GHG emissions based on the projected increase in BART ridership, as well as the increase in GHG emissions due to the energy used to operate the additional service. GHG benefits were also estimated for additional Bay Area transit ridership increases due to implementation of the Core Capacity Program. The co-benefits of emissions reductions of other air pollutants from vehicle exhaust were also reported.

UPDATES SINCE 2018 APPLICATION

This 2020 TIRCP application is requesting funding for the remaining 34 vehicles out of the 306 necessary to realize the benefits of the Core Capacity Program. The model referenced in this Appendix and attached to this application includes the 2018 TIRCP funding associated with the Core Capacity Program ($318 million), and delineates the total Core Capacity Program benefits, as well as the benefits associated with this 2020 request for the remaining 34 vehicles.

PROJECT DATA

Project specific data was input into the tool to determine the GHG emissions benefit of the project. This project will increase ridership on the Bay Area Rapid Transit heavy rail system, and other Bay Area transit service, as described in the benefits to ridership section and Appendix C. Ridership Modeling and Methodology.

The proposed improvements to the BART core capacity system will have a useful life of 50 years. This 50-year useful life is based on the expected service life of all elements of the BART Core Capacity Program, not just the vehicles.

DAILY RIDERSHIP

The daily ridership was estimated for the first year of the project (2031) and the final year of the project (2080, assuming a 50-year useful life). The ridership increase due to the project was determined and is detailed in **Appendix C** of this application, and includes ridership increases on BART as well as other Bay Area transit services. An annualization factor of 291.5 was applied to account for weekend ridership, based on average weekday and annual ridership projections prepared by BART.

WSP USA
17th Floor
425 Market Street
San Francisco, CA 94105

Tel.: +1 415 243 4600
Fax: +1 916 243-9501
wsp.com

TABLE 1 ANNUAL RIDERSHIP DUE TO PROJECT

	BART Yr1 2031	BART YrF 2080	Other Bay Area Transit Yr1 2031	Other Bay Area Transit YrF 2080
Daily Ridership Increase due to Project	151,172	202,972	49,012	65,806
BART Annualization Factor	291.5	291.5	291.5	291.5
Annual Ridership Increase due to Project	44,066,638	59,166,338	14,287,004	19,182,532

The ridership from Table 1 was input into the tool. Since many trips in the project vicinity are already taken by transit, every new rider would not necessarily be a displaced passenger vehicle trip. Therefore, to avoid overpredicting the reduction in passenger vehicle trips, an Adjustment Factor was used to account for transit-dependent riders. The Adjustment Factor used for the BART service was 0.87, which is the recommended default for commuter rail service. An average trip length of 13.72 miles, the recommended default for the Bay Area Rapid Transit District, was used as the basis for the estimated reduction in VMT. The Bay Area transit ridership is based on a combination of local bus, express bus, light rail, heavy rail, and ferry service. The tool's default values for local bus service were used as a conservative approach to avoid overestimating the benefits. The local bus default values used were an Adjustment Factor of 0.561 and an average trip length of 3.77 miles.

The reduction in GHG emissions is somewhat offset by the increase in emissions from the generation of electricity required to operate the additional service. This increased electricity usage and associated emissions are calculated by the analysis tool using an estimate of annual rail miles traveled of the new service. The annual rail miles traveled were estimated by determining the No Build Scenario train miles and the updated trail miles with the Core Capacity Program, and using the difference. The Operations and Maintenance Report that includes this information can be submitted as needed. It should be noted that the estimated energy usage is based on defaults within the software program; GHG emissions from electricity generation would likely be lower in the future based upon plans to purchase a higher percentage of energy from renewable sources.

PROJECT BENEFITS

Using the information presented above as inputs, the tool estimated a total of 6,767,159 metric tons of carbon dioxide equivalent ($MTCO_2e$) would be reduced by the project over a 50-year period, with 2,222,649 metric tons attributable to the current TIRCP funding request.

The Annual auto VMT reduced due to the project was estimated by the tool using the formula below.

*AutoVMT = [(R) * (A) * (L)]*

Where,

R = annual increase in passenger trips (riders)

A = Adjustment factor to account for transit dependency (unitless)

L = Estimated length of project (miles/rider)

Using the ridership values summarized in Table 1, the annual VMT reduced due to the project ranged from 556,159,741 miles in 2031 to 746,731,238 miles in 2080, for a total of 31,819,818,205 VMT reduced over life of the project.

GHG reductions will be realized in the opening year (2031), and they will continue each year during the useful life of the BART core capacity service. There would be an average of 138,105 $MTCO_2e$ reduced each year; however, this value will vary from year to year as ridership grows on the affected routes and passenger vehicle fuel economy continues to improve. The reductions in GHG emissions from this project would contribute to statewide GHG reductions required by Assembly Bill 32.

There would also be a reduction in emissions of other air pollutants, known as criteria pollutants, found in vehicle exhaust. The estimated reductions in these federally regulated criteria pollutants would reduce the exposure of residents, workers, and students in the project area to pollutants that the EPA has identified to be harmful to both public health and the environment. The Clean Air Act requires that the EPA publish a list of all geographic areas in compliance with the National Ambient Air Quality Standards (NAAQS) for criteria pollutants, and those not attaining the NAAQS. Areas not in NAAQS compliance are deemed nonattainment areas. Areas that have insufficient data to make a determination are deemed unclassified, and are treated as being attainment areas until proven otherwise. A maintenance area is an area that was previously designated as nonattainment for a particular pollutant, but has since demonstrated compliance with the NAAQS for that pollutant. An area's designation is based on data collected by the state monitoring network on a pollutant-by-pollutant basis. The project area has been designated by EPA as nonattainment for federal ozone and fine particulate ($PM_{2.5}$) standards, and maintenance for federal carbon monoxide (CO) standards. The emissions reductions from this project will contribute to efforts to decrease emissions of these pollutants, as well as their precursors, in the area.

A summary of all estimated emissions benefits is provided in Table 2. These values represent the total emissions reduced over the project life of 50 years. The average annual emission reduction varies widely year to year, as emission factors are declining over time due to improvements in vehicle technology, fuel composition, and federal fuel economy regulations. **Emissions reductions are presented for the Program as a whole, as well as the percentage funded by this 2020 TIRCP request.**

TABLE 2 TOTAL PROJECT EMISSIONS REDUCTIONS FROM 2031 TO 2080

Pollutant	Total Core Capacity Program Emissions Reduced	2020 TIRCP Request Emissions Reduced
Carbon Dioxide Equivalent (CO_2e)	6,767,159 metric tons	2,222,649 metric tons
Reactive Organic Gases (ROG)	205,396 pounds	64,078 pounds
Oxides of Nitrogen (NO_X)	1,434,835 pounds	447,629 pounds
Fine Particulate Matter ($PM_{2.5}$)	1,290,671 pounds	402,654 pounds
Diesel Particulate Matter (DPM)	1,598 pounds	498 pounds

APPENDIX C. TRANSBAY CORE CAPACITY PROGRAM RIDERSHIP FORECAST

TECHNICAL REFERENCE MATERIAL

The Transbay Corridor Core Capacity Program of the Bay Area Rapid Transit District (BART) will increase the throughput capacity in the most heavily used part of the BART system by increasing the number of trains operating through the Transbay Tube and the number of cars on those trains. This technical memorandum reports the projected ridership gains expected from the increased number of trains and train lengths, and describes the data, assumptions and methodology used to develop BART ridership projections.

Additionally, the ridership increases on the BART system that are attributed to the Core Capacity Program also will bolster increased ridership on other transit systems in the Bay Area (ex: Muni, AC Transit, etc). This analysis is also included in the ridership and GHG emissions modeling as part of the 2020 TIRCP application.

Hence, this technical document is split into two sections:

1. BART ridership increases from the Core Capacity Program (based on 2018 TIRCP ridership analysis) with 2020 updates.
2. Bay Area transit ridership increases from the Core Capacity Program (new as of 2020 TIRCP ridership analysis)

Both analyses feed into the GHG Emissions Modeling as part of the 2020 TIRCP application. See Appendix B. Greenhouse Gas Emissions Benefits Modeling and Methodology for more information.

INTRODUCTION

On the main trunk of the its system, from the Oakland wye through the Transbay Tube to Daly City, BART currently operates a maximum of 23 trains per hour in the peak direction, with an average of 8.9 cars per train, for a total of 204.9 cars per hour.

The Transbay Corridor Core Capacity Program includes four elements: acquisition of 306 new rail cars, construction of Hayward Maintenance Complex Phase 2 storage facility, installation of communications-based train control system, and creation of five new traction power substations. Collectively, these four elements will allow BART to increase the service frequency from four trains per hour to five trains per hour on each of BART's five rail lines, and to operate 30 trains per hour, with an average of 10 cars per train, for a total of 300 cars per hour during the peak period through the Transbay Tube.

BART anticipates completing implementation in late FY 2030, with FY 2031 as the first full year of increased frequency operations from the completed Core Capacity Program.

BART RIDERSHIP INCREASES FROM CORE CAPACITY PROGRAM

UPDATES TO THIS BART RIDERSHIP ANALYSIS SINCE 2018

As noted above, the following BART ridership increases from the Core Capacity Program are based on BART's 2018 TIRCP application. The following BART ridership analysis is based on capacity increases as part of the Core Capacity Program. As these ridership gains assume that ridership will increase to meet new capacity due to implementation of the Program, a new BART ridership analysis has not been undertaken. Instead, this 2020 application relies on the ridership analysis conducted in 2018.

BART's 2018 award of $318.6 million claimed benefits for the CBTC system and 272 of the new cars necessary to realize the overall ridership benefits described here (306 total). This 2020 TIRCP application is requesting $119 million to fund the remaining 34 cars necessary to realize the ridership benefits described below. This 2020 analysis relies on the CARB GHG emissions calculator to apportion the GHG benefits to this application (34 Vehicles) using

its built-in ability to note the amount of funding received from previous or other programs that rely on Cap-and-Trade funding.

The ridership benefits derived from the Core Capacity Program cannot be parsed, as only the full CBTC system and 306 Vehicles make the capacity increase possible. However, CARB's GHG emissions calculator allows us to apportion the GHG benefits for the 34 Vehicles appropriately from the overall CBTC system implementation and 306 total cars. For more on this apportionment of GHG benefits, please see the GHG Emissions Memo for more information.

DATA

The projected BART ridership in this memorandum is primarily based on the following two data sets.

1. BART Ridership Forecast for FY 2018 through FY 2040 (see Table 1), which includes average weekday and total annual systemwide ridership, made available by the BART staff, and
2. BART Monthly Ridership Reports, providing actual average ridership by type of day (weekday, Saturday, and Sunday), available on BART website at http://bart.gov/ridership

ASSUMPTIONS

The projections are based on the following assumptions.

1. The horizon year for the 2020 TIRCP ridership projection is FY 2080. This is based on a planning horizon of 50 years, with FY 2031 as the first full year of operations after the completion of the Core Capacity Program. The Core Capacity Program includes acquisition of vehicles, civil construction and the installation of systems that are expected to have an average service life of 50 years, based on BART experience with existing facilities and equipment. BART experience includes mid-life overhaul of vehicles to extend their service life.
2. The average weekday systemwide ridership of 435,973, recorded in June 2016, is constrained by the capacity of the current system.

METHODOLOGY

The major steps in the process for developing the projected ridership for the Core Capacity Program are as follows:

EXISTING RIDERSHIP

During peak periods on weekdays, current ridership exceeds capacity in the Transbay Corridor. The average weekday systemwide ridership of 435,973, recorded in June 2016, occurred at a time when BART ridership was exceeding capacity in the Transbay Corridor during the peak periods. Analyses performed by BART for the Federal Transit Administration (FTA) found that the average amount of floor space per passenger was less than 5.4 square feet – the crowding standard FTA has adopted for Core Capacity funding based upon TCRP Transit Capacity and Quality of Service Manual – during the peak hour between the Embarcadero station in San Francisco and the Berkeley, Rock Ridge, and Bay Fair stations in the East Bay. Figure 1 illustrates the results of BART's analysis for FTA.

Figure 1. Square Feet per Passenger in AM Peak Hour

To predict the ridership benefits of the Transbay Core Capacity Program, the June 2016 level of 435,973 riders per day was established as the constrained baseline, as further described below. The capacity of the system through the Transbay Tube will stay constrained until the completion of the Core Capacity Program.

UNCONSTRAINED RIDERSHIP FORECAST TO FY 2040

BART has developed ridership forecast for FY 2018 to FY 2040. The forecast accounts for increases in ridership over time that can be expected to result from anticipated population and employment growth and system expansion, such as the BART extension to Silicon Valley and the eBART extension in eastern Contra Costa County. However, the BART ridership forecast does not account for ridership gains from the increased service frequency and train lengths that will result from the Core Capacity Program. In addition, the forecast is not constrained by the capacity of the BART system. The forecast average weekday systemwide unconstrained ridership for the first year of BART forecast (FY 2018), the first full year of operations after the completion of the Core Capacity Program (FY 2031), and the last year of BART forecast (FY 2040) are 431,079, 539,903and 621,873, respectively.

See Table 1 below and Table 3, Column ‘BART Forecast.’

Table 1. BART Ridership Forecast (FY 2018 – FY 2040)

	Average Weekday Passenger Trips				Total Annual Trips			
Year	**Core**	**SFO Extension**	**SBVX+SVSX**	**Total**	**Core**	**SFO Extension**	**SBVX+SVSX**	**Total**
FY18	374,997	50,028	6,684	**431,709**	109,180,489	14,725,847	1,945,943	125,852,279
FY19	374,555	50,079	16,283	440,917	109,051,546	14,740,857	4,740,890	128,533,293
FY20	382,516	51,276	19,440	453,232	111,369,406	15,093,017	5,660,088	132,122,511
FY21	389,620	52,059	22,848	464,527	113,437,952	15,323,709	6,652,103	135,413,764
FY22	396,092	52,878	26,521	475,491	115,322,214	15,564,600	7,721,679	138,608,493
FY23	400,706	53,658	27,708	482,072	116,665,671	15,794,108	8,067,127	140,526,907
FY24	405,380	54,458	28,948	488,786	118,026,489	16,029,566	8,428,263	142,484,318
FY25	410,118	55,271	30,245	495,633	119,405,791	16,268,878	8,805,809	144,480,478
FY26	415,047	56,108	31,601	502,755	120,840,836	16,515,431	9,200,521	146,556,788
FY27	420,032	56,956	33,018	510,006	122,292,347	16,764,908	9,613,192	148,670,447
FY28	424,846	57,823	34,500	517,169	123,693,844	17,020,267	10,044,651	150,758,763
FY29	429,722	58,709	36,049	524,480	125,113,443	17,281,133	10,495,766	152,890,343
FY30	434,583	59,605	37,669	531,858	126,528,853	17,544,779	10,967,446	155,041,078
FY31	439,993	60,547	39,363	**539,903**	128,104,062	17,821,916	11,460,641	157,386,618
FY32	445,478	61,509	41,135	548,122	129,700,931	18,105,128	11,976,348	159,782,407
FY33	451,048	62,491	42,987	556,526	131,322,696	18,394,256	12,515,609	162,232,561
FY34	456,749	63,504	44,924	565,177	132,982,443	18,692,462	13,079,516	164,754,421
FY35	462,527	64,539	46,949	574,015	134,664,649	18,997,027	13,669,212	167,330,888
FY36	468,515	65,604	49,067	583,186	136,408,249	19,310,453	14,285,893	170,004,595
FY37	474,602	66,688	51,282	592,572	138,180,307	19,629,714	14,930,813	172,740,833
FY38	480,680	67,795	53,599	602,074	139,949,986	19,955,390	15,605,282	175,510,659
FY39	486,844	68,926	56,022	611,791	141,744,691	20,288,290	16,310,676	178,343,656
FY40	493,241	70,077	58,555	**621,873**	143,607,075	20,627,158	17,048,431	181,282,665

Source: Model V

UNCONSTRAINED RIDERSHIP EXTRAPOLATED TO FY 2080

Developing the ridership projections for the Core Capacity Program requires an unconstrained ridership baseline extending up to the planning horizon of FY 2080. However, the BART forecast does not extend up to FY 2080. Therefore, BART ridership forecast is extrapolated to FY 2080 using the average growth rate for the last five years of the forecast period (FY 2036 to FY 2040), which is calculated to be 1.6 percent. This results in an average weekday systemwide unconstrained extrapolated ridership of 1,179,931 for FY 2080 (see Table 3, Column "Extrapolated").

CAPACITY-CONSTRAINED BASELINE RIDERSHIP

The current BART system does not have enough capacity to accommodate this unconstrained ridership. Therefore, the forecast and extrapolated ridership are constrained for capacity based on the June 2016 average weekday systemwide ridership of 435,973. This results in a baseline average weekday systemwide constrained ridership of 435,973 for all years except for FY 2018 (see Table 3 – Column 'No Project – Constrained').

An implicit assumption in this analysis is that the peak hour constraint will not lead to greater peak spreading, with riders switching their travel to the shoulders of the peak when the trains are less crowded, and that there will not be increased off-peak travel on BART over time. This same assumption is made in the forecast of future ridership with implementation of the Core Capacity Program.

UNCONSTRAINED RIDERSHIP WITH INCREASED FREQUENCY FROM CORE CAPACITY PROGRAM

The Core Capacity Program will allow BART to increase the service frequency by 25 percent (from four trains per hour to five trains per hour) on each of the five lines of the entire BART system. To estimate the ridership increase associated with this increase in frequency of service, elasticity of BART ridership with respect to frequency is required.

To determine the estimated ridership increase from planned service frequency increases from the Core Capacity program, a research task was undertaken to find comparable types of transportation (modes) to BART and create a range. This research is shown in Table 1.

WSP USA
17th Floor
425 Market Street
San Francisco, CA 94105

Tel.: +1 415 243 4600
Fax: +1 916 243-9501
wsp.com

TABLE 1. FREQUENCY AND RIDERSHIP INCREASES

A 1% INCREASE IN:	*EXPECT RIDERSHIP INCREASE:*	MODE	SOURCE
Service frequency/headway elasticity	+0.5%	Transit (General)	Journal of Public Transportation, Vol. 7, No. 2, 2004 – Page 48
Service frequency for commuter rail (frequency less than 50 min	+0.4%	Commuter Rail (Maximum)	Transit Capacity and Quality of Service Manual—2nd Edition – Page 1-11
Service frequency for commuter rail (frequency less than 50 min)	+0.6%	Commuter Rail (Minimum)	Transit Capacity and Quality of Service Manual—2nd Edition – Page 1-11
Service frequency in mainly central city urban environment	+0.3%	Heavy Rail	Transit Capacity and Quality of Service Manual—2nd Edition Page 1-11
Number of peak period trains	+0.48%	BART/Heavy Rail	Fehr and Peers, 2004
Service frequency	+0.08%	London Underground/Rail Rapid Transit	Transit Cooperative Research Program, TCRP Report 95, FTA, 2003 (CHAPTER 9)
Service frequency	+.15%	Direct Frequency from LA Metro Model	Internal WSP model

A straight average was estimated to show the most likely ridership increase from a 1% increase in frequency, as well as a lower and upper bound. Results are included below:

- Low ridership growth - +0.08%
- Most likely ridership growth - +0.35%
- High ridership growth – 0.6%

Increases in ridership were not estimated for decreases in station or train crowding, increased comfort, or other potential causes in increased ridership.

Based on the most-likely elasticity of 0.35, it was estimated that the 25 percent increase in service frequency will lead to an 8.8 percent increase in ridership. Adding this to the unconstrained forecast predicted by BART leads to a projected most-likely average weekday systemwide unconstrained ridership for FY 2031, FY 2040, and FY 2080 are 587,145, 676,287, and 1,283,174, respectively (see Table 3 – Column “Most Likely – Unconstrained”).

CAPACITY-CONSTRAINED PROJECTED RIDERSHIP

The Core Capacity Program will allow BART to increase the peak hour capacity through Transbay Tube by 46.6 percent (from 204.9 cars per hour to 300 cars per hour) during the peak period. Therefore, the capacity constrained ridership after the completion of the Core Capacity Program will be 46.6 percent higher than the current capacity constrained ridership. This leads to an average weekday systemwide capacity constrained ridership of 638,945 (see Table 3 – Column "Constrained Maximum").

Applying this capacity-constrain to the projected unconstrained ridership reveals that the projected average weekday BART systemwide ridership will be constrained after FY 2037 (see Table 3 – Year 2037)

Table 2 on the following page shows the inputs and results of the Ridership Methodology.

TABLE 2. RESULTS AND STEPS FOR BART RIDERSHIP METHODOLOGY

RIDERSHIP DATA	UNIT	LOWER BOUND	UPPER BOUND	MOST LIKELY
Initial Headway (Frequency)	minutes (tph)	15 (4)		
Final Headway (Frequency)	minutes (tph)	12 (5)		
Change in Headway Frequency	percentage	25		
Frequency Ridership Elasticity	elasticity	0.08	0.60	0.35
Change in Ridership	percentage	2.0%	15.0%	8.8%
BART Forecast Total Ridership – Year 2030	average weekday trips	540 K		
First Year with Total Ridership – CONSTRAINED	Year	2041	2033	2037
Year 2031 (First Year with Frequency Change)				
BART Forecast Ridership without Frequency Change - CONSTRAINED	average weekday trips	436 K		
Projected Ridership with Frequency Change – CONSTRAINED	average weekday trips	550 K	621 K	587 K
Increase in Ridership Due to Frequency Change - CONSTRAINED	average weekday trips	114 K	185 K	151 K
Year 2080 (Horizon Year)				
BART Forecast Ridership without Frequency Change - CONSTRAINED	average weekday trips	436 K		
Projected Ridership Due to Frequency Change – CONSTRAINED	average weekday trips	639 K		
Increase in Ridership Due to Frequency Change – CONSTRAINED	average weekday trips	203 K		

TABLE 3. PROJECT BART RIDERSHIP

Fiscal Year	BART Forecast	Extrapolated	No Project - Constrained	Lower Bound - Unconstrained	Upper Bound - Unconstrained	Most Likely - Unconstrained	Constrained Maximum	Lower Bound - Constrained	Upper Bound - Constrained	Most Likely - Constrained	Increase Ridership from Core Capacity Program (No Project Constrained – Most Likely Constrained)
2018	431,709	-	**431,709**	-	-	-	-	-	-	-	-
2019	440,917	-	**435,973**	-	-	-	-	-	-	-	-
2020	453,232	-	**435,973**	-	-	-	-	-	-	-	-
2021	464,527	-	**435,973**	-	-	-	-	-	-	-	-
2022	475,491	-	**435,973**	-	-	-	-	-	-	-	-
2023	482,072	-	**435,973**	-	-	-	-	-	-	-	-

WSP USA
17th Floor
425 Market Street
San Francisco, CA 94105

Tel.: +1 415 243 4600
Fax: +1 916 243-9501
wsp.com

2024	488,786	-	**435,973**	-	-	-	-	-	-	-	-
2025	495,633	-	**435,973**	-	-	-	-	-	-	-	-
2026	502,755	-	**435,973**	-	-	-	-	-	-	-	-
2027	510,006	-	**435,973**	-	-	-	-	-	-	-	-
2028	517,169	-	**435,973**	-	-	-	-	-	-	-	-
2029	524,480	-	**435,973**	-	-	-	-	-	-	-	-
2030	531,858	-	**435,973**	-	-	-	-	-	-	-	-
2031 (Yr1)	539,903	-	**435,973**	550,701	620,889	587,145	638,945	550,701	620,889	**587,145**	**151,172**
2032	548,122	-	**435,973**	559,084	630,340	596,082	638,945	559,084	630,340	**596,082**	**160,109**
2033	556,526	-	**435,973**	567,657	640,005	605,222	638,945	567,657	638,945	**605,222**	**169,249**
2034	565,177	-	**435,973**	576,480	649,953	614,630	638,945	576,480	638,945	**614,630**	**178,657**
2035	574,015	-	**435,973**	585,495	660,117	624,241	638,945	585,495	638,945	**624,241**	**188,268**
2036	583,186	-	**435,973**	594,850	670,664	634,215	638,945	594,850	638,945	**634,215**	**198,242**
2037	592,572	-	**435,973**	604,424	681,458	644,422	638,945	604,424	638,945	**638,945**	**202,972**
2038	602,074	-	**435,973**	614,115	692,385	654,755	638,945	614,115	638,945	**638,945**	**202,972**
2039	611,791	-	**435,973**	624,027	703,560	665,323	638,945	624,027	638,945	**638,945**	**202,972**

2040	621,873	-	**435,973**	634,311	715,154	676,287	638,945	634,311	638,945	**638,945**	**202,972**
2041	-	631,914	**435,973**	644,552	726,701	687,206	638,945	638,945	638,945	**638,945**	**202,972**
2042	-	642,116	**435,973**	654,958	738,433	698,301	638,945	638,945	638,945	**638,945**	**202,972**
2043	-	652,483	**435,973**	665,533	750,356	709,575	638,945	638,945	638,945	**638,945**	**202,972**
2044	-	663,018	**435,973**	676,278	762,470	721,032	638,945	638,945	638,945	**638,945**	**202,972**
2045	-	673,722	**435,973**	687,197	774,781	732,673	638,945	638,945	638,945	**638,945**	**202,972**
2046	-	684,600	**435,973**	698,292	787,290	744,502	638,945	638,945	638,945	**638,945**	**202,972**
2047	-	695,653	**435,973**	709,566	800,001	756,522	638,945	638,945	638,945	**638,945**	**202,972**
2048	-	706,884	**435,973**	721,022	812,917	768,737	638,945	638,945	638,945	**638,945**	**202,972**
2049	-	718,297	**435,973**	732,663	826,042	781,148	638,945	638,945	638,945	**638,945**	**202,972**
2050	-	729,894	**435,973**	744,492	839,378	793,760	638,945	638,945	638,945	**638,945**	**202,972**
2051	-	741,679	**435,973**	756,512	852,930	806,575	638,945	638,945	638,945	**638,945**	**202,972**
2052	-	753,653	**435,973**	768,726	866,701	819,598	638,945	638,945	638,945	**638,945**	**202,972**
2053	-	765,821	**435,973**	781,137	880,694	832,830	638,945	638,945	638,945	**638,945**	**202,972**
2054	-	778,185	**435,973**	793,749	894,913	846,277	638,945	638,945	638,945	**638,945**	**202,972**
2055	-	790,749	**435,973**	806,564	909,362	859,940	638,945	638,945	638,945	**638,945**	**202,972**

2056	-	803,516	**435,973**	819,587	924,044	873,824	638,945	638,945	638,945	**638,945**	**202,972**
2057	-	816,489	**435,973**	832,819	938,963	887,932	638,945	638,945	638,945	**638,945**	**202,972**
2058	-	829,672	**435,973**	846,265	954,122	902,268	638,945	638,945	638,945	**638,945**	**202,972**
2059	-	843,067	**435,973**	859,928	969,527	916,835	638,945	638,945	638,945	**638,945**	**202,972**
2060	-	856,679	**435,973**	873,812	985,180	931,638	638,945	638,945	638,945	**638,945**	**202,972**
2061	-	870,510	**435,973**	887,920	1,001,086	946,679	638,945	638,945	638,945	**638,945**	**202,972**
2062	-	884,564	**435,973**	902,256	1,017,249	961,964	638,945	638,945	638,945	**638,945**	**202,972**
2063	-	898,846	**435,973**	916,823	1,033,673	977,495	638,945	638,945	638,945	**638,945**	**202,972**
2064	-	913,358	**435,973**	931,625	1,050,362	993,277	638,945	638,945	638,945	**638,945**	**202,972**
2065	-	928,104	**435,973**	946,667	1,067,320	1,009,314	638,945	638,945	638,945	**638,945**	**202,972**
2066	-	943,089	**435,973**	961,951	1,084,552	1,025,609	638,945	638,945	638,945	**638,945**	**202,972**
2067	-	958,315	**435,973**	977,482	1,102,063	1,042,168	638,945	638,945	638,945	**638,945**	**202,972**
2068	-	973,788	**435,973**	993,263	1,119,856	1,058,994	638,945	638,945	638,945	**638,945**	**202,972**
2069	-	989,510	**435,973**	1,009,300	1,137,936	1,076,092	638,945	638,945	638,945	**638,945**	**202,972**
2070	-	1,005,486	**435,973**	1,025,595	1,156,308	1,093,466	638,945	638,945	638,945	**638,945**	**202,972**
2071	-	1,021,719	**435,973**	1,042,154	1,174,977	1,111,120	638,945	638,945	638,945	**638,945**	**202,972**

2072	-	1,038,215	**435,973**	1,058,980	1,193,948	1,129,059	638,945	638,945	638,945	**638,945**	**202,972**
2073	-	1,054,978	**435,973**	1,076,077	1,213,224	1,147,288	638,945	638,945	638,945	**638,945**	**202,972**
2074	-	1,072,011	**435,973**	1,093,451	1,232,812	1,165,811	638,945	638,945	638,945	**638,945**	**202,972**
2075	-	1,089,318	**435,973**	1,111,105	1,252,716	1,184,634	638,945	638,945	638,945	**638,945**	**202,972**
2076	-	1,106,906	**435,973**	1,129,044	1,272,942	1,203,760	638,945	638,945	638,945	**638,945**	**202,972**
2077	-	1,124,727	**435,973**	1,147,222	1,293,436	1,223,141	638,945	638,945	638,945	**638,945**	**202,972**
2078	-	1,142,835	**435,973**	1,165,692	1,314,261	1,242,833	638,945	638,945	638,945	**638,945**	**202,972**
2079	-	1,161,235	**435,973**	1,184,460	1,335,420	1,262,843	638,945	638,945	638,945	**638,945**	**202,972**
2080 (YrF)	-	1,179,931	**435,973**	1,203,529	1,356,921	1,283,174	638,945	638,945	638,945	**638,945**	**202,972**

Source: WSP

BAY AREA TRANSIT SYSTEM RIDERSHIP INCREASES FROM CORE CAPACITY PROGRAM

INTRODUCTION

As noted previously, this 2020 TIRCP ridership and GHG analyses include ridership changes on other transit services in the Bay Area that result from implementation of the Core Capacity Program. These Bay Area Transit System ridership increases are a result of improved BART Transbay services. This modeling was projected based on the Metropolitan Transportation Commission's (MTC's) Travel Model One forecast.

BAY AREA RIDERSHIP METHODOLOGY

Travel Model One is an Activity-Based Model (ABM) covering the nine-county San Francisco Bay Area, which is used to simulate travelers' reaction to transportation projects and policies in the region, as well as to quantify the impact of cumulative individual decisions on the Bay Area's transportation networks. The model system operates on a synthetic population that includes households and people representing each actual household and person in the nine-county Bay Area – in both historical and prospective years. The model system simulates a series of travel-related choices for each household and for each person within each household. Travelers move through a space segmented into "travel analysis zones" and, in so doing, use the transportation system. To assign the simulated travel demand to the transportation system, the 24 hours of the day are grouped into the following five time periods:

- Early AM, 3 am to 6 am;
- AM peak (also referred to as the "morning commute"), 6 am to 10 am;
- Midday, 10 am to 3 pm;
- PM peak (also referred to as the "evening commute"), 3 pm to 7 pm; and,
- Evening, 7 pm to 3 am.

The travel model is used to simulate a typical weekday – when school is in session, the weather is pleasant, and no major accidents or incidents disrupt the transportation system.

Travel models are updated frequently. The current application uses MTC's Travel Model One (version 0.6), released in July 2016, calibrated to year 2000 conditions and validated against year 2000, 2005, 2010 and 2015 conditions. Travel Model One is run for two scenarios – 2020 No-Build and 2020 Build. In the No-Build scenario, the model is run as it is. In the Build Scenario, it is assumed with the Transbay Core Capacity Program is in effect. The BART lines that use the Transbay Tube will run at increased frequency during AM peak and PM peak periods. For BART Red Line, Yellow Line, Green Line, and Blue Line, the peak headways were reduced from 15 minutes to 12 minutes. This results in increased BART Transbay ridership and changes in ridership in the rest of the Bay Area transit systems. Transit lines are grouped by operators and transit modes to calculate changes in ridership per BART ridership increase.

The ridership change rates are then applied to BART ridership increase forecast that is described in Section 1 of this document, for the future years from 2031 - 2080 to derive future ridership change in other Bay Area transit systems.

BAY AREA TRANSIT SERVICES RIDERSHIP MODELING RESULTS

The results of the analysis described above are shown below. From implementation of the Core Capacity Program (306 vehicles and implementation of the CBTC system) on the BART system, all Bay Area Transit Services will have an increased ridership of 49,012 in 2031 and 65,806 in 2080. This ridership increase on other transit systems is attributed to the increased frequencies and capacity that the 306 Vehicles and CBTC System will bring to the BART System.

		Operator	MUNI		AC Transit		Caltrain		Golden Gate Transit		SamTrans		VTA			Minor					
		Mode / Category	Light Rail	Local Bus	Express Bus	Local Bus	Commuter Rail	Local Bus	Express Bus	Ferry	Express Bus	Local Bus	Light Rail	Express Bus	Local Bus	Commuter Rail	Heavy Rail	Express Bus	Local Bus	Ferry	TOTAL RIDERSHIP CHANGE
Year	BART Ridership Increase	Rideship Change Rate (per BART Trip)	-0.03	-0.04	-0.09	0.18	-0.04	0.03	0.02	-0.01	-0.01	0.08	0.04	0.00	0.12	0.00	0.00	0.04	0.18	-0.15	
2031	151,172		-3,848	-6,657	-13,138	27,580	-5,684	3,804	2,477	-2,234	-1,968	11,744	6,480	-265	18,756	686	-66	6,702	26,651	-22,007	**49,012**
2032	160,109		-4,076	-7,051	-13,914	29,211	-6,020	4,029	2,624	-2,366	-2,085	12,439	6,863	-281	19,864	726	-70	7,098	28,227	-23,308	**51,910**
2033	169,249		-4,309	-7,453	-14,709	30,878	-6,364	4,259	2,773	-2,501	-2,204	13,149	7,255	-297	20,998	768	-74	7,503	29,838	-24,638	**54,873**
2034	178,657		-4,548	-7,868	-15,526	32,595	-6,718	4,496	2,928	-2,640	-2,326	13,880	7,659	-314	22,165	810	-78	7,920	31,497	-26,008	**57,923**
2035	188,268		-4,793	-8,291	-16,362	34,348	-7,079	4,738	3,085	-2,782	-2,451	14,626	8,071	-331	23,358	854	-83	8,346	33,191	-27,407	**61,039**
2036	198,242		-5,047	-8,730	-17,228	36,168	-7,454	4,989	3,248	-2,929	-2,581	15,401	8,498	-348	24,595	899	-87	8,788	34,950	-28,859	**64,273**
2037	202,972		-5,167	-8,938	-17,639	37,031	-7,632	5,108	3,326	-2,999	-2,643	15,769	8,701	-356	25,182	921	-89	8,998	35,784	-29,547	**65,806**
2038	202,972		-5,167	-8,938	-17,639	37,031	-7,632	5,108	3,326	-2,999	-2,643	15,769	8,701	-356	25,182	921	-89	8,998	35,784	-29,547	**65,806**
2039	202,972		-5,167	-8,938	-17,639	37,031	-7,632	5,108	3,326	-2,999	-2,643	15,769	8,701	-356	25,182	921	-89	8,998	35,784	-29,547	**65,806**
2040	202,972		-5,167	-8,938	-17,639	37,031	-7,632	5,108	3,326	-2,999	-2,643	15,769	8,701	-356	25,182	921	-89	8,998	35,784	-29,547	**65,806**
2041	202,972		-5,167	-8,938	-17,639	37,031	-7,632	5,108	3,326	-2,999	-2,643	15,769	8,701	-356	25,182	921	-89	8,998	35,784	-29,547	**65,806**
2042	202,972		-5,167	-8,938	-17,639	37,031	-7,632	5,108	3,326	-2,999	-2,643	15,769	8,701	-356	25,182	921	-89	8,998	35,784	-29,547	**65,806**
2043	202,972		-5,167	-8,938	-17,639	37,031	-7,632	5,108	3,326	-2,999	-2,643	15,769	8,701	-356	25,182	921	-89	8,998	35,784	-29,547	**65,806**

2044	202,972		-5,167	-8,938	-17,639	37,031	-7,632	5,108	3,326	-2,999	-2,643	15,769	8,701	-356	25,182	921	-89	8,998	35,784	-29,547	**65,806**
2045	202,972		-5,167	-8,938	-17,639	37,031	-7,632	5,108	3,326	-2,999	-2,643	15,769	8,701	-356	25,182	921	-89	8,998	35,784	-29,547	**65,806**
2046	202,972		-5,167	-8,938	-17,639	37,031	-7,632	5,108	3,326	-2,999	-2,643	15,769	8,701	-356	25,182	921	-89	8,998	35,784	-29,547	**65,806**
2047	202,972		-5,167	-8,938	-17,639	37,031	-7,632	5,108	3,326	-2,999	-2,643	15,769	8,701	-356	25,182	921	-89	8,998	35,784	-29,547	**65,806**
2048	202,972		-5,167	-8,938	-17,639	37,031	-7,632	5,108	3,326	-2,999	-2,643	15,769	8,701	-356	25,182	921	-89	8,998	35,784	-29,547	**65,806**
2049	202,972		-5,167	-8,938	-17,639	37,031	-7,632	5,108	3,326	-2,999	-2,643	15,769	8,701	-356	25,182	921	-89	8,998	35,784	-29,547	**65,806**
2050	202,972		-5,167	-8,938	-17,639	37,031	-7,632	5,108	3,326	-2,999	-2,643	15,769	8,701	-356	25,182	921	-89	8,998	35,784	-29,547	**65,806**
2051	202,972		-5,167	-8,938	-17,639	37,031	-7,632	5,108	3,326	-2,999	-2,643	15,769	8,701	-356	25,182	921	-89	8,998	35,784	-29,547	**65,806**
2052	202,972		-5,167	-8,938	-17,639	37,031	-7,632	5,108	3,326	-2,999	-2,643	15,769	8,701	-356	25,182	921	-89	8,998	35,784	-29,547	**65,806**
2053	202,972		-5,167	-8,938	-17,639	37,031	-7,632	5,108	3,326	-2,999	-2,643	15,769	8,701	-356	25,182	921	-89	8,998	35,784	-29,547	**65,806**
2054	202,972		-5,167	-8,938	-17,639	37,031	-7,632	5,108	3,326	-2,999	-2,643	15,769	8,701	-356	25,182	921	-89	8,998	35,784	-29,547	**65,806**
2055	202,972		-5,167	-8,938	-17,639	37,031	-7,632	5,108	3,326	-2,999	-2,643	15,769	8,701	-356	25,182	921	-89	8,998	35,784	-29,547	**65,806**
2056	202,972		-5,167	-8,938	-17,639	37,031	-7,632	5,108	3,326	-2,999	-2,643	15,769	8,701	-356	25,182	921	-89	8,998	35,784	-29,547	**65,806**
2057	202,972		-5,167	-8,938	-17,639	37,031	-7,632	5,108	3,326	-2,999	-2,643	15,769	8,701	-356	25,182	921	-89	8,998	35,784	-29,547	**65,806**
2058	202,972		-5,167	-8,938	-17,639	37,031	-7,632	5,108	3,326	-2,999	-2,643	15,769	8,701	-356	25,182	921	-89	8,998	35,784	-29,547	**65,806**
2059	202,972		-5,167	-8,938	-17,639	37,031	-7,632	5,108	3,326	-2,999	-2,643	15,769	8,701	-356	25,182	921	-89	8,998	35,784	-29,547	**65,806**
2060	202,972		-5,167	-8,938	-17,639	37,031	-7,632	5,108	3,326	-2,999	-2,643	15,769	8,701	-356	25,182	921	-89	8,998	35,784	-29,547	**65,806**
2061	202,972		-5,167	-8,938	-17,639	37,031	-7,632	5,108	3,326	-2,999	-2,643	15,769	8,701	-356	25,182	921	-89	8,998	35,784	-29,547	**65,806**
2062	202,972		-5,167	-8,938	-17,639	37,031	-7,632	5,108	3,326	-2,999	-2,643	15,769	8,701	-356	25,182	921	-89	8,998	35,784	-29,547	**65,806**
2063	202,972		-5,167	-8,938	-17,639	37,031	-7,632	5,108	3,326	-2,999	-2,643	15,769	8,701	-356	25,182	921	-89	8,998	35,784	-29,547	**65,806**
2064	202,972		-5,167	-8,938	-17,639	37,031	-7,632	5,108	3,326	-2,999	-2,643	15,769	8,701	-356	25,182	921	-89	8,998	35,784	-29,547	**65,806**
2065	202,972		-5,167	-8,938	-17,639	37,031	-7,632	5,108	3,326	-2,999	-2,643	15,769	8,701	-356	25,182	921	-89	8,998	35,784	-29,547	**65,806**
2066	202,972		-5,167	-8,938	-17,639	37,031	-7,632	5,108	3,326	-2,999	-2,643	15,769	8,701	-356	25,182	921	-89	8,998	35,784	-29,547	**65,806**
2067	202,972		-5,167	-8,938	-17,639	37,031	-7,632	5,108	3,326	-2,999	-2,643	15,769	8,701	-356	25,182	921	-89	8,998	35,784	-29,547	**65,806**
2068	202,972		-5,167	-8,938	-17,639	37,031	-7,632	5,108	3,326	-2,999	-2,643	15,769	8,701	-356	25,182	921	-89	8,998	35,784	-29,547	**65,806**
2069	202,972		-5,167	-8,938	-17,639	37,031	-7,632	5,108	3,326	-2,999	-2,643	15,769	8,701	-356	25,182	921	-89	8,998	35,784	-29,547	**65,806**
2070	202,972		-5,167	-8,938	-17,639	37,031	-7,632	5,108	3,326	-2,999	-2,643	15,769	8,701	-356	25,182	921	-89	8,998	35,784	-29,547	**65,806**
2071	202,972		-5,167	-8,938	-17,639	37,031	-7,632	5,108	3,326	-2,999	-2,643	15,769	8,701	-356	25,182	921	-89	8,998	35,784	-29,547	**65,806**
2072	202,972		-5,167	-8,938	-17,639	37,031	-7,632	5,108	3,326	-2,999	-2,643	15,769	8,701	-356	25,182	921	-89	8,998	35,784	-29,547	**65,806**
2073	202,972		-5,167	-8,938	-17,639	37,031	-7,632	5,108	3,326	-2,999	-2,643	15,769	8,701	-356	25,182	921	-89	8,998	35,784	-29,547	**65,806**

2074	202,972		-5,167	-8,938	-17,639	37,031	-7,632	5,108	3,326	-2,999	-2,643	15,769	8,701	-356	25,182	921	-89	8,998	35,784	-29,547	**65,806**
2075	202,972		-5,167	-8,938	-17,639	37,031	-7,632	5,108	3,326	-2,999	-2,643	15,769	8,701	-356	25,182	921	-89	8,998	35,784	-29,547	**65,806**
2076	202,972		-5,167	-8,938	-17,639	37,031	-7,632	5,108	3,326	-2,999	-2,643	15,769	8,701	-356	25,182	921	-89	8,998	35,784	-29,547	**65,806**
2077	202,972		-5,167	-8,938	-17,639	37,031	-7,632	5,108	3,326	-2,999	-2,643	15,769	8,701	-356	25,182	921	-89	8,998	35,784	-29,547	**65,806**
2078	202,972		-5,167	-8,938	-17,639	37,031	-7,632	5,108	3,326	-2,999	-2,643	15,769	8,701	-356	25,182	921	-89	8,998	35,784	-29,547	**65,806**
2079	202,972		-5,167	-8,938	-17,639	37,031	-7,632	5,108	3,326	-2,999	-2,643	15,769	8,701	-356	25,182	921	-89	8,998	35,784	-29,547	**65,806**
2080	202,972		-5,167	-8,938	-17,639	37,031	-7,632	5,108	3,326	-2,999	-2,643	15,769	8,701	-356	25,182	921	-89	8,998	35,784	-29,547	**65,806**

RIDERSHIP RESULTS

By combining the BART ridership increases and the other Bay Area transit services ridership increases detailed in this methodology, the inputs for the GHG Analysis were developed.

TABLE 4. TOTAL DAILY AND ANNUNAL RIDERSHIP INCREASE AS PART OF CORE CAPACITY PROJECT

	BART DAILY RIDERSHIP INCREASE	BAY AREA TRANSIT SERVICES DAILY RIDERSHIP INCREASE	TOTAL DAILY RIDERSHIP INCREASE DUE TO PROJECT	ANNUALIZATION FACTOR*	TOTAL ANNUAL RIDERSHIP INCREASE DUE TO PROJECT
Year 1 – 2031	151,172	49,012	200,184	291.5	58,353,642
Year Final - 2080	202,972	65,806	268,778	291.5	78,348,870

*See Greenhouse Gas Memo for more details on Annualization Factor

Appendix D. Outreach to Disadvantaged and Low Income Communities

Fleet of the Future Final Train Car Model

Project Overview
BART is in the process of replacing its original fleet of rail cars. The new Fleet of the Future will replace all 669 cars in the current fleet and add additional cars to alleviate crowding during peak periods and make more seats available to riders. BART's has already ordered 775 train cars and has plans to grow the fleet to 1,081 cars.

Public Participation Activities
In April and May 2014, BART presented a full-scale model of its proposed new train car design to the public through a series of ten events throughout the Bay Area. BART invited the public to tour the new car and provide feedback by completing a survey form.

BART conducted outreach for the public events using the following methods:

- Creation of an outreach flyer with instructions in four languages on how to request translation services
- BART website announcement and news story
- Multiple BART news alerts to project subscriber list
- Advertisements in local print media including Oakland Post, El Mensajero (Spanish), El Mundo (Spanish), Sing Tao (Chinese), World Journal (Chinese), Korean Times (Korean), Kyocharo Korean News (Korean), and Viet Nam, The Daily News (Vietnamese)
- Announcement on the BART Destination Sign System (DSS) at all BART stations
- Noticing at BART stations through event banners and signage
- BART social media posts
- Email distribution to over 400 CBOs and elected officials in Alameda, Contra Costa, and San Francisco County
- Email and presentations to BART Advisory Committees and Task Force Members
- Two videos posted to BART TV (Youtube)
- Outreach "street teams" located at the station during event hours

Event Locations	Date and Time	Surveys
Justin Herman Plaza (near Embarcadero Station)	Wednesday, April 16, 2014 11:30 am – 7:00 pm	1,254
West Oakland BART Station	Friday, April 18, 2014 2:00 – 7:00 pm	632
Fremont BART Station	Monday, April 21, 2014 2:00 – 7:00 pm	933
Pittsburg/Bay Point BART Station	Wednesday, April 23, 2014 2:00 – 7:00 pm	702
San Francisco Civic Center Plaza (Near Civic Center Station)	Friday, April 25, 2014 11:00 am – 7:00 pm	927

Event Locations	Date and Time	Surveys
North Berkeley BART Station	Tuesday, April 29, 2014 2:00 – 7:00 pm	914
Milpitas/San Jose – Great Mall Main Transit Center	Friday, May 2, 2014 2:00 – 7:00 pm	209
Dublin/Pleasanton BART Station	Monday, May 5, 2014 2:00 – 7:00 pm	591
Fruitvale BART Station	Wednesday, May 7, 2014 2:00 – 7:00 pm	709
Concord BART Station	Friday, May 9 2014 2:00 – 7:00 pm	795
	Total Surveys	7,666

Translated copies of the informational displays and surveys were available in Chinese, Korean, Spanish, and Vietnamese. Spanish translation services were provided for the event at Fruitvale Station.

In all, approximately 17,500 people attended the events and a total of 7,666 surveys were collected. Over 5,000 people also wrote comments on their survey forms. Of the total of 7,666 survey forms completed, 111 were completed in Spanish and 9 were completed in Chinese. No surveys were completed in Vietnamese or Korean.

BART Vision – Future BART

Project Overview

BART Vision - Future BART is an effort to begin mapping out the future of the BART system. BART is now 44 years old, and requires significant system reinvestment to continue to provide high quality service. In addition, the region will change and grow significantly over the next 40 years. This planning effort explored the tradeoffs involved in considering how BART can meet these dual challenges. The BART Vision Plan is about narrowing down the options of projects BART should focus on by determining which ones are most important to the public and fit best into our goals of serving the Bay Area for years to come.

Public Participation Activities

The public was invited to a series of in station events to play an interactive planning and budgetary game on an Ipad tablet. The game outlined three improvement categories participants could select from: Fix and Modernize BART; More Train and Station Capacity; and New Lines & Extensions. Within the three categories participants could choose and prioritize specific projects and the revenue sources to help pay for them. Revenue sources included a bond measure, regional gas tax, higher bridge tolls, and others. The "player" was given a budget and needed to stick to it or select additional funding sources if they wanted to select more projects. The purpose of the exercise was to show participants, in real time, the potential benefits and impacts of different spending decisions and the annual household cost of your selected priorities. Large poster boards were also displayed at each in station event to educate the public on the BART Vision planning process and three improvement categories. Spanish Interpreters also were provided at the Pittsburg/Bay Point Station and Chinese interpreters were provided at Balboa Park and Montgomery Street Stations.

For members of the public not able to attend a station event, the game was available online at www.futurebart.org. During in-station events, BART staff also passed out postcard sized versions of the flyer with the website for the online game.

A total of ten in-station events were held on the following dates between 4 – 7pm.

- Fremont Station - Tuesday, Oct 7, 2014
- Balboa Park Station - Wednesday, Oct 8, 2014
- El Cerrito del Norte Station - Thursday, Oct 9, 2014
- Pittsburg/Bay Point Station – Tuesday, Oct 14, 2014
- Dublin/Pleasanton Station – Wednesday, Oct 15, 2014
- Walnut Creek Station – Thursday, Oct 16, 2014
- 19th Street /Oakland Station – Tuesday, Oct 21, 2014
- Downtown Berkeley Station – Wednesday, Oct 22, 2014
- Richmond Station – Tuesday Oct 28, 2014
- Montgomery Street Station – Thursday, Oct 30, 2014

BART conducted public outreach for the in-station events using the following methods:

- Creation of a meeting notice translated into Chinese and Spanish with translation taglines in Tagalog, Vietnamese, and Korean
- Email notification with flyer to over 480 CBOs and Elected Official database
- BART website announcement and news story
- Email and presentation to BART Advisory Committees and Task Force Members

- Announcement on the BART Destination Sign System (DSS)
- Social media announcements
- In-station signage
- Postcard size flyer with survey link

Over 2,551 survey responses to the game were received by project staff. The feedback received will be used to develop the BART Vision Plan which will help guide the BART Board of Directors and staff when making decisions about the future of BART.

Embarcadero & Montgomery Capacity Implementation Plan and Modernization Study

Project Overview

BART is working to improve the capacity at two of our busiest stations – Embarcadero and Montgomery. While ridership has been growing for several years, BART has performed several studies to develop project concepts to handle the increasing demand. In addition, BART is identifying modernization needs to improve station functionality, safety, access, appearance, and the overall customer experience. Understanding the concerns of stakeholders and BART riders has been central to the planning underway. BART is now developing an implementation and phasing plan to move forward with the most effective near-term improvements as well as potential future projects to accommodate the increasing number of riders and modernize the stations. These efforts are vital to support the continuing growth of the region and its transit network.

Public Participation Activities

BART held a series of in-station open houses to solicit public input. The first open house events were held on October 28, 2014, at Embarcadero Station during the AM and PM commute hours and October 30, 2014, at Montgomery Station also during the AM and PM commute hours. The purpose of the outreach was to inform BART riders and the public about BART's planning process and efforts to implement capacity and modernization efforts at the stations; build awareness and understanding of challenges and potential solutions; identify community issues beyond those that have already been raised or anticipated; and survey riders and the public on preferences for modernization/capacity improvements.

During the four events, BART staff handed out more than 15,000 postcards with project information in three languages (English, Spanish, Chinese) and taglines in Tagalog, Korean and Vietnamese. The postcard included a link to the project webpage and a request to fill out a survey for each station. Hardcopy surveys and drop boxes for surveys were available at each station for at least 24 hours before and after the events. There were large display boards that included information about the overall project and concepts for increasing capacity and modernization improvements at these stations. The display boards and surveys were also available in Spanish and Chinese.

For Embarcadero Station 2,858 survey responses were received and for Montgomery Station 2,042, totaling 4,900 survey responses. In total, eight Chinese language surveys were collected and seven Spanish language surveys.

A second round of in-station open houses at Embarcadero and Montgomery BART stations was held in October 2015. These events focused on the recommended alternative concepts and modernization improvement options. The open houses were held at the Embarcadero Station on October 13, 2015, and at the Montgomery Station on October 14, 2015. Both were held during the morning commute from 7-10 AM in the free areas of the stations. The public had an opportunity to view display boards, laptops depicting pedestrian flow modeling and 3-D illustrations of the recommended concepts, recommended alternative concepts, and modernization options for each station. The display information was also available in Spanish and Chinese. Comments were collected in conversations (on clip boards) and on an unmonitored, large-format easel note pads that allowed anyone to comment on their own.

BART conducted public outreach for the in-station events using the following methods:

- Creation of outreach flyer with instructions in four languages (Chinese, Korean, Spanish and Vietnamese) on how to request translation services
- Email flyer and survey to key stakeholder mailing list including neighborhood organizations, business groups, community based organizations, elected officials, schools, media and members of the Technical Advisory Committee
- Announcements through BART's Destination Sign System
- BART news story and email alert
- Social Media announcements
- Email and presentation to BART Advisory Committees and Task Force Members
- In-station signage (large posters, digital signs, and sandwich boards)
- Postcard size flyer with survey link

Better BART

Project Overview

The Better BART outreach program is an initiative to educate the Bay Area public about BART's 45 year old system and the critical infrastructure investments that it needs. Despite BART's aging infrastructure, the Bay Area economy is relying on BART more than ever as BART experiences record ridership and increased capacity. BART estimates that it requires a 9 billion dollar investment to improve three key components of its infrastructure; 1. The purchase of new rail cars, 2. Modernization of the operation control center and, 3. Expansion of the Hayward Maintenance Facility. BART has identified federal, state and local funding to pay for half of the investments that are needed to upgrade the system.

The goal of the program is to increase public awareness and build a broad coalition of supporters ready to champion public re-investment in the BART system. The coalition included elected officials, businesses, labor, environmental organizations, bicycle advocates, senior and disability advocacy groups, first responders and community based organizations.

Public Participation Activities

In November 2016, Bay Area voters passed Measure RR, a $3.5 billion infrastructure bond to reinvest in BART. As of November 2017, BART has given over 400 presentations to diverse stakeholder groups in the Bay Area to educate the public about its infrastructure needs and to update the public about the bond construction that is taking place. BART has distributed survey questionnaires to all presentation attendees and received over 1500 responses to date.

MTC Plan Bay Area 2040

Project Overview

MTC's Plan Bay Area 2040 is long-range transportation and land use plan mandated by SB375. The region adopted its first regional transportation plan in 2013, which focused on the reduction of greenhouse gas emissions through the promotion of more compact, mixed use residential and commercial development near public transportation. Plan Bay Area 2040 builds upon the goals established in Plan Bay Area and considers how growth will occur throughout the region over the next twenty-four years. BART is as a key stakeholder in Plan Bay Area 2040 participated throughout the multiyear outreach activities led by MTC.

Public Participation Activities

Public participation activities included extensive outreach with local government officials, community based organizations, agency stakeholders, the region's 101 cities and nine counties also participated in the development of the Plan.

Engagement activities include workshops in each county and public hearings on the draft prior to adoption of a final plan. Thousands of people have participated in public open houses and other public meetings, telephone and internet surveys, and more.

Highlights from the effort include:

- 27 open houses in the nine Bay Area counties that drew nearly 1,500 participants over the three rounds of open houses (three open houses per county)
- One statistically valid telephone poll in spring of 2016 that reached out to more than 2,000 Bay Area residents from all nine counties and conducted in English, Spanish and Chinese
- Six public hearings to gather input on the plan's environmental impact report (EIR)
- A regional housing summit attended by some 300 Bay Area public officials, community leaders and interested residents to consider ideas and best practices for alleviating the region's housing affordability crisis
- Ongoing meetings with local elected officials, local planning directors and officials from congestion management and transit agencies as well as staff from environmental protection agencies, including 10 presentations to elected officials on the Draft Plan
- Partnerships with community-based organizations (CBOs) in low-income communities and communities of color that featured presentations by CBO leaders directly to MTC and ABAG decision makers, 168 completed online surveys ranking planning scenarios and five focus groups with 70 residents to discuss the Draft Plan
- An active web presence, including nearly 255,000 page views by 63,000 unique visitors to the PlanBayArea.org and 2040.planbayarea.org websites between July 2014 and July 2017 (60 percent of visitors were new visitors)
- An active social media presence with a total of 28 paid campaigns on Facebook and Twitter
- Online "Build a Better Bay Area" survey taken by some 920 participants helped illustrate policy and fiscal tradeoffs associated with three different future growth and transportation scenarios
- Nine videos produced, posted online explain the planning process and challenge facing the region
- The Plan was discussed at a total of 195 public meetings during its development.

MTC documented its public participation below are highlights from the transportation related feedback collected throughout public participation activities:

- For transportation, people would like to see more transit alternatives (especially BART), as well as extended hours of transit service. They prioritized efforts to ensure reliability and connectivity of the transportation network as well as the infrastructure needed to support bicycling and walking.
- There was strong support for increased BART extensions and increased BART service

MTC Core Capacity Transit Study

Project Overview

MTC's Core Capacity Transit Study is a collaborative effort to improve public transportation to and from the San Francisco core. Five transit operators: BART, Muni, AC Transit, Caltrain, and the Water Emergency Transportation Authority, in coordination with the San Francisco County Transportation Authority (SFCTA) and the Metropolitan Transportation Commission (MTC) have committed to identifying investments and improvements to increase transit capacity to the San Francisco Core. BART's investments include, expansion of its railcar fleet to increase train car length and increased headways, additional storage and maintenance capacity, a new train control system and upgrades to BART's traction power system.

Public Participation Activities

In February 2017, the MTC's Core Capacity Transit Study Project Management Team hosted two public workshops to discuss the study's evaluation criteria and project packages with project stakeholders. The workshops were held at the SPUR offices in San Francisco and Oakland, and between 30 and 50 people attended each event. The purpose of the public meetings was to provide participants an overview of the study background and obtain feedback on short, medium and long-term transit enhancement concepts. Breakout groups allowed participants to share their thoughts on, concerns with, and suggestions for the various evaluation criteria and project packages.

Hayward Maintenance Complex Phase II Noise Study

Project Overview

The HMC project is identified BART's Strategic Maintenance Plan, adopted in 2008, as a priority measure to achieve its goal to expand BART's maintenance and operations capacity in order to accommodate future riders from BART expansions, including to San Jose, East Contra Costa County, Oakland Airport Connector and Livermore. HMC is critical to improving BART's long-term car reliability and passenger service on the BART system.

Public Participation Activities

On October 21, 2010, BART hosted a public meeting to discuss and solicit input from community members regarding the proposed Hayward Maintenance Complex (HMC) project. Community meeting participants had the opportunity to ask questions and provide feedback. During the meeting, participants were asked to sign in and were provided a project brief and other BART informational materials. BART staff briefly reviewed the agenda and meeting purpose, followed by a presentation about the HMC project, which described the project purpose, need, elements, and the environmental analysis and review timeline. Following the presentation meeting attendees participated in discussion and had the opportunity to ask questions and make multiple comments. A graphic recorder took notes and recorded comments and questions on large scale wallgraphic paper.

BART conducted additional outreach for the meetings using the following methods:

- Mailings to residents (4,600) and businesses (600) within one mile of the HMC site
- BART website announcement
- Bay Area Media, both print and online
- "In person" outreach in nearby communities
- Creation of trilingual flyer and mailer in English, Spanish and Tagalog
- Distribution of postcards, flyers and community bulletins through the following local community-based and municipal organizations:

EXECUTIVE DECISION DOCUMENT

GENERAL MANAGER APPROVAL: 30 NOV 2017		GENERAL MANAGER ACTION REQ'D: No		
DATE: 11/21/2017		BOARD INITIATED ITEM: No		
Originator/Prepared by: Holly Gordon Dept: Systems Development Signature/Date: 11/29/17	General Counsel 11/29/17 [ ]	Controller/Treasurer 11/30/17 [ ]	District Secretary [ ]	BARC 11.29.17 [ ]

Status: Approved	Date Created: 11/21/2017

Approval of Power Purchase Agreements for Wholesale Renewable Energy

PURPOSE:

To obtain Board authorization to enter into two 20-year Power Purchase Agreements ("PPAs") for wholesale renewable energy. The first agreement is with NextEra Energy for energy generated from a new 61.7 MW wind project to be located in Kern County, California. The second agreement is with Recurrent Energy for energy generated from a new 45 MW solar project also to be located in Kern County, California.

DISCUSSION:

In 2015, the California legislature passed Senate Bill 502 (authored by Senator Leno), which allows BART to directly procure eligible renewable energy resources. In late April 2017, the Board approved the Wholesale Electricity Portfolio Policy ("WEPP"), which sets performance measures for procuring BART's power from eligible renewable energy resources. To begin implementing the WEPP, BART staff released a Request for Proposals ("RFP") titled "BART 2017 Renewable Energy RFP" on May 8, 2017. In choosing projects, the objectives of the RFP were as follows:

- Align procurement with Board Policy.
- Purchase long-term (10-30 year) renewable supply at stable, competitive prices.
- Ensure developers are experienced and creditworthy, and contracts mitigate BART's exposure to market, development and production risks.
- Ensure projects are realistic and far along in preconstruction planning.
- Ensure BART's risks during delivery terms are minimized.

On August 11, 2017, BART staff selected the NextEra wind project and the Recurrent solar project. PPAs for these projects were finalized in late November 2017. The key provisions of the PPAs are as follows:

Developer	NextEra Energy	Recurrent Energy
Project Name	Sky River	Gaskell West 2
Technology	Wind Energy	Solar energy
Location	Kern County (east of Bakersfield)	Kern County (southeast of Bakersfield)
Delivery Term	1/1/2021 - 12/31/2040	1/1/2021 - 12/31/2040
Project Size	61.7 MW	45 MW
Expected Output	257,000 MWh/Year	130,000 MWh/Year

The projects will meet approximately 90% of BART's energy needs when they come online in 2021. As BART's energy needs increase between 2021-2026, due to the addition of SVBX service and the new train control system, the projects will then meet approximately 75% of BART's energy needs for the remainder of the PPAs. These projects will exceed the initial goals set out in the WEPP and put BART well on the path of achieving 100% of its electric power from eligible renewable sources by 2045.

The Office of the General Counsel will approve the PPAs as to form.

FISCAL IMPACT:

The costs of the PPAs will be incurred over the 20-year delivery terms beginning in 2021 and will be paid for from the District's annual energy operating budget (account 682300, department 1104474). The weighted average price for the two PPAs is 3.23 cents per kWh. Over the 20-year terms of the PPAs, the projects will cost approximately $12.5 million per year, or $251 million total. Cost savings are estimated to be $4.5 million in the first year of delivery, increasing to $13.4 million in Year 20, for total savings of approximately $174 million over the delivery terms as compared with current projections used in long-term budget forecasting (including the 2017 SRTP).

	Year 1	Year 5	Year 10	Year 15	Year 20	Total
Contract Cost	$12.9M	$12.7M	$12.6M	$12.4M	$12.3M	$251.4M
Est. Savings	$4.5M	$6.2M	$8.5M	$11.1M	$13.4M	$173.9M

**There is no fiscal impact on available un-programmed District Reserves.*

ALTERNATIVES:

Not entering into these PPAs with NextEra Energy and Recurrent Energy. This would a) delay the District's progress in transitioning to a renewable energy portfolio and b) require entering into short term contracts that are subject to price volatility, both of which are counter to the goals laid out in the WEPP.

RECOMMENDATION:
Adoption of the following motion.

MOTION:

The General Manager, or her designee, is authorized to enter into a 20-year PPA with NextEra Energy and a 20-year PPA with Recurrent Energy.

Wholesale Renewable Energy Power Purchase Agreements

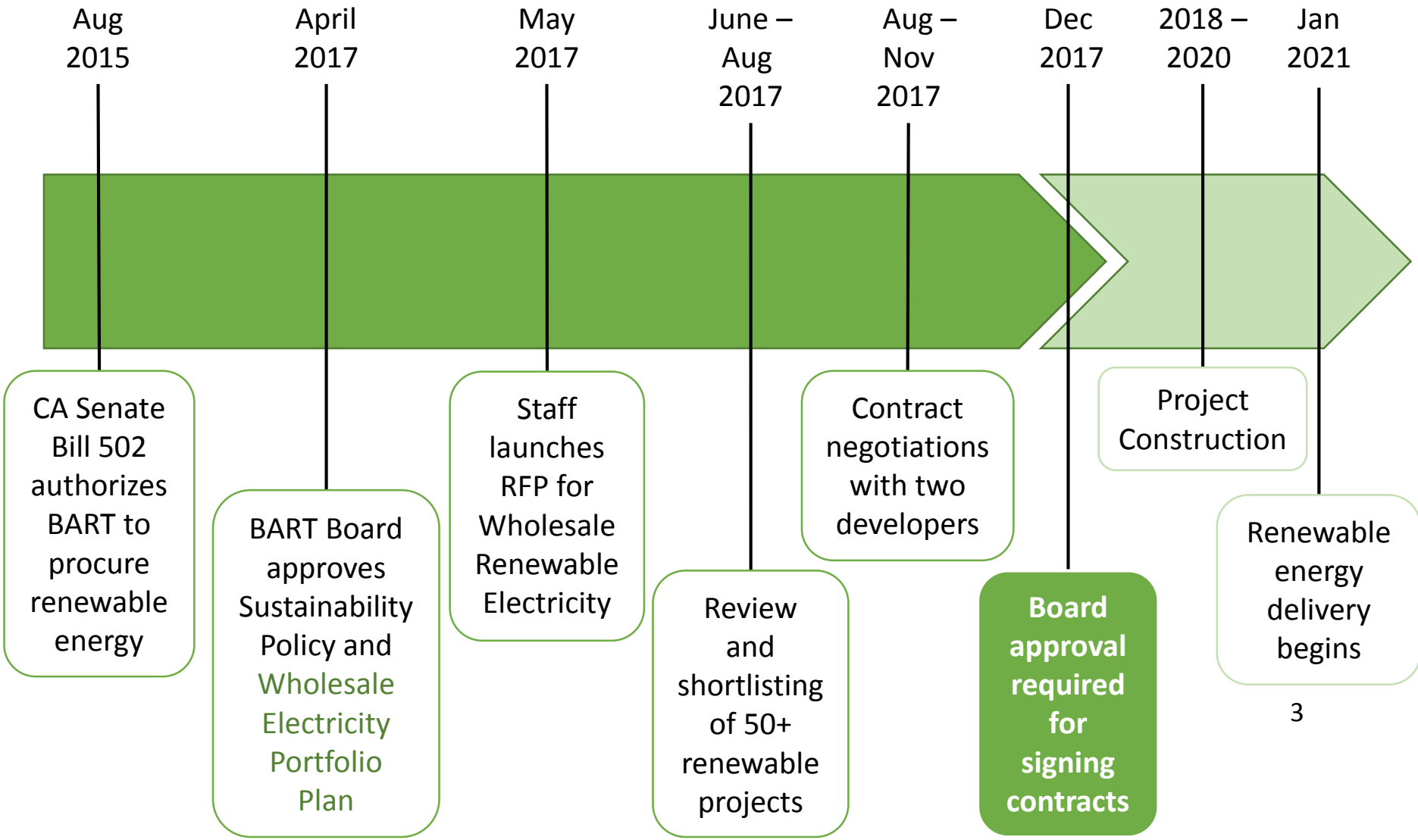
BART Board of Directors

December 7, 2017

District Energy Facts

- District uses about 400,000 MWh every year, slightly more than the City of Alameda, making it one of the largest users in Northern CA.
- District electricity costs are about $41 million per year.
- Electricity is the 2nd largest cost after labor.
- Currently about 4% of the District's electricity portfolio comes from renewable energy. With the execution of these PPAs, about 90% of the portfolio will come from renewable energy in 2021 and about 75% beginning in 2025, as the District's load increases.

Timeline of Renewable Energy Procurement



Wholesale Electricity Portfolio Policy: Performance Measures

1. Maintain a long-term cost advantage compared to rates that BART would otherwise pay as a bundled utility customer; and
2. Maintain per unit energy costs within BART's Short Range Transit Plan (SRTP) projections; and
3. Achieve a portfolio that:
    - Has an average emission factor no greater than 100 lbs-CO2e/MWh during the period 2017 through 2024 (inclusive).
    - Is from at least 50% Eligible Renewable sources and from at least 90% low and zero carbon sources by 2025.
    - Is 100% from zero carbon sources by 2035.
    - Is 100% from Eligible Renewable sources by 2045.

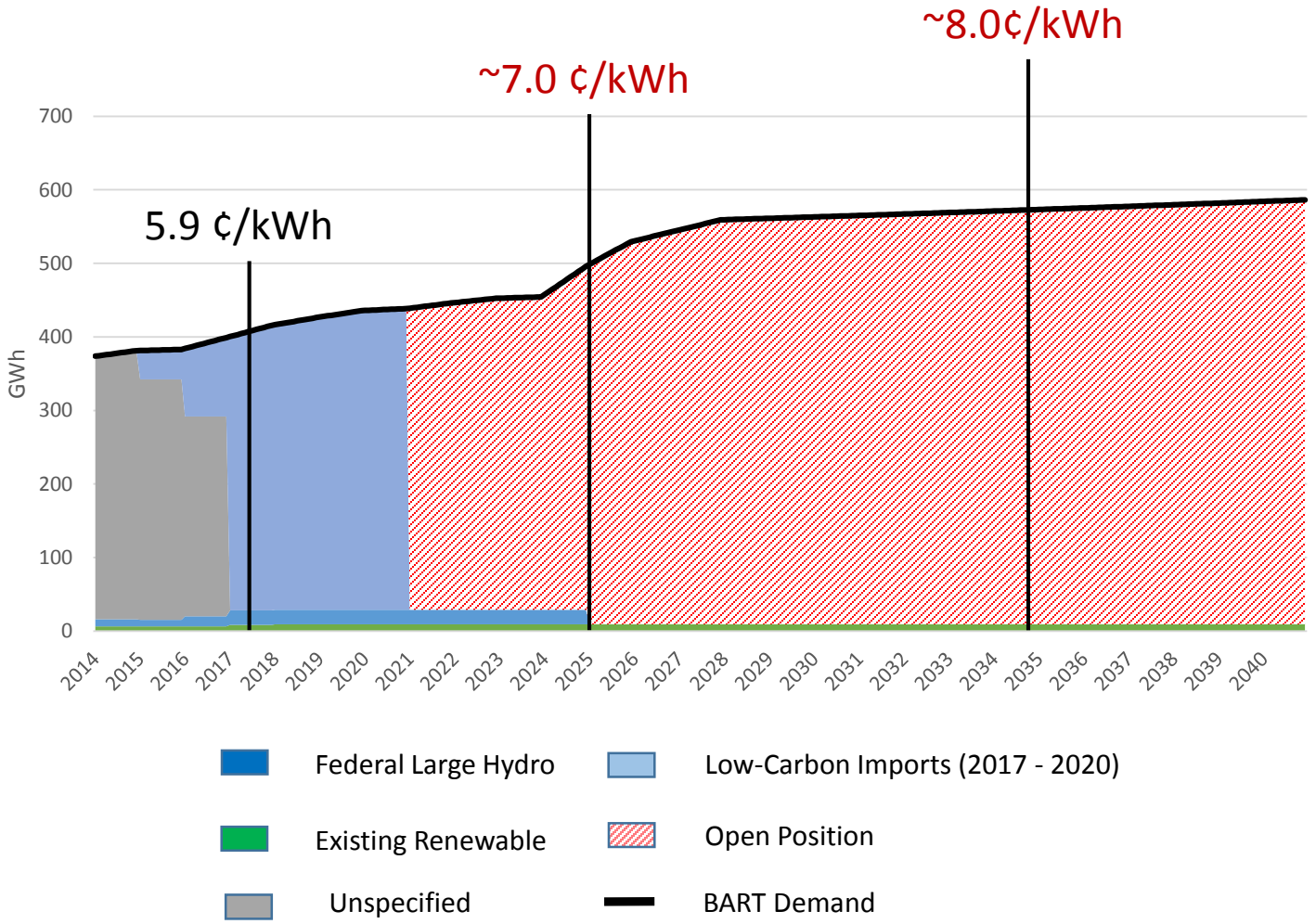
Renewable RFP Objectives

- Align procurement with Board Policy.
- Purchase long-term (10-30 year) renewable supply at stable, competitive prices.
- Ensure developers are experienced and creditworthy, and contracts mitigate BART's exposure to market, development and production risks.
- Ensure projects are realistic and far along in preconstruction planning.
- Ensure BART's risks during delivery terms are minimized.

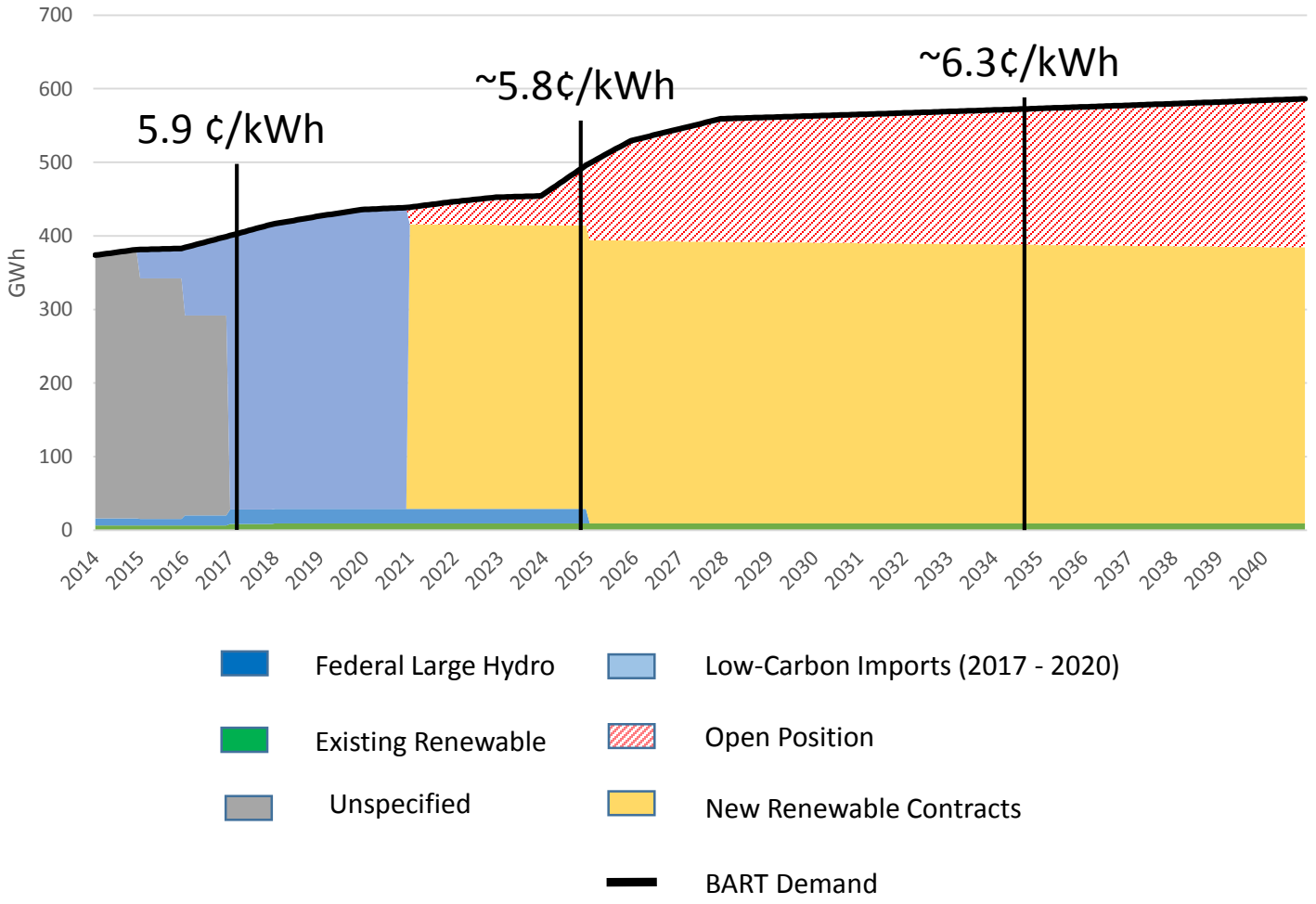
Renewable Energy Contract Details

Developer	NextEra Energy	Recurrent Energy
Project Name	Sky River	Gaskell West 2
Technology	Wind Energy	Solar Energy
Location	Kern County (East of Bakersfield)	Kern County (Southeast of Bakersfield)
Term	1/1/2021 – 12/31/2040	1/1/2021 – 12/31/2040
Project Size	61.7 MW	45 MW
Expected Output	257,000 MWh/Year	142,000 MWh/Year

BART Energy Supply without Renewable Contracts



BART Energy Supply with Renewable Contracts



2018 BART Customer Satisfaction Study

BART Marketing and Research Department
Corey, Canapary & Galanis Research

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INTRODUCTION

BART's Customer Satisfaction Study is a tool to help BART prioritize efforts to achieve higher levels of customer satisfaction. The study involves surveying BART customers every two years to determine how well BART is meeting customers' needs and expectations. These surveys, initiated in 1996, are conducted by an independent research firm.

The BART Board of Directors, management and staff use customer satisfaction surveys to focus on specific service areas and issues important to BART customers. Making informed choices allows BART to better serve current riders, attract new customers, and enhance the quality of life in the Bay Area.

This report is based on 5,294 questionnaires completed by BART customers. These customers were surveyed while riding on randomly selected BART cars during all hours of operation on weekdays and weekends during an approximately five-week period in September/October 2018.

The Executive Summary in the next section highlights key findings from the survey. Subsequent sections present detailed analyses of the factors that influence customer satisfaction and a full description of the survey methodology, including a copy of the questionnaire.

The initial survey questions ask customers to describe their use of the system. Customers are then asked three key opinion tracking questions focusing on:

- Overall satisfaction;
- Willingness to recommend BART; and
- Perceptions of BART's value for the money.

In addition, the survey probes for ratings of 46 specific service attributes, ranging from on-time performance to station cleanliness. BART uses the service attribute ratings to set priorities for customer satisfaction initiatives.

It should be noted that a number of changes have occurred since the previous study in September 2016. Those which might have influenced customers' perceptions include:

- A continuation of high weekday ridership especially during peak periods, contributing to crowding on trains and station platforms. Although weekday ridership has declined slightly compared to the last survey period two years ago (-2%), it remains well above all prior survey periods at nearly 433,000 daily trips in September 2018.
- The impacts of the Bay Area homeless crisis. According to the 2019 Homeless Census, homelessness increased substantially between 2017 and 2019 in all of the counties BART serves.[1] This has led to an increase in the number of people seeking shelter in BART stations and on BART trains, which has impacted customers' perceptions of cleanliness and safety on BART.
- The impacts of the national opioid and methamphetamine epidemics, which have also impacted customers' perceptions of cleanliness and safety on BART.[2]

[1] Increases in homelessness by county between 2017 and 2019: Alameda County: +43%; Contra Costa County: +43%; San Francisco County: +17%; San Mateo County: +21%. (Homeless Census 2019)
[2] In San Francisco County, Emergency Department visits due to opioid overdoses jumped from 41.5 visits/100,000 residents in 2016 to 58.6 visits/100,000 residents in 2018 (CA Dept. of Public Health).

- While violent crimes on BART remain rare, there has been heightened awareness of security issues after media coverage of several high-profile crimes that occurred on BART since the 2016 survey. The crimes included a fatal stabbing a couple of months prior to the 2018 survey and a group robbery onboard a train in 2017.
- Continued weekend service closures for track repairs and other infrastructure improvements, including a major rebuilding project between 19th St. and West Oakland that involved four weekend closures in August and September 2018.
- New station openings: Warm Springs / South Fremont (March 2017), Pittsburg Center, and Antioch (both in May 2018).
- The roll-out of new Fleet of the Future cars, beginning in January 2018. At the time of the survey, there was one new ten-car consist in revenue service, running on the Orange line (Richmond / Warm Springs).
- Fare changes in January 2018. Overall fares increased by 2.7% based on BART's inflation-based formula. In addition, in an effort to shift more customers to Clipper cards, a 50 cent charge was added to rides made with BART blue tickets. The youth discount was extended from age 12 to age 18 and changed to 50%.
- Proof-of-Payment ordinance, implemented in January 2018. This requires passengers to present a valid ticket or Clipper card within the paid area of the BART system upon request by authorized BART personnel.

EXECUTIVE SUMMARY

While greater than half of riders give BART positive ratings on key satisfaction questions, these ratings have declined significantly since 2016.

- 56% say they are very or somewhat satisfied with BART. This is down 13 percentage points since 2016.
- 73% would definitely or probably recommend BART to a friend or out-of-town guest. This is a decrease of 12 percentage points since 2016.
- 54% agree strongly or somewhat that "BART is a good value for the money." This has dropped five percentage points since 2016.

Percent of BART customers saying they…	2014	2016	2018
Are **very or somewhat satisfied** with the services provided by BART……	74%	69%	56%
Would **definitely or probably recommend** BART……	89%	85%	73%
Agree strongly or somewhat that BART is a good value for the money...	63%	59%	54%

Key factors behind the decline in customer satisfaction continue to be: crowding, cleanliness, and aging trains and stations. In addition, concerns about personal security on BART have risen dramatically, likely driven by high profile incidents, as well as day-to-day quality of life issues that impact how safe riders feel on BART. These issues include drug use and criminal activity on or near BART, untreated mental illness, fare evasion, homelessness, and panhandling.

In light of this, BART has prioritized customer safety with continued emphasis on addressing these quality of life issues. This year's approved budget includes funding for 19 additional police officers and four additional fare inspectors. The survey data show that customers' ratings of personal security on BART are strongly correlated with their ratings of police presence on BART.

To address the impact of the Bay Area's homeless crisis, BART is expanding Homeless Outreach Teams to include all four of BART's counties. The teams consist of outreach workers who try to connect homeless individuals on or near BART with needed social services. BART is also expanding its well-received elevator attendant program to all four downtown San Francisco stations. Started in April 2018 at Civic Center and Powell stations, it has virtually eliminated inappropriate behavior in elevators and is highly rated by BART customers.

To address station cleanliness, BART will hire 15 additional station cleaners. This will help bolster BART's revamped cleaning efforts, which include focused overnight cleanings of the system's busiest stations.

As for issues related to crowding, BART's new Fleet of the Future train cars are steadily rolling out. While only one ten-car train was in service at the time of the survey, there are currently six trains running. As more cars are put into revenue service, BART will be able to lengthen more trains to ten cars and help reduce crowding.

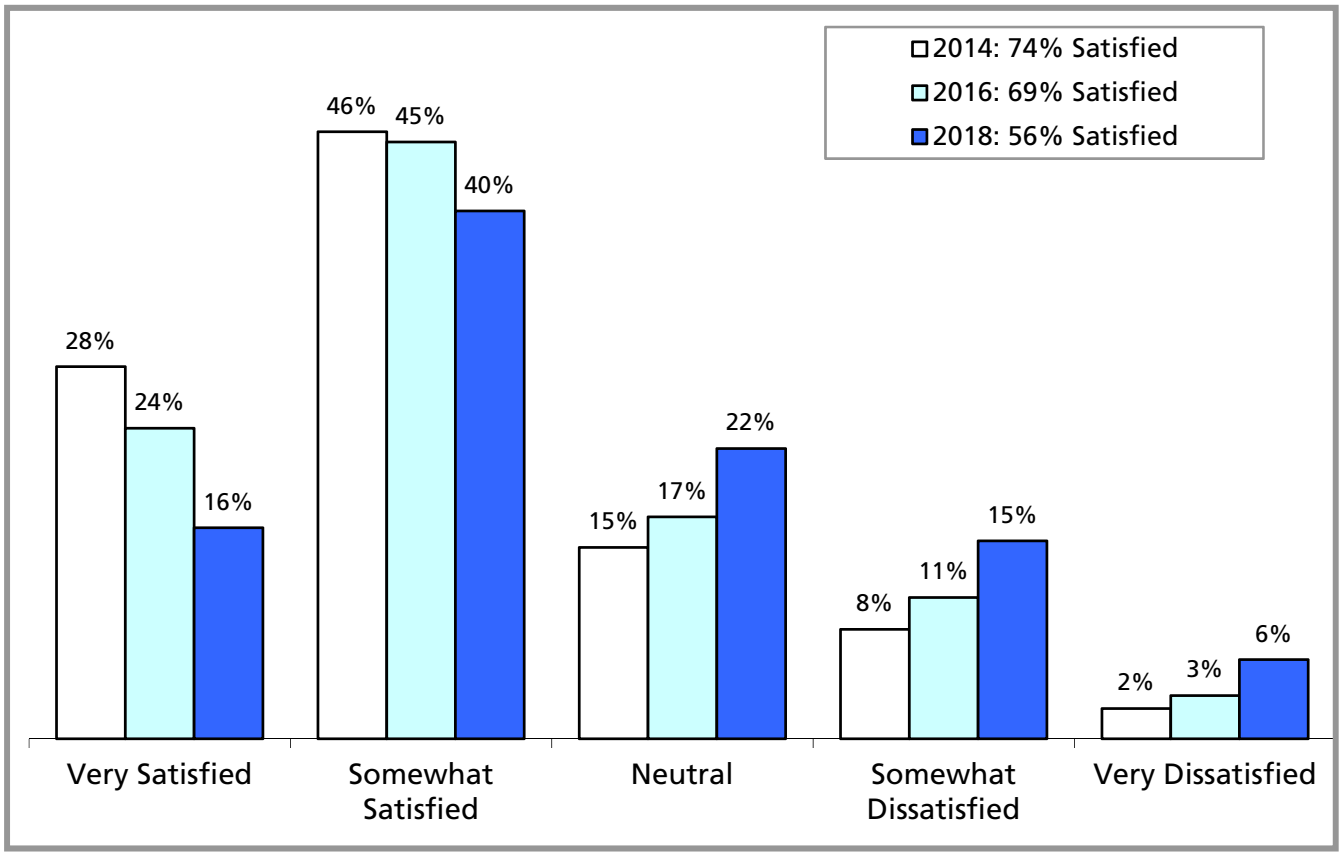
Many projects to renew the aging system are underway, funded by voter-approved Measure RR.

At the beginning of the survey period, a critical section of track between 19th St. Oakland and West Oakland was rebuilt over the course of four weekends. Projects like this, while behind-the-scenes, will help to improve the system's reliability for years to come. Another renovation project that customers will begin to see in 2020 is a massive escalator replacement project. A total of 41 escalators in downtown San Francisco will be replaced, resulting in more reliable escalators at the system's busiest stations.

DETAILED RESULTS

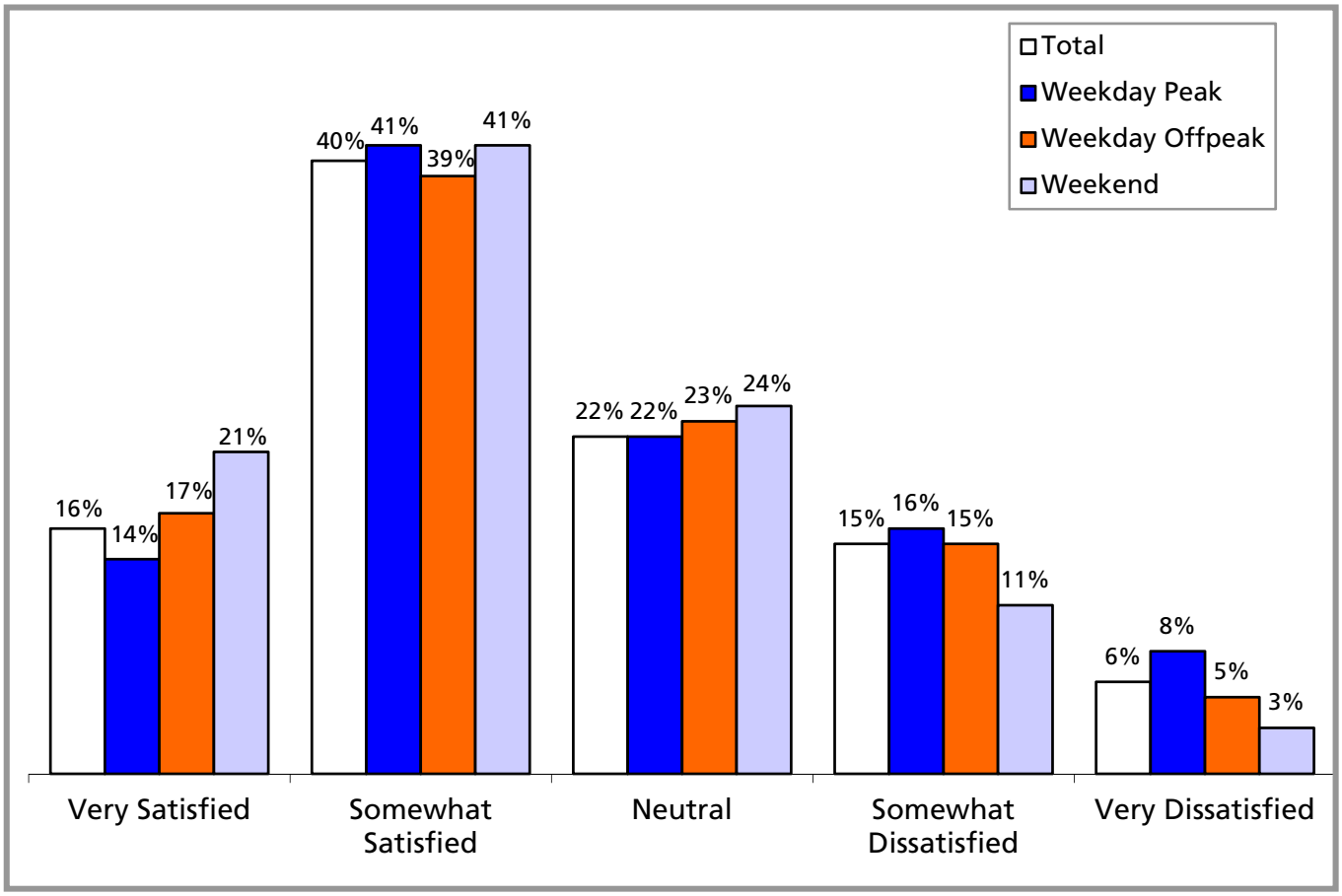
OVERALL SATISFACTION - TRENDING
(2014 / 2016 / 2018 Comparison)

Overall satisfaction measured by those who are **very satisfied** or **somewhat satisfied** has dropped to 56% in 2018, down from 69% in 2016 and 74% in 2014. This was driven by declines in both those who are **very satisfied and somewhat satisfied**.



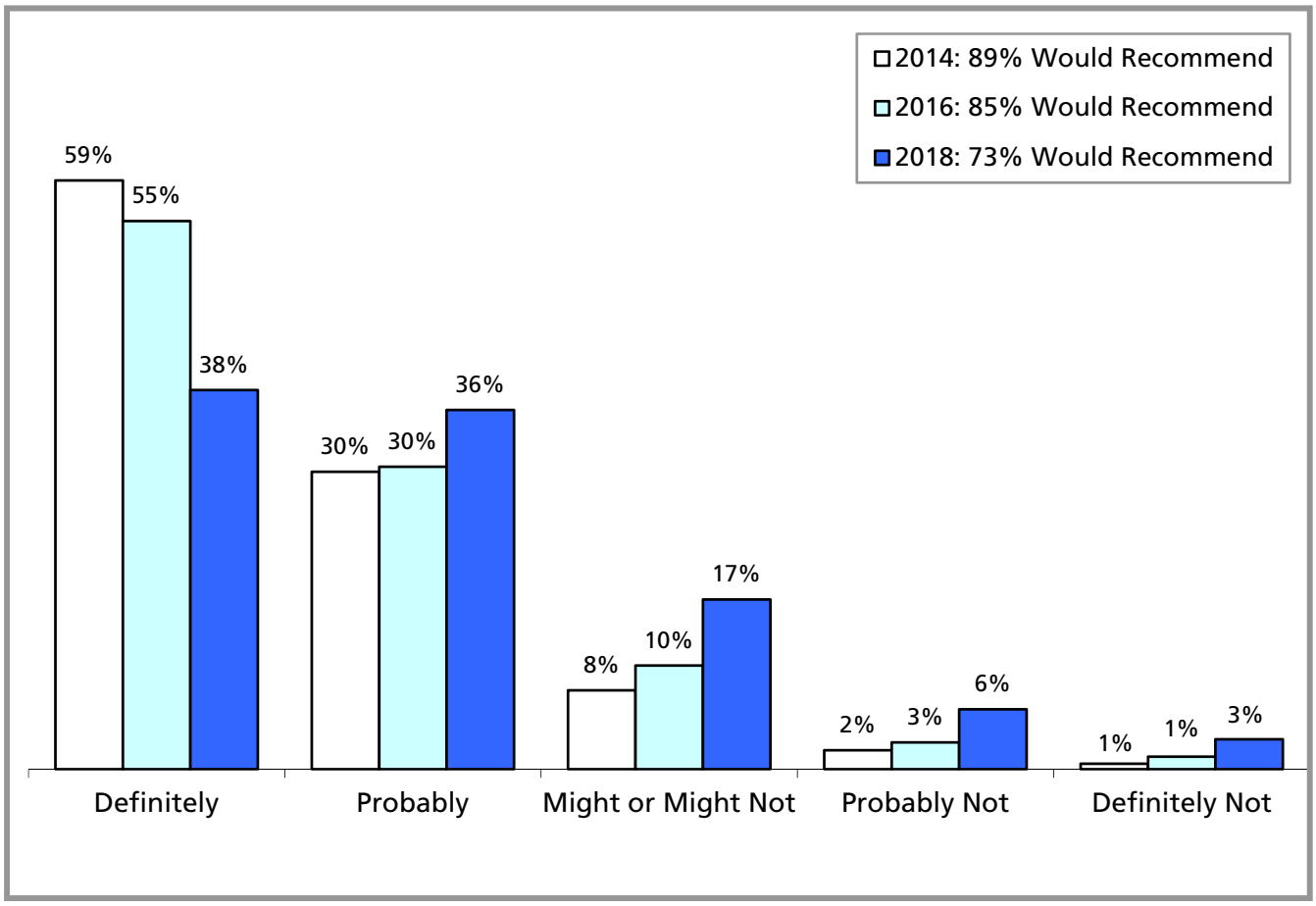
2018 OVERALL SATISFACTION
(Peak / Off-Peak / Weekend Comparison)

While overall satisfaction is at 56%, there are some differences among customers who ride during different time periods, most notably that weekend riders tend to be more satisfied than weekday riders.



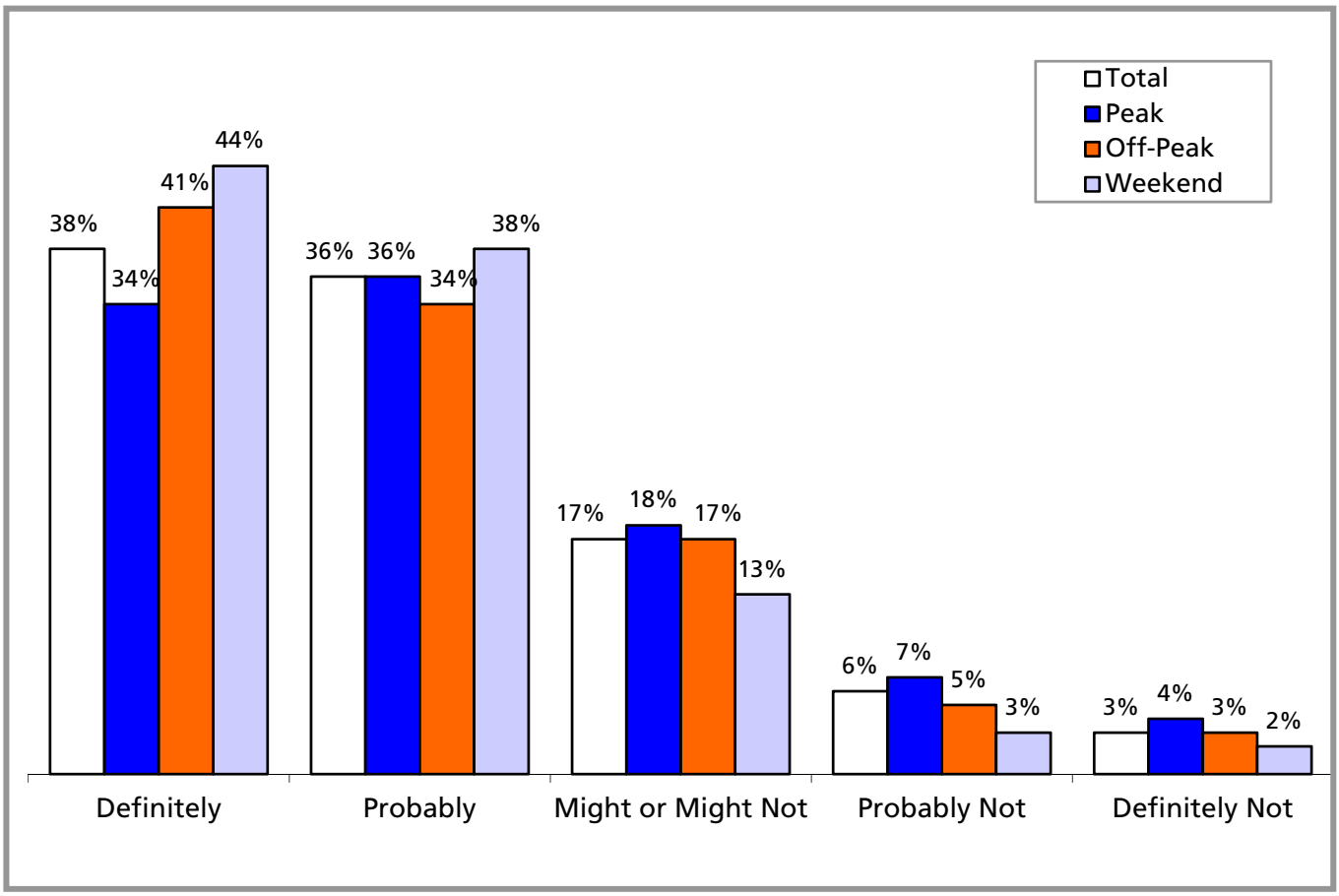
WILLINGNESS TO RECOMMEND BART - TRENDING
(2014 / 2016 / 2018 Comparison)

Overall willingness to recommend BART continued to decline in 2018, driven by a decline in the "definitely" recommend category.



2018 WILLINGNESS TO RECOMMEND BART
(Peak / Off-Peak / Weekend Comparison)

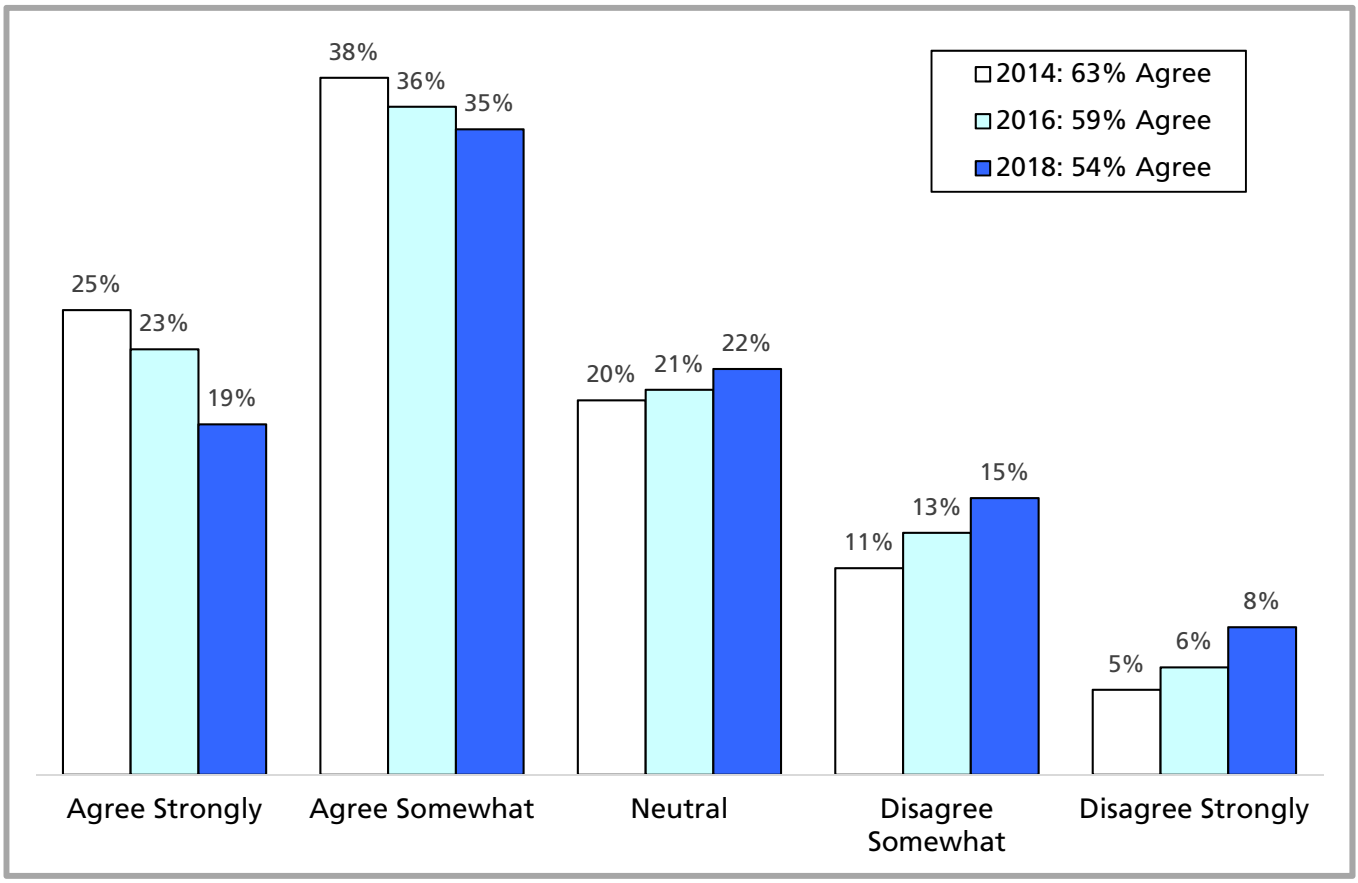
Peak period customers are less likely to definitely recommend BART than off-peak and weekend riders.



PERCEPTION OF BART AS GOOD VALUE - TRENDING
(2014 / 2016 / 2018 Comparison)

While greater than half (54%) see BART as a good value, this rating has declined since 2014. In 2018, the decline was primarily driven by a drop in the "Agree strongly" category.

"Value" has two components – satisfaction and price. Since the decline here is not as steep as the decline in overall satisfaction, the decline may have been tempered by the fact that fares have increased less than the rate of inflation.

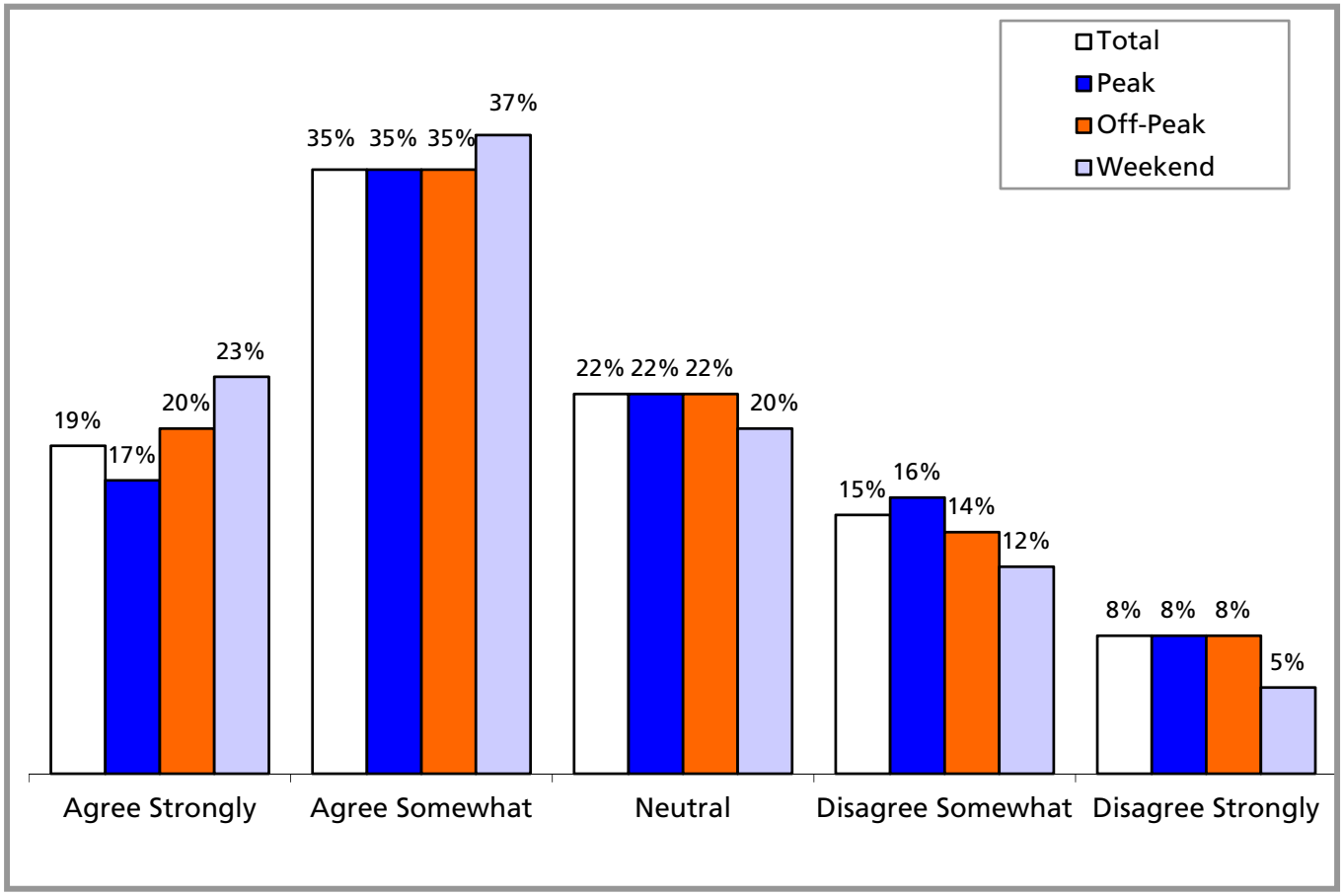


2018 PERCEPTION OF BART AS GOOD VALUE

(Peak / Off-Peak / Weekend Comparison)

Fewer peak period riders agree strongly that BART is a good value for the money, as compared to off-peak and weekend customers.

Peak period customers generally ride BART five or more days per week, so the aggregate fares they pay far exceed fares paid by off-peak and weekend customers. While off-peak and weekend customers generally ride BART less frequently, they are a much larger group of people overall and are an important part of public support for the BART system.



SPECIFIC SERVICE ATTRIBUTES

In the 2018 survey, customers rated BART on 46 specific service attributes. The chart on the opposite page shows mean ratings for each of these 46 service attributes. Items appearing towards the top of the chart are rated highest, while items appearing at the bottom are rated lowest. The average rating (on a scale from 1 = Poor to 7 = Excellent) is shown next to the bar for each item. Given the large sample sizes, mean ratings are generally accurate to within ±0.05 at a 95% confidence level.

BART received the highest ratings for:

- Clipper cards
- Availability of maps and schedules
- BART tickets
- bart.gov website
- On-time performance

BART received the lowest ratings for:

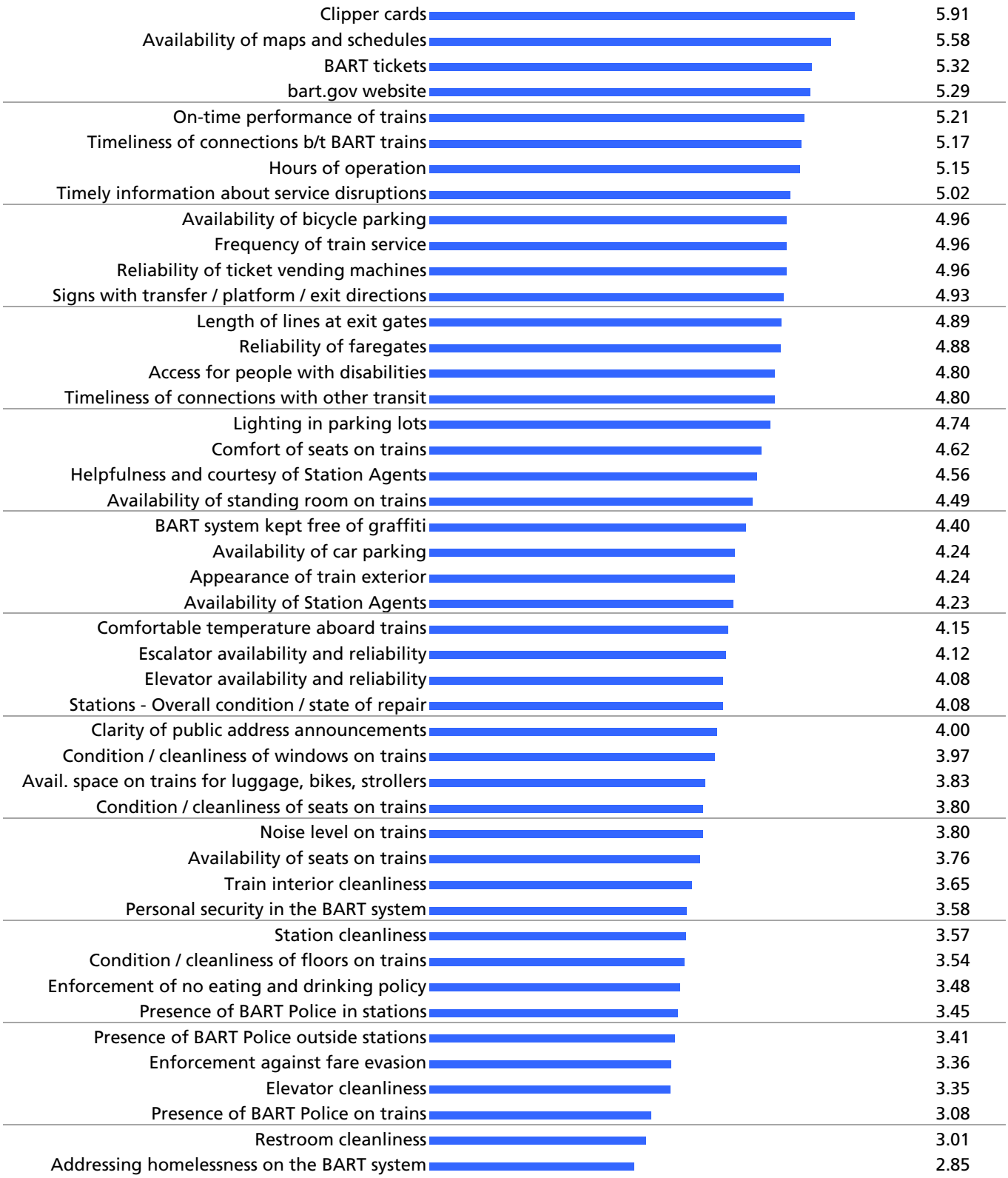
- Addressing homelessness on the BART system
- Restroom cleanliness
- Presence of BART Police on trains
- Elevator cleanliness
- Enforcement against fare evasion

Note that the lowest rated attribute "Addressing homelessness on the BART system" was a new attribute added to the 2018 questionnaire.

For a chart showing the percentage results, please see Appendix D.

2018 RATING OF SPECIFIC SERVICE ATTRIBUTES

Mean Rating (7-point scale)



Among the 46 attributes, 29 showed statistically significant declines between 2016 and 2018. Of the remaining 17 attributes, five showed statistically significant increases, nine were essentially flat (changes were not statistically significant), and three were not asked in 2016.

The chart in the next sub-section shows the percent change in the mean rating from 2016 to 2018. For details on statistical significance, refer to Appendix C.

The attributes with the largest declines were:

- Enforcement against fare evasion (-19.8%)
- Personal security in the BART system (-16.4%)
- Presence of BART Police in stations (-14.6%)
- Train interior cleanliness (14.1%)
- Condition / cleanliness of floors on trains (-12.6%)
- Presence of BART Police on trains (-12.3%)

The attributes with statistically significant increases were:

- Noise level on trains (+3.5%)
- Hours of operation (+3.0%)
- bart.gov website (+2.9%)
- Availability of standing room on trains (+2.0%)
- Clipper cards (+1.0%)

Fare evasion is increasingly a concern of BART customers. This issue not only results in lost revenue that can't be reinvested in the BART system, but also in other issues that impact the BART customer experience when those who don't pay their fare also break other BART rules. BART has put considerable effort into addressing this issue, including implementing a Proof-of-Payment system and investing in station hardening throughout the system.

The Proof-of-Payment system requires that passengers show their valid Clipper card or BART ticket upon request by authorized BART personnel, and went into effect in January 2018. BART's budget for this year includes hiring four additional fare inspectors in support of this effort.

Station hardening efforts include raising railings, securing swing gates, moving elevators into paid areas, installing escalator canopies, and modifying faregates. It is expected that over half of BART stations will be hardened by the end of June 2020.

While violent crime on BART is rare, riders' perceptions of *personal security* have been impacted both by high profile incidents and quality of life issues that impact how safe they feel on BART. Passengers also commented on the survey about situations that made them feel unsafe on or near BART property, involving drug use and other criminal activity, untreated mental illness, fare evasion, homelessness, and panhandling.

Looking at ratings of other attributes on the survey, the following were correlated with personal security in the BART system: police presence (in stations, outside of stations, on trains), enforcement against fare evasion, and addressing homelessness on the BART system.

To address personal security, BART's current budget has prioritized quality of life issues, with funding to hire 19 additional police officers. Also included is continued funding to support and expand homeless outreach programs, as well as elevator attendants at additional downtown San Francisco stations. (The attendant program has virtually eliminated inappropriate behavior in

the elevators at stations where it's been implemented.)

With regards to the *police presence* attributes, these are associated with riders' feelings of personal security as noted above. BART is addressing this issue by stepping up efforts and offering hiring bonuses to recruit new police officers – both to reduce the vacancy rate, as well as to expand the force. By spring of 2019, BART had reduced the vacancy rate on its police force from a high of 41 down to 20. And, as noted above, funding has been allocated to hire an additional 19 police officers, a significant investment toward increasing police presence systemwide.

With regards to *train cleanliness* attributes, customer comments indicated that issues pertaining to homelessness, biohazards, and unpleasant smells contributed to their low ratings. BART implemented rapid response train cleaners in 2018 to address cleanliness issues requiring immediate attention. Cleaners are positioned on specific mid-line station platforms, where they can quickly intercept a train and clean messes from cars as reports come in. This is in addition to end of line train car cleaners who walk the length of each car at the end of a run. BART also added a feature to its website, mobile website, and app where riders can easily report biohazards.

Looking at the attributes with rating increases, customers gave higher ratings to *noise level on trains*. BART has made substantial progress in reducing train noise by implementing a new wheel "profile," or shape. This new tapered profile is designed to reduce wear and damage to the rail, thus reducing noise. At the start of the survey period, most of BART's legacy fleet (84%) had been converted to the new wheel profile, and the remainder was completed by December 2018. (All of BART's new Fleet of the Future train cars have the new wheel profile.) To take full advantage of the benefits of the new wheel profile, BART will continue to grind the rail to optimize its fit with the new wheels. As of summer 2019, 36% of the rail work had been completed.

With regard to *availability of standing room on trains*, BART modified more than half (57%) of its legacy fleet to increase capacity by removing seven seats. This modification was completed in summer 2017. Also, as more Fleet of the Future cars continue to come online, trains can be lengthened to reduce crowding.

SERVICE ATTRIBUTE RATINGS: PERCENTAGE CHANGES

2018 vs. 2016 comparisons (sorted in ascending order on % change)

SCALE: 1 = Poor, 7 = Excellent	2018 Mean	2016 Mean	Difference	% Change (mean)	Statistically Significant at 95% Conf. Level?
Enforcement against fare evasion	3.36	4.19	-0.83	-19.8%	yes
Personal security in the BART system	3.58	4.28	-0.70	-16.4%	yes
Presence of BART Police in stations	3.45	4.04	-0.59	-14.6%	yes
Train interior cleanliness	3.65	4.25	-0.60	-14.1%	yes
Condition / cleanliness of floors on trains	3.54	4.05	-0.51	-12.6%	yes
Presence of BART Police on trains	3.08	3.51	-0.43	-12.3%	yes
Enforcement of no eating and drinking policy	3.48	3.93	-0.45	-11.5%	yes
Restroom cleanliness	3.01	3.39	-0.38	-11.2%	yes
Condition / cleanliness of seats on trains	3.80	4.23	-0.43	-10.2%	yes
Elevator cleanliness	3.35	3.71	-0.36	-9.7%	yes
Station cleanliness	3.57	3.93	-0.36	-9.2%	yes
Availability of Station Agents	4.23	4.58	-0.35	-7.6%	yes
Stations - Overall condition / state of repair	4.08	4.37	-0.29	-6.6%	yes
Condition / cleanliness of windows on train	3.97	4.22	-0.25	-5.9%	yes
Comfortable temperature aboard trains	4.15	4.38	-0.23	-5.3%	yes
Appearance of train exterior	4.24	4.46	-0.22	-4.9%	yes
Escalator availability and reliability	4.12	4.33	-0.21	-4.8%	yes
Helpfulness & courtesy of Station Agents	4.56	4.79	-0.23	-4.8%	yes
Comfort of seats on trains	4.62	4.85	-0.23	-4.7%	yes
Elevator availability and reliability	4.08	4.28	-0.20	-4.7%	yes
Access for people with disabilities	4.80	5.03	-0.23	-4.6%	yes
Timely information about service disruptions	5.02	5.24	-0.22	-4.2%	yes
Lighting in parking lots	4.74	4.92	-0.18	-3.7%	yes
Availability of seats on trains	3.76	3.86	-0.10	-2.6%	yes
BART tickets	5.32	5.45	-0.13	-2.4%	yes
Clarity of public address announcements	4.00	4.08	-0.08	-2.0%	yes
Timeliness of connections between BART trains	5.17	5.25	-0.08	-1.5%	yes
Availability of maps and schedules	5.58	5.65	-0.07	-1.2%	yes
Reliability of ticket vending machines	4.96	5.02	-0.06	-1.2%	no
On-time performance of trains	5.21	5.27	-0.06	-1.1%	yes
Reliability of faregates	4.88	4.93	-0.05	-1.0%	no
Signs with transfer / platform / exit directions	4.93	4.97	-0.04	-0.8%	no
Avail. of space on trains for luggage, bikes, strollers	3.83	3.86	-0.03	-0.8%	no
Frequency of train service	4.96	4.98	-0.02	-0.4%	no
Availability of bicycle parking	4.96	4.97	-0.01	-0.2%	no
Timeliness of connections with other transit*	4.80	4.79	0.01	0.2%	no
Availability of car parking	4.24	4.23	0.01	0.2%	no
Length of lines at exit gates	4.89	4.85	0.04	0.8%	no
Clipper cards	5.91	5.85	0.06	1.0%	yes
Availability of standing room on trains	4.49	4.40	0.09	2.0%	yes
bart.gov website	5.29	5.14	0.15	2.9%	yes
Hours of operation	5.15	5.00	0.15	3.0%	yes
Noise level on trains	3.80	3.67	0.13	3.5%	yes
BART system kept free of graffiti^	4.40	Not asked in 2016			
Presence of BART Police outside stations^	3.41	Not asked in 2016			
Addressing homelessness on the BART system	2.85	Not asked in 2016			

* In 2016, this was listed as "Timeliness of connections with buses."

^ Similar attributes were used in 2016, but they are not compared due to the text changes. In 2016, there were two attributes for graffiti: "Stations kept free of graffiti" and "Train interior kept free of graffiti." In 2016, the attribute regarding police outside of stations was phrased as "Presence of BART Police in parking lots."

QUADRANT ANALYSIS

The chart on page 21 (titled "2018 Quadrant Chart") is designed to help set priorities for future initiatives to improve customer satisfaction. This chart quantifies how important each service characteristic appears to be from a customer perspective (using the vertical axis) and shows the average customer rating for each characteristic (using the horizontal axis). For a more detailed description of how this chart is derived, see Appendix G.

The vertical axis crosses the horizontal axis at the average (mean) performance rating from the benchmark survey in 1996. This vertical axis has remained in this location in all subsequent surveys so that Quadrant Charts can easily be compared year-to-year.

The "Target Issues" quadrant identifies those service attributes which appear to be most important, but which receive relatively low ratings from BART riders. Based on the vertical axis used since 1996, target issues include the 20 attributes listed below. Compared to the 2016 chart, there are six new target issues, which are identified in bold type below. These six new target issues include two of the three new attributes (identified with asterisks) that were added to the 2018 questionnaire.

- Station condition / state of repair
- Condition / cleanliness of seats on trains
- Train interior cleanliness
- Personal security in the BART system
- Condition / cleanliness of floors on trains
- Station cleanliness
- Availability of seats on trains
- Availability of standing room on trains
- Comfortable temperature aboard trains
- **Comfort of seats on trains**
- Availability of space on trains for luggage, bicycles, and strollers
- **Elevator cleanliness**
- **Restroom cleanliness**
- **Condition / cleanliness of windows on trains**
- Presence of BART Police in stations
- Appearance of train exterior
- **Presence of BART Police outside stations***
- **Addressing homelessness on the BART system***
- Elevator availability and reliability
- Escalator availability and reliability

*These attributes were added to the 2018 questionnaire. Note that "Presence of BART Police outside stations" replaced "Presence of BART Police in parking lots." "Presence of BART Police in parking lots" also appeared as a Target Issue in the 2016 quadrant chart.

In looking at the types of attributes in the Target Issues quadrant, they can be categorized into three groups – related to quality of life, train cars / capacity, or elevators / escalators.

1. Those that are deepest into the Target Issues quadrant (rated lowest and/or of highest importance) tend to be those related to quality of life issues, such as addressing homelessness, police presence, personal security, and cleanliness. These issues are the focus of numerous BART initiatives this year, including expanding the Homeless Outreach Teams[3] to include all four of BART's counties, hiring 19 additional police officers, expanding the elevator attendant program to all four downtown San Francisco stations[4], continuing funding for street level public restrooms ("Pit Stops") at four San Francisco stations, and hiring 15 additional station cleaners to bolster BART's revamped cleaning efforts, which include focused overnight cleanings of the system's busiest stations.

2. Those related to train cars and capacity include seat availability, standing room availability, and train temperature. Many of these will be addressed as the new Fleet of the Future cars allow BART to increase the number of cars in service over the next few years. The new cars also have improved cooling systems that distribute air directly from the ceilings, making it more comfortable for standees on hot days.

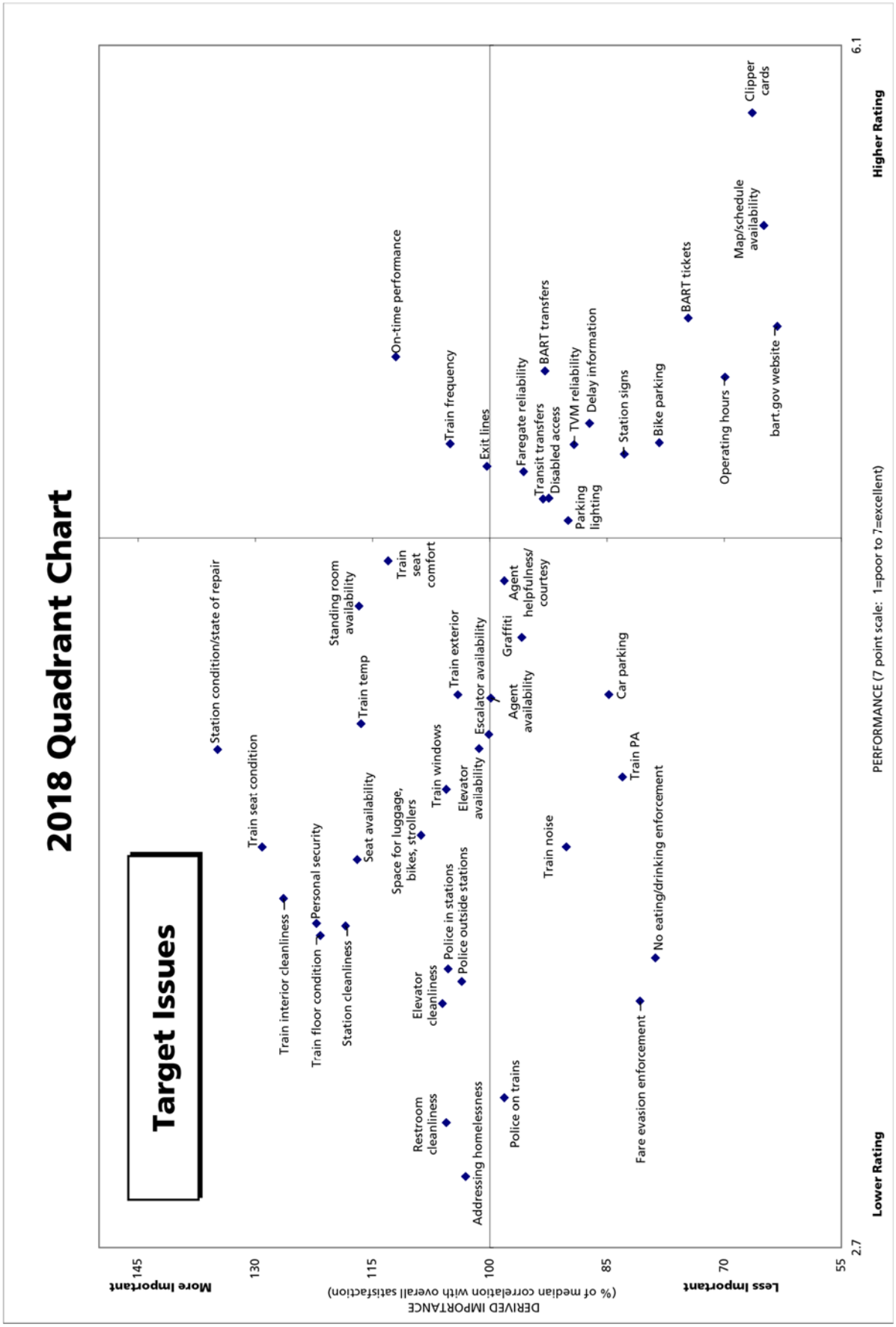
3. The third group includes escalator and elevator availability and reliability. These are the focus of many capital improvement projects over the next several years, including a massive escalator renovation project. The renovation project will replace 41 of the system's most heavily used escalators in downtown San Francisco, which regularly malfunction. Canopies are also planned for high use escalators; these facilitate more reliable escalators by keeping them cleaner and better protected from the elements. As for elevators, BART plans to install new elevators in the four downtown San Francisco stations and move them into the paid area, which will also help with fare evasion.

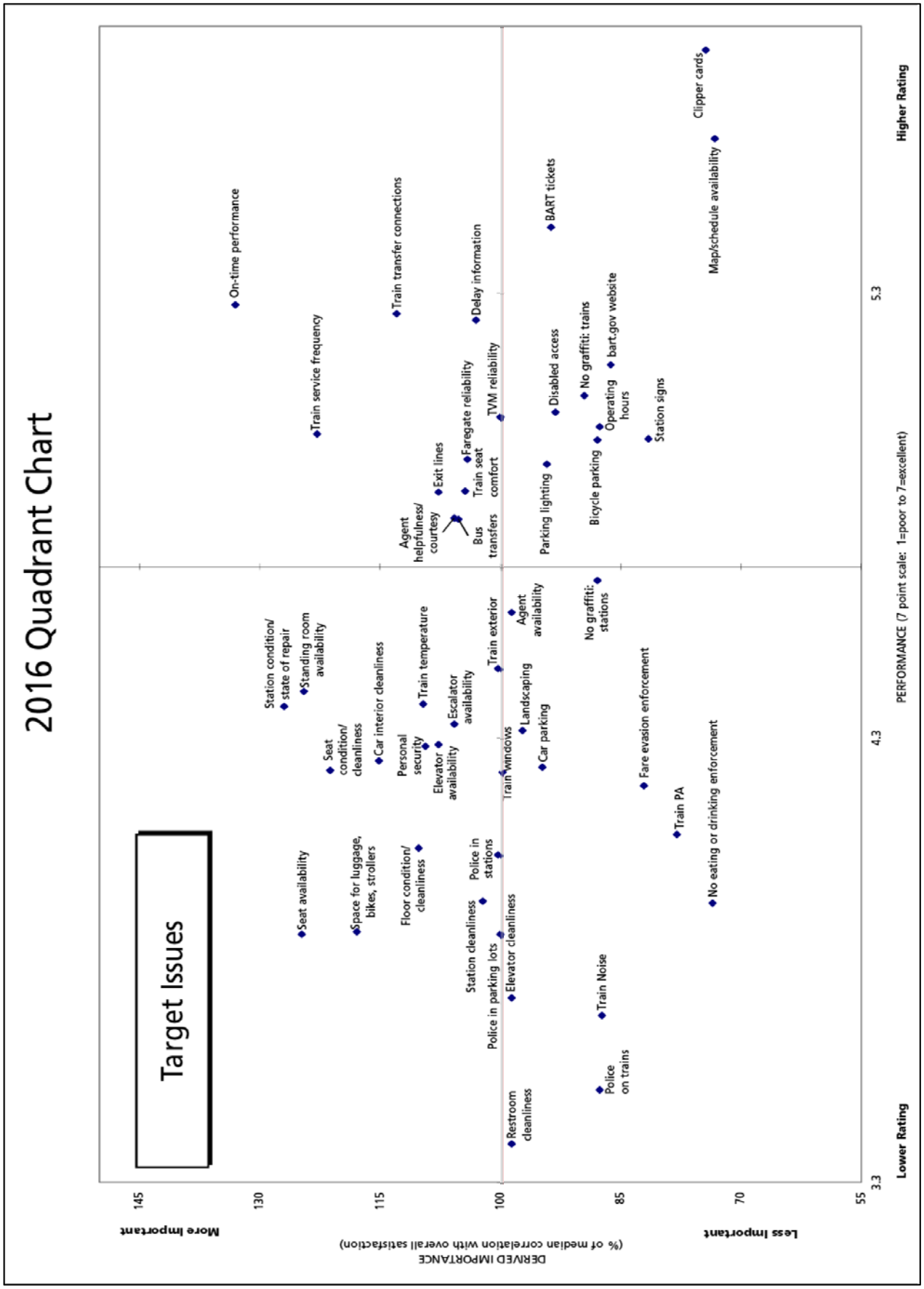
Although not a Target Issue, it is interesting to note that *on-time performance* (in the upper right quadrant) decreased substantially in importance vs. prior years. This may be the result of a combination of two factors: many quality of life issues have increased in importance, overshadowing on-time performance, and BART's actual on-time performance has improved a bit vs. two years ago (based on internal tracking metrics).

For comparison purposes, the 2016 Quadrant Chart is included after the 2018 chart.

Notes:
- The vertical axis on the charts is based on using a mean statistic of 4.685 - the average mean score of all the attributes for the 1996 benchmark study.
- The horizontal axis differs slightly on the 2018 chart, where the maximum is 6.1 and the minimum is 2.7. It was set at 5.9/3.3 in 2016.

[3] The Homeless Outreach Teams (HOT) consist of outreach workers who connect homeless individuals on or near BART with needed social services. They initially focused on the four downtown SF stations, but have since expanded to the Mission District, Contra Costa County, Alameda County, and San Mateo County.
[4] The elevator attendant program, started in April 2018 at Powell and Civic Center stations, has virtually eliminated inappropriate behavior in elevators and has been very well-received by BART customers.


2018 Quadrant Chart
Target Issues
Station condition/state of repair
Train seat: condition
Train interior cleanliness
Personal security
Train floor condition
Station cleanliness
Seat availability
Space for luggage, bikes, strollers
Elevator cleanliness
Police in stations
Police outside stations
Train windows
Elevator availability
Escalator availability
Train exterior
Train temp
Standing room availability
Train seat comfort
Agent availability
Graffiti
Agent helpfulness/ courtesy
Train noise
Car parking
Train PA
No eating/drinking enforcement
Fare evasion enforcement
Restroom cleanliness
Addressing homelessness
Police on trains
On-time performance
Train frequency
Exit lines
Faregate reliability
Transit transfers
Disabled access
Parking lighting
BART transfers
TVM reliability
Delay information
Station signs
Bike parking
Operating hours
BART tickets
Map/schedule availability
bart.gov website
Clipper cards
More Important
Less Important
DERIVED IMPORTANCE
(% of median correlation with overall satisfaction)
145
130
115
100
85
70
55
2.7
6.1
Lower Rating
Higher Rating
PERFORMANCE (7 point scale: 1=poor to 7=excellent)


2016 Quadrant Chart
Target Issues
On-time performance
Train service frequency
Train transfer connections
Delay information
TVM reliability
Faregate reliability
Exit lines
Train seat comfort
Bus transfers
Agent helpfulness/ courtesy
Parking lighting
Disabled access
BART tickets
Bicycle parking
Operating hours
bart.gov website
No graffiti: trains
Station signs
Clipper cards
Map/schedule availability
Station condition/ state of repair
Standing room availability
Seat condition/ cleanliness
Car interior cleanliness
Train temperature
Escalator availability
Personal security
Elevator availability
Train exterior
Agent availability
Landscaping
Car parking
Train windows
No graffiti: stations
Fare evasion enforcement
Train PA
No eating or drinking enforcement
Seat availability
Space for luggage, bikes, strollers
Floor condition/ cleanliness
Police in stations
Station cleanliness
Police in parking lots
Elevator cleanliness
Train Noise
Police on trains
Restroom cleanliness
145
130
115
100
85
70
55
More Important
Less Important
DERIVED IMPORTANCE
(% of median correlation with overall satisfaction)
3.3
4.3
5.3
Lower Rating
PERFORMANCE (7 point scale: 1=poor to 7=excellent)
Higher Rating

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SATISFACTION TRENDS

The chart on the next page shows overall satisfaction ratings from 1996 – 2018 on the primary axis. Average weekday ridership for September of each year is shown on the secondary axis. The chart is further annotated to show some significant factors impacting customer perceptions and use of BART.

In 1996, 80% of customers were satisfied with BART. Two years later customer satisfaction had dropped to 74%. The events most likely to influence customer satisfaction, which took place in between the two surveys, were a large fare increase (the third since 1995), a work stoppage, and aging equipment. Also, the effects of a $1.2 billion renovation program began to be felt during this period. Customer satisfaction often suffers at the beginning of a renovation program because service is impacted by cars, escalators, and elevators being taken off-line.

By 2002, customer satisfaction was back up to 80%, and in 2004, BART registered an all-time high rating of 86%. Factors that increased satisfaction probably included keeping fare increases relatively small, the opening of the extension to the San Francisco International Airport, the introduction of permit parking, and the completed renovation of cars, escalators, elevators, and fare collection equipment.

Between 2006 and 2012, satisfaction remained at a high level, reflecting residual effects of the earlier improvements.

In 2008, ridership surged as gas prices rose, and a fire in the Hayward train yard in May impacted riders on the Fremont line. However, BART improved train interior cleanliness and increased evening and Sunday train frequency beginning January 1, 2008.

Between the 2008 and 2010 surveys, BART ridership dropped 7% reflecting the impacts of the longest recession since World War II, running from December 2007 through June 2009. Between these two survey periods, unemployment in the three-county BART District rose from 6.3% to 10.6%. BART implemented a 6.1% fare increase in July 2009, six months earlier than anticipated, in order to help close a budget deficit.[5] In addition, BART reduced evening and Sunday train frequency in September 2009, effectively reversing the service increase implemented in 2008.

By the 2012 survey period, ridership had skyrocketed, topping 400,000 average weekday trips for the first time in BART's history (an increase of 14% vs. the 2010 survey period). The local economy was recovering, gas prices were on the rise, and BART customer satisfaction rebounded to 84%.

In 2014, overall satisfaction dropped ten points to 74%, as ridership surged (430,200 average weekday trips) on a system in dire need of renovation. Other factors which may have influenced customer satisfaction included two work stoppages in 2013, and fare and parking fee increases.

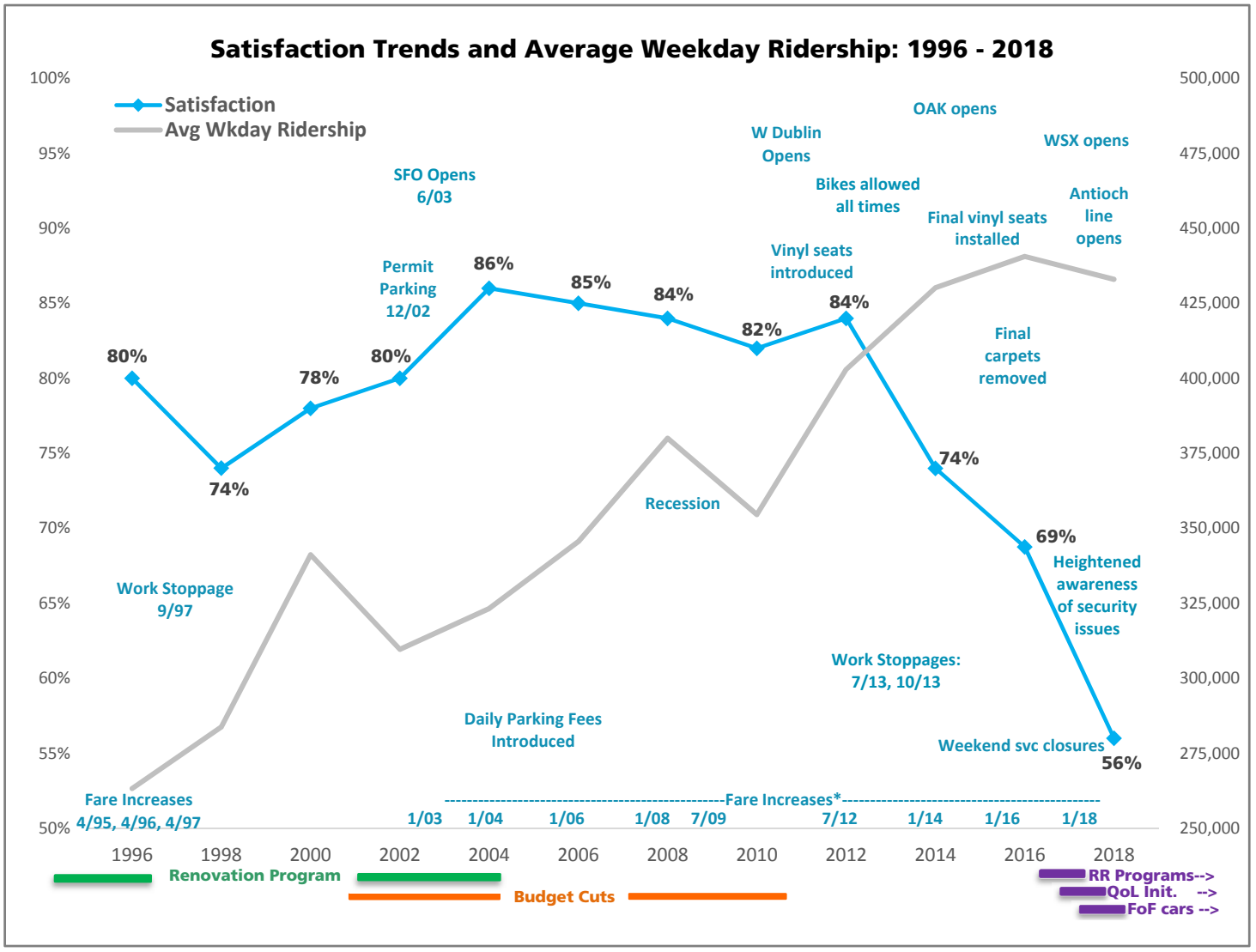
In 2016, overall satisfaction continued to erode, dropping to 69%. Ridership continued to grow, resulting in extremely crowded conditions and continuing to strain the aging system.

In 2018, overall satisfaction declined further to 56%. Although average weekday ridership has declined a bit to 433,000, it remains at historically high levels, and crowded conditions have persisted, straining the aging system. While new Fleet of the Future cars began to roll out in

[5] The 7/09 fare increase of 6.1% does not include the minimum fare increase (+$0.25) or the SFO premium fare increase (+$2.50).

January 2018, there was only one new train in revenue service at the time of the survey, so crowding relief had yet to be realized. Additionally, the quality of life issues that have greatly impacted the Bay Area in the past few years, specifically those stemming from increased homelessness, the opioid crisis, and untreated mental illness, have also impacted BART. Many comments from riders regarding cleanliness and perceptions of personal security are related to these issues.

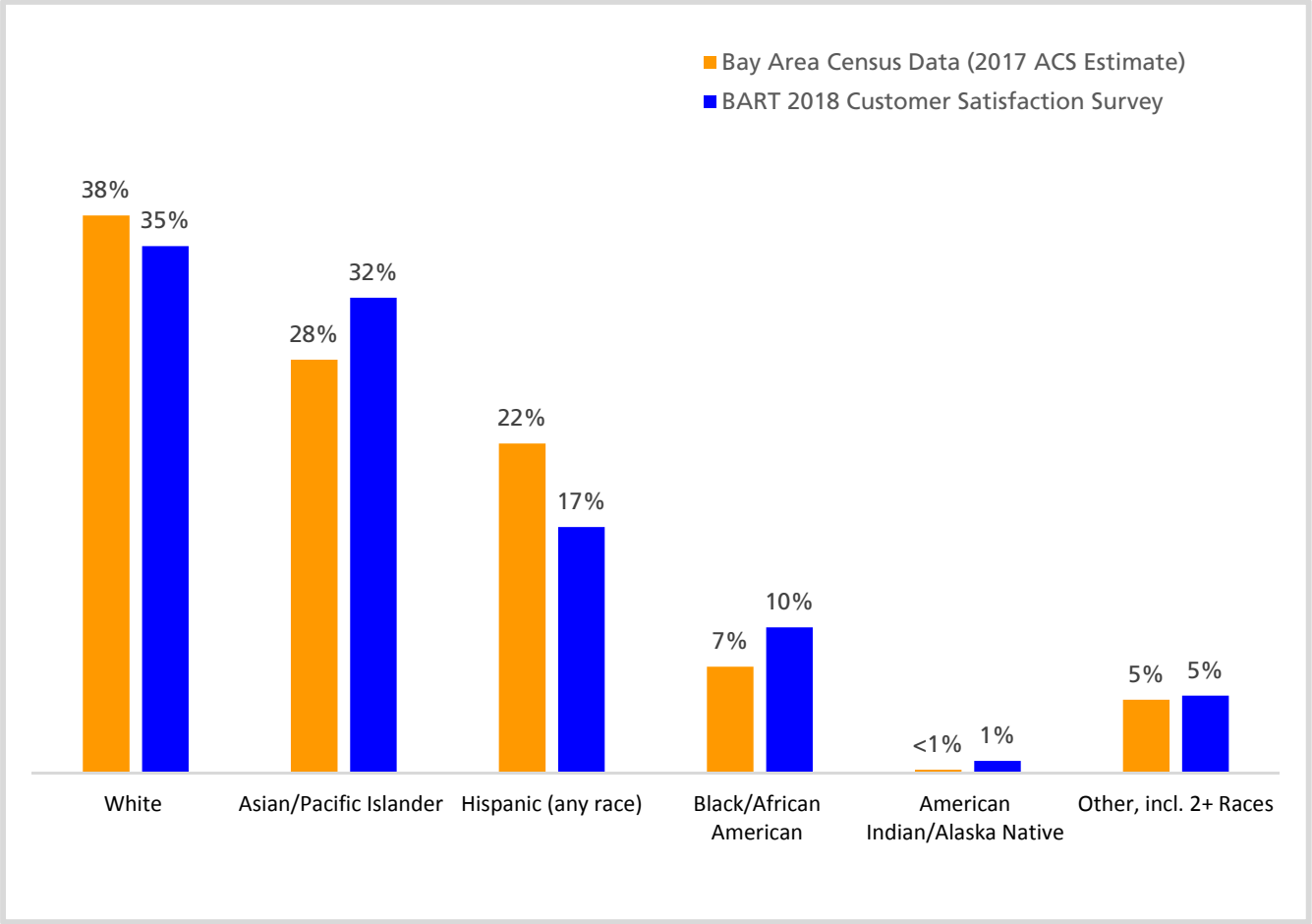
Going forward, funding from Measure RR (approved by voters in November 2016) will help to rebuild BART, with a focus on repairing and replacing critical safety infrastructure. (For details about Measure RR projects, refer to the annual reports available at bart.gov/reports.) Other efforts underway to improve the customer experience include an increased focus on quality of life issues, including funding to hire 19 additional police officers, as well as to expand Homeless Outreach Teams to cover all four counties in BART's service area. Also expected to improve customer satisfaction is the steady roll out of new Fleet of the Future cars. As of summer 2019, six new trains are in revenue service.



**Average fare increases were as follows: 4/95: 15%; 4/96: 13%; 4/97: 11.4%; 1/03: 5%; 1/04: 10%; 1/06: 3.7%; 1/08: 5.4%; 7/09: 6.1%; 7/12: 1.4%; 1/14: 5.2%; 1/16: 3.4%; 1/18: 2.7%. The 2006 fare increase of 3.7% doesn't include an additional $0.10 capital surcharge. The 2009 fare increase of 6.1% doesn't include the minimum fare increase (+$0.25) or the SFO premium fare increase (+$2.50). The 2018 fare increase doesn't include the 50 cent charge per trip for BART blue tickets.*

BART CUSTOMER ETHNICITY COMPARED TO REGIONAL DATA

BART customers' ethnicities generally reflect the diversity of the Bay Area; however, the proportion of riders who are Asian or African American is slightly higher than their proportions of the BART service area population, while the reverse is true for Hispanic ridership.

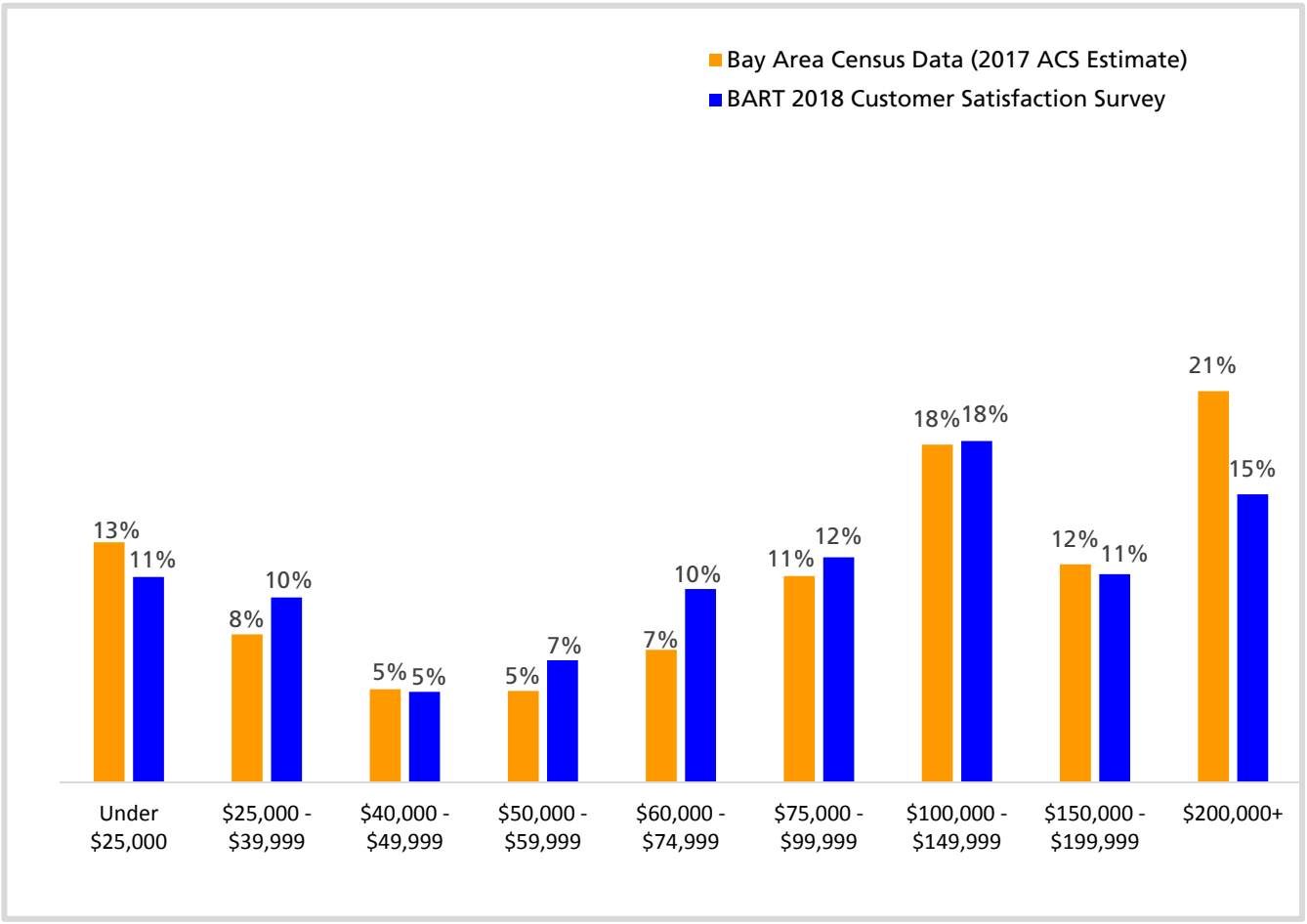


Sources:
- U.S. Census Bureau, 2017 American Community Survey 1-Year Estimates: Table C03002 "Hispanic or Latino Origin by Race." Universe: Total Population. (factfinder.census.gov)
- BART 2018 Customer Satisfaction Survey

Notes:
1) The ACS 2017 estimates shown only include data for the four counties within BART's service area: Alameda, Contra Costa, San Francisco, and San Mateo. Census tables adjust for unit non-response by weighting at the tract-level.
2) The categories shown in this chart classify respondents based on single vs. two-plus race and Hispanic vs. non-Hispanic. The categories "White," "Black/African American," "Asian/Pacific Islander," and "American Indian/Alaska Native" only include respondents who reported a single race and are non-Hispanic. All two-plus race, non-Hispanic responses are included within "Other." All Hispanic responses are included within Hispanic, regardless of race. Note that ethnicity data are categorized differently in other charts within this report, so the percentages shown will differ.
3) The BART data distribution is based on 5,114 responses and excludes 3% non-response.
4) Totals may not add to 100% due to rounding.

BART CUSTOMER INCOMES COMPARED TO REGIONAL DATA

BART customers' household incomes approximately track regional household income distribution; however, there is a notable difference at the highest income level.



Sources:

- U.S. Census Bureau, 2017 American Community Survey 1-Year Estimates: B19001 "Household Income in the Past 12 Months." Universe: Households. (factfinder.census.gov)
- BART 2018 Customer Satisfaction Survey

Notes:

1) The ACS 2017 estimates shown only include data for the four counties within BART's service area: Alameda, Contra Costa, San Francisco, and San Mateo. Census tables adjust for unit non-response by weighting at the tract-level.
2) The BART data distribution is based on 4,686 responses and excludes 11% non-response. Note that other tables within this report include non-response, so the percentages shown will differ.
3) Totals may not add to 100% due to rounding.

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Appendix A: QUESTIONNAIRE

Questionnaires in:
English
Spanish
Chinese

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Survey & Contest

Please complete this survey and **hand it back to the survey coordinator.** If necessary, you can also mail the survey to: BART Marketing & Research, P.O. Box 12688, Oakland, CA 94604-2688.

Grand Prize: Win an iPad! Enter on back for a chance to win an iPad or one of four $100 Clipper cards.

USAGE OF BART

1 Which BART station did you enter before boarding this train?

_____ (Entry Station)

2 About what time did you get on this train?

_____ (Hour) _____ (Minute) 1☐ AM 2☐ PM

3 At which BART station will you exit the system?

_____ (Exit Station)

4 Are you transferring between BART trains on this trip?

1☐ No 2☐ Yes

5 What is the **primary** purpose of this trip? *(Check only one)*

1☐ Commute to / from work
2☐ School
3☐ Airplane trip
4☐ Sports event
5☐ Visit friends / family
6☐ Medical / dental
7☐ Shopping
8☐ Restaurant
9☐ Theater or concert
10☐ Other: _____

6 How did you travel between home and BART today?

1☐ Walked all the way to BART
2☐ Bicycled
3☐ Bus / transit
4☐ Drove alone
5☐ Carpooled
6☐ Dropped off
7☐ Uber, Lyft, etc.
8☐ Taxi
9☐ Other: _____

Where did you **park**?
1☐ BART parking 2☐ Other parking

What fee, if any, did you **pay** to park?
1☐ None / free 3☐ Single day reserved
2☐ Daily fee 4☐ Monthly permit

7 Did you use a **Clipper** card to pay for this BART trip?

1☐ No 2☐ Yes

8 What **type of fare** did you pay for this BART trip? *(Check one)*

1☐ Regular BART fare
2☐ High Value Discount ($48 or $64 value)
3☐ Muni Fast Pass
4☐ Senior discount
5☐ Disabled discount
6☐ Youth discount
7☐ Other discount: _____

9 After you boarded the train for this trip, did you **stand because seating was unavailable**?

1☐ No
2☐ Yes – whole trip
3☐ Yes – part of trip

10 How long have you been riding BART?

1☐ This is my first time on BART
2☐ 6 months or less
3☐ More than 6 months but less than 1 year
4☐ 1 – 2 years
5☐ 3 – 5 years
6☐ More than 5 years

11 How often do you **currently** ride BART? *(Check one)*

1☐ 6 – 7 days a week
2☐ 5 days a week
3☐ 3 – 4 days a week
4☐ 1 – 2 days a week
5☐ 1 – 3 days a **month**
6☐ Less than once a **month** → About how many times a year? _____

OPINION OF BART

12 Overall, how satisfied are you with the services provided by BART?

5☐ Very Satisfied
4☐ Somewhat Satisfied
3☐ Neutral
2☐ Somewhat Dissatisfied
1☐ Very Dissatisfied

13 Would you recommend using BART to a friend or out-of-town guest?

5☐ Definitely
4☐ Probably
3☐ Might or might not
2☐ Probably not
1☐ Definitely not

14 To what extent do you agree with the following statement: "BART is a good value for the money."

5☐ Agree Strongly
4☐ Agree Somewhat
3☐ Neutral
2☐ Disagree Somewhat
1☐ Disagree Strongly

ABOUT YOURSELF

15 Gender: 1☐ Male 2☐ Female 3☐ _____

16 Age:

1☐ 12 or younger
2☐ 13 - 17
3☐ 18 - 24
4☐ 25 - 34
5☐ 35 - 44
6☐ 45 - 54
7☐ 55 - 64
8☐ 65 and older

17 Do you have a car or motorcycle?

1☐ No 2☐ Yes

18 Do you have a smart phone (can access Internet, use apps)?

1☐ No 2☐ Yes

19 What is your race or ethnic identification? *(Check all that apply)*

1☐ American Indian or Alaska Native
2☐ Asian or Pacific Islander
3☐ Black / African American
4☐ Hispanic, Latino or Spanish origin
5☐ White
6☐ Other: _____

(Categories are based on the U.S. Census)

20a Do you speak a language other than English at home?

1☐ No
2☐ Yes, I speak: _____

20b If "Yes" to question 20a, how well do you speak English?

1☐ Very well 2☐ Well 3☐ Not well 4☐ Not at all

21 What is your total annual household income before taxes?

1☐ Under $25,000
2☐ $25,000 - $34,999
3☐ $35,000 - $39,999
4☐ $40,000 - $49,999
5☐ $50,000 - $59,999
6☐ $60,000 - $74,999
7☐ $75,000 - $99,999
8☐ $100,000 - $149,999
9☐ $150,000 - $199,999
10☐ $200,000 and over

22 Including yourself, how many people live in your household?

1☐ 1 2☐ 2 3☐ 3 4☐ 4 5☐ 5 6☐ 6+

23 What is your home ZIP code? ☐☐☐☐☐

☐ Live outside U.S.

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OVER

24 Please help BART improve service by rating each of the following attributes. "7" (excellent) is the highest rating, and "1" (poor) is the lowest rating. You also can use any number in between. Skip attributes that do not apply to you.

OVERALL BART RATING	Poor						Excellent
On-time performance of trains	1	2	3	4	5	6	7
Hours of operation	1	2	3	4	5	6	7
Frequency of train service	1	2	3	4	5	6	7
Availability of maps and schedules	1	2	3	4	5	6	7
bart.gov website	1	2	3	4	5	6	7
Timely information about service disruptions	1	2	3	4	5	6	7
Timeliness of connections between BART trains	1	2	3	4	5	6	7
Timeliness of connections with other transit	1	2	3	4	5	6	7
Availability of car parking	1	2	3	4	5	6	7
Availability of bicycle parking	1	2	3	4	5	6	7
Lighting in parking lots	1	2	3	4	5	6	7
Access for people with disabilities	1	2	3	4	5	6	7
Personal security in the BART system	1	2	3	4	5	6	7
Enforcement against fare evasion	1	2	3	4	5	6	7
Enforcement of no eating and drinking policy	1	2	3	4	5	6	7
BART system kept free of graffiti	1	2	3	4	5	6	7
Addressing homelessness on the BART system	1	2	3	4	5	6	7

BART STATION RATING	Poor						Excellent
Length of lines at exit gates	1	2	3	4	5	6	7
Reliability of ticket vending machines	1	2	3	4	5	6	7
Reliability of faregates	1	2	3	4	5	6	7
Clipper cards	1	2	3	4	5	6	7
BART tickets	1	2	3	4	5	6	7
Escalator availability and reliability	1	2	3	4	5	6	7
Elevator availability and reliability	1	2	3	4	5	6	7
Presence of BART Police in stations	1	2	3	4	5	6	7
Presence of BART Police outside stations	1	2	3	4	5	6	7
Availability of Station Agents	1	2	3	4	5	6	7
Helpfulness and courtesy of Station Agents	1	2	3	4	5	6	7
Station cleanliness	1	2	3	4	5	6	7
Restroom cleanliness	1	2	3	4	5	6	7
Elevator cleanliness	1	2	3	4	5	6	7
Signs with transfer / platform / exit directions	1	2	3	4	5	6	7
Overall condition / state of repair	1	2	3	4	5	6	7

BART TRAIN RATING	Poor						Excellent
Availability of seats on trains	1	2	3	4	5	6	7
Availability of space on trains for luggage, bicycles, and strollers	1	2	3	4	5	6	7
Availability of standing room on trains	1	2	3	4	5	6	7
Comfort of seats on trains	1	2	3	4	5	6	7
Condition / cleanliness of seats on trains	1	2	3	4	5	6	7
Comfortable temperature aboard trains	1	2	3	4	5	6	7
Noise level on trains	1	2	3	4	5	6	7
Clarity of public address announcements	1	2	3	4	5	6	7
Presence of BART Police on trains	1	2	3	4	5	6	7
Appearance of train exterior	1	2	3	4	5	6	7
Condition / cleanliness of windows on trains	1	2	3	4	5	6	7
Train interior cleanliness	1	2	3	4	5	6	7
Condition / cleanliness of floors on trains	1	2	3	4	5	6	7

COMMENTS: (Give additional feedback at www.bart.gov/comments)

_____

_____

_____

CONTEST ENTRY:

Name:_____ Email address:_____ Phone number:_____

May we contact you in the future to ask your **opinion about BART**? ☐ Yes ☐ No

Would you like to sign up for **BARTable this Week**, a free email newsletter with contests, discounts and events close to BART stations? ☐ Yes ☐ No

Would you like to be contacted in the future with **important BART updates** (no more than once per year), or in case of a major system-wide emergency? ☐ Yes ☐ No

CONTEST RULES: No purchase necessary. Void where prohibited. You may enter more than once. This sweepstakes ends on 10/24/18 at 5 PM PDT. Sponsor is Bay Area Rapid Transit (BART). Open only to residents of California who are at least 18 years old at time of entry. Employees/contractors of BART and their family/household members are not eligible to enter. Other restrictions apply. Sponsor will award one iPad (approximate value $329) and four Clipper cards (approximate value $100 each). Aggregate prize value: $729. Winners will be chosen by random drawing. Need not be present to win. All federal, state and local regulations apply. For Official Rules, go to www.bart.gov/survey.

OVER

Encuesta y concurso

Sírvase contestar esta encuesta y **devuélvala al coordinador de la encuesta.** De ser necesario, también puede enviar la encuesta por correo a: BART Marketing & Research, P.O. Box 12688, Oakland, CA 94604-2688.

Gran premio: ¡Gánese un iPad! Participe al reverso para ganar un iPad o una de cuatro tarjetas Clipper de $100.

USO DE BART

1 ¿En qué estación de BART entró antes de subir a este tren?

_____
(Estación de entrada)

2 ¿Aproximadamente a qué hora subió a este tren?

_____ : _____ 1☐ AM 2☐ PM
(Hora) (Minuto)

3 ¿En qué estación de BART saldrá del sistema?

_____
(Estación de salida)

4 ¿Va a hacer una trasbordo entre trenes de BART en este viaje?

1☐ No 2☐ Sí

5 ¿Cuál es el propósito **principal** de este recorrido?
(Marque sólo una respuesta)

1☐ Pasajero habitual al / del trabajo
2☐ Escuela
3☐ Viaje en avión
4☐ Evento deportivo
5☐ Visitar amigos / familia
6☐ Servicio médico / dental
7☐ Compras
8☐ Restaurante
9☐ Teatro o concierto
10☐ Otro: _____

6 ¿Cómo se trasladó de su casa a BART el día de hoy?

1☐ Caminé todo el trayecto hasta BART
2☐ En bicicleta
3☐ Autobús / transporte público
4☐ Conduje solo(a)
5☐ Viaje compartido en auto
6☐ Alguien me llevó
7☐ Uber, Lyft, etc.
8☐ Taxi
9☐ Otro: _____

→ ¿En dónde se **estacionó**?
1☐ Estacionamiento de BART 2☐ Otro estacionamiento

→ ¿Qué tarifa, en su caso, tuvo que **pagar** para estacionarse?
1☐ Ninguna / gratis 3☐ Reservación por día sencillo
2☐ Tarifa diaria 4☐ Permiso mensual

7 ¿Utilizó usted una tarjeta **Clipper** para pagar este recorrido en BART?

1☐ No 2☐ Sí

8 ¿Qué **tipo de tarifa** pagó usted en este recorrido en BART?
(Marque una respuesta)

1☐ Tarifa normal de BART
2☐ Descuento de alto valor (valor de $48 o $64)
3☐ Muni Fast Pass
4☐ Descuento para personas mayores
5☐ Descuento para discapacitados
6☐ Descuento para jóvenes
7☐ Otro descuento: _____

9 Después de que abordó el tren en este recorrido, ¿tuvo usted que **viajar de pie debido a que no había asientos disponibles**?

1☐ No
2☐ Sí, todo el viaje
3☐ Sí, parte del viaje

10 ¿Cuánto tiempo lleva viajando con BART?

1☐ Este es mi primer viaje con BART
2☐ 6 meses o menos
3☐ Más de 6 meses, pero menos de 1 año
4☐ 1 a 2 años
5☐ 3 a 5 años
6☐ Más de 5 años

11 ¿Con qué frecuencia viaja usted en BART **actualmente**?
(Marque una respuesta)

1☐ 6 a 7 días a la semana
2☐ 5 días a la semana
3☐ 3 a 4 días a la semana
4☐ 1 a 2 días a la semana
5☐ 1 a 3 días al **mes**
6☐ Menos de una vez al **mes** → ¿Aproximadamente cuántas veces al año?_____

♻ Impreso en papel reciclado, 30% de desechos post-consumidor. 8/2018

OPINIÓN SOBRE BART

12 En general, ¿cuál es su grado de satisfacción con los servicios que ofrece BART?

5☐ Muy satisfecho(a)
4☐ Algo satisfecho(a)
3☐ Neutral
2☐ Algo insatisfecho(a)
1☐ Muy insatisfecho(a)

13 ¿Recomendaría el uso de BART a un amigo o huésped de fuera de la ciudad?

5☐ Por supuesto que sí
4☐ Probablemente
3☐ Tal vez
2☐ Probablemente no
1☐ Por supuesto que no

14 ¿Hasta qué punto está de acuerdo con la siguiente afirmación? "BART le brinda un buen servicio por su dinero".

5☐ Totalmente de acuerdo
4☐ Algo de acuerdo
3☐ Neutral
2☐ Algo en desacuerdo
1☐ Totalmente en desacuerdo

ACERCA DE USTED

15 Sexo: 1☐ Masculino 2☐ Femenino 3☐ _____

16 Edad:
1☐ 12 años o menos
2☐ 13 a 17
3☐ 18 a 24
4☐ 25 a 34
5☐ 35 a 44
6☐ 45 a 54
7☐ 55 a 64
8☐ 65 o más

17 ¿Tiene un automóvil o una motocicleta?

1☐ No 2☐ Sí

18 ¿Tiene un teléfono inteligente (puede acceder a Internet, usar aplicaciones)?

1☐ No 2☐ Sí

19 ¿Cuál es su raza o identificación étnica?
(Marque todas las opciones que correspondan)

1☐ Indígena norteamericano o nativo de Alaska
2☐ Asiático o de las Islas del Pacífico
3☐ Negro / afroamericano
4☐ Hispano, latino o de origen español
5☐ Blanco
6☐ Otro:_____
(Categorías según el Censo de los Estados Unidos)

20a ¿Habla usted un idioma que no sea el inglés en el hogar?

1☐ No
2☐ Sí, hablo:_____

20b Si respondió "Sí" a la pregunta 20a, ¿qué tan bien habla inglés?

1☐ Muy bien 2☐ Bien 3☐ Mal 4☐ Nada

21 ¿Cuáles son los ingresos totales anuales de su hogar antes de impuestos?

1☐ Menos de $25,000
2☐ $25,000 a $34,999
3☐ $35,000 a $39,999
4☐ $40,000 a $49,999
5☐ $50,000 a $59,999
6☐ $60,000 a $74,999
7☐ $75,000 a $99,999
8☐ $100,000 a $149,999
9☐ $150,000 a $199,999
10☐ $200,000 o más

22 Incluyéndose usted, ¿cuántas personas viven en su hogar?

1☐ 1 2☐ 2 3☐ 3 4☐ 4 5☐ 5 6☐ 6 o más

23 ¿Cuál es el código postal de su hogar? ☐☐☐☐☐

☐ Vivo fuera de los EE. UU.

CONTINÚA EN EL REVERSO ➔

24 Le agradeceremos que ayude a BART a mejorar su servicio calificando cada uno de los siguientes atributos. "7" (excelente) es la calificación más alta, y "1" (malo) es la calificación más baja. También puede usar cualquier número intermedio. Omita los atributos que no se apliquen a usted.

CALIFICACIÓN GENERAL DE BART	Malo						Excelente
Puntualidad de los trenes	1	2	3	4	5	6	7
Horario de operación	1	2	3	4	5	6	7
Frecuencia del servicio de trenes	1	2	3	4	5	6	7
Disponibilidad de mapas y horarios	1	2	3	4	5	6	7
Sitio web bart.gov	1	2	3	4	5	6	7
Información oportuna sobre interrupciones del servicio	1	2	3	4	5	6	7
Puntualidad de las conexiones entre los trenes de BART	1	2	3	4	5	6	7
Puntualidad de las conexiones con otros medios de transporte público	1	2	3	4	5	6	7
Disponibilidad de estacionamiento para autos	1	2	3	4	5	6	7
Disponibilidad de estacionamiento para bicicletas	1	2	3	4	5	6	7
Iluminación en los estacionamientos	1	2	3	4	5	6	7
Acceso para personas con discapacidades	1	2	3	4	5	6	7
Seguridad personal en el sistema BART	1	2	3	4	5	6	7
Medidas para combatir la evasión de tarifas	1	2	3	4	5	6	7
Aplicación de la norma de no comer ni beber	1	2	3	4	5	6	7
El sistema BART se mantiene libre de graffiti	1	2	3	4	5	6	7
Respuestas del sistema BART en cuanto a las personas sin hogar	1	2	3	4	5	6	7

CALIFICACIÓN DE LAS ESTACIONES DE BART	Malo						Excelente
Longitud de las filas en las puertas de salida	1	2	3	4	5	6	7
Confiabilidad de las máquinas expendedoras de boletos	1	2	3	4	5	6	7
Confiabilidad de las puertas de tarifas	1	2	3	4	5	6	7
Tarjetas Clipper	1	2	3	4	5	6	7
Boletos de BART	1	2	3	4	5	6	7
Disponibilidad y fiabilidad de las escaleras mecánicas	1	2	3	4	5	6	7
Disponibilidad y fiabilidad de los elevadores	1	2	3	4	5	6	7
Presencia de la Policía de BART en las estaciones	1	2	3	4	5	6	7
Presencia de la Policía de BART fuera de las estaciones	1	2	3	4	5	6	7
Disponibilidad de los agentes de la estación	1	2	3	4	5	6	7
Ayuda y cortesía de los agentes de la estación	1	2	3	4	5	6	7
Limpieza de las estaciones	1	2	3	4	5	6	7
Limpieza de los baños	1	2	3	4	5	6	7
Limpieza de los elevadores	1	2	3	4	5	6	7
Letreros con direcciones de trasbordo / plataforma / salida	1	2	3	4	5	6	7
Estado general / estado de reparación	1	2	3	4	5	6	7

CALIFICACIÓN DE LOS TRENES DE BART	Malo						Excelente
Disponibilidad de asientos en los trenes	1	2	3	4	5	6	7
Disponibilidad de espacio en los trenes para equipaje, bicicletas y cochecitos de bebé	1	2	3	4	5	6	7
Disponibilidad de espacio para ir de pie en los trenes	1	2	3	4	5	6	7
Comodidad de los asientos en los trenes	1	2	3	4	5	6	7
Condición / limpieza de los asientos en los trenes	1	2	3	4	5	6	7
Temperatura agradable dentro del tren	1	2	3	4	5	6	7
Nivel de ruido en los trenes	1	2	3	4	5	6	7
Claridad de los anuncios dirigidos al público	1	2	3	4	5	6	7
Presencia de la Policía de BART en los trenes	1	2	3	4	5	6	7
Aspecto del exterior de los trenes	1	2	3	4	5	6	7
Condición / limpieza de las ventanas en los trenes	1	2	3	4	5	6	7
Limpieza del interior de los trenes	1	2	3	4	5	6	7
Condición / limpieza de los pisos en los trenes	1	2	3	4	5	6	7

COMENTARIOS: (Puede hacer comentarios adicionales en www.bart.gov/comments.)

_____

_____

_____

PARTICIPACIÓN EN EL CONCURSO:

Nombre:_____ Dirección de email:_____ Número de teléfono:_____

¿Podemos comunicarnos con usted más adelante para pedirle sus **opiniones sobre BART**? ☐Sí ☐No

¿Desea suscribirse para recibir **BARTable this Week**, un boletín gratuito que se envía por email e incluye concursos, descuentos e información sobre eventos cercanos a las estaciones de BART? ☐Sí ☐No

¿Le gustaría que nos comunicáramos con usted en el futuro sobre **actualizaciones importantes de BART** (no más de una vez al año), o en el caso de que ocurra una grave emergencia de todo el sistema? ☐Sí ☐No

REGLAS DEL CONCURSO: No es necesario efectuar compra alguna. Nulo cuando lo prohíba la ley. Puede participar más de una vez. Este sorteo finaliza el 24/oct/18 a las 5 p.m. PDT. Patrocinado por Bay Area Rapid Transit (BART). Abierto únicamente a residentes de California que tengan al menos 18 años de edad al momento de solicitar la participación. Los empleados/contratistas de BART y sus familiares o miembros de su hogar no reúnen los requisitos de participación. Se aplican otras restricciones. El patrocinador otorgará un iPad (valor aproximado de $329) y cuatro tarjetas Clipper (valor aproximado de $100 cada una). Valor agregado de los premios: $729. Los ganadores serán elegidos mediante un sorteo al azar. No es necesario estar presente para ganar. Se aplican todas las leyes y reglamentos locales, estatales y federales. Para conocer las reglas oficiales, visite www.bart.gov/survey.

CONTINÚA EN EL REVERSO

問卷調查與抽獎報名

請將問卷填妥並**交回給調查員**。如有需要，您亦可將問卷寄到：BART Marketing & Research, P.O. Box 12688, Oakland, CA 94604-2688。

頭獎：贏得一台 iPad！在背面報名抽獎，就有機會贏得一台 iPad (一名) 或一張價值 $100 的 Clipper 卡 (四名)。

BART 使用情況

1 在搭上這班列車前，您從哪個 BART 捷運站進站？

_____ (進站的站名)

2 您大概是什麼時候搭上這班列車的？

_____ (時) : _____ (分)　1☐ 上午　2☐ 下午

3 您今天要在哪個 BART 捷運站出站？

_____ (出站的站名)

4 您這次搭車是否要在 BART 列車之間轉車？

1☐ 否　2☐ 是

5 您這次搭車的**主要**目的是什麼？*(限勾選一項)*

1☐ 上下班通勤
2☐ 上下學
3☐ 去機場
4☐ 體育賽事
5☐ 拜訪親友
6☐ 看醫生
7☐ 購物
8☐ 餐廳
9☐ 劇場或演唱會
10☐ 其他：_____

6 您今天怎麼從家裡往返 BART 捷運站？

1☐ 全程走路到 BART 捷運站
2☐ 騎自行車
3☐ 搭公車 / 公共交通工具
4☐ 單獨開車
5☐ 共乘
6☐ 有人送到站
7☐ Uber、Lyft 等等
8☐ 搭計程車
9☐ 其他：_____

→ 您把車子**停放**在哪裡？ 1☐ BART 停車場 2☐ 其他停車場

→ 您**支付**哪一種停車費？ 1☐ 無 / 免費 2☐ 日租費 (Daily fee) 3☐ 單日保留 (Single day reserved) 4☐ 月租許可證 (Monthly permit)

7 您是否使用了 **Clipper** 卡支付 BART 車資？

1☐ 否　2☐ 是

8 您這次搭乘 BART 支付**哪一種車資**？*(勾選一項)*

1☐ 常規 BART 車資
2☐ 高價值 (High Value) 折扣 (價值 $48 或 $64)
3☐ Muni Fast Pass
4☐ 老人折扣
5☐ 殘障人士折扣
6☐ 青少年折扣
7☐ 其他折扣：_____

9 您上車後的這段路程，是否**因為沒有座位而要站著**？

1☐ 否
2☐ 是 – 全程
3☐ 是 – 部分路程

10 您搭乘 BART 有多長時間了？

1☐ 這是我第一次搭乘 BART
2☐ 6 個月或更短
3☐ 超過 6 個月但不到 1 年
4☐ 1 – 2 年
5☐ 3 – 5 年
6☐ 5 年以上

11 您**目前**多常搭乘 BART ？*(勾選一項)*

1☐ 一星期 6 – 7 天
2☐ 一星期 5 天
3☐ 一星期 3 – 4 天
4☐ 一星期 1 – 2 天
5☐ 一個**月** 1 – 3 天
6☐ 一個**月**不到一次 → 一年大約幾次？_____

對 BART 的意見

12 整體而言，您對 BART 服務的滿意程度如何？

5☐ 非常滿意
4☐ 有點滿意
3☐ 沒意見
2☐ 有點不滿意
1☐ 非常不滿意

13 您會建議朋友或外地訪客搭乘 BART 嗎？

5☐ 肯定會
4☐ 可能會
3☐ 不確定
2☐ 可能不會
1☐ 肯定不會

14 您對以下敘述的同意程度如何：「搭乘 BART 很划算。」

5☐ 非常同意
4☐ 有點同意
3☐ 沒意見
2☐ 有點不同意
1☐ 非常不同意

關於您自己

15 性別：1☐ 男　2☐ 女　3☐_____

16 年齡：

1☐ 12 歲或以下
2☐ 13 - 17 歲
3☐ 18 - 24 歲
4☐ 25 - 34 歲
5☐ 35 - 44 歲
6☐ 45 - 54 歲
7☐ 55 - 64 歲
8☐ 65 歲和以上

17 您有汽車或摩托車嗎？

1☐ 沒有　2☐ 有

18 您有智慧型手機嗎 (可上網或使用應用程式) ？

1☐ 沒有　2☐ 有

19 您認為自己屬於什麼種族或族裔？*(請勾選所有適用選項)*

1☐ 美國印地安人或阿拉斯加原住民
2☐ 亞裔或太平洋島民
3☐ 黑人 / 非裔美國人
4☐ 西語裔、拉丁裔或西班牙血統
5☐ 白人
6☐ 其他：_____

(類別以美國人口普查為依據)

20a 您在家是否說英語以外的語言？

1☐ 否
2☐ 是，我說：_____

20b 若問題 20a 回答「是」，您的英語說得怎麼樣？

1☐ 非常好　2☐ 好　3☐ 不好　4☐ 完全不會說

21 您的稅前家庭總年收入是多少？

1☐ 不到 $25,000
2☐ $25,000 - $34,999
3☐ $35,000 - $39,999
4☐ $40,000 - $49,999
5☐ $50,000 - $59,999
6☐ $60,000 - $74,999
7☐ $75,000 - $99,999
8☐ $100,000 - $149,999
9☐ $150,000 - $199,999
10☐ $200,000 和以上

22 包括您在內，家裡總共住了多少人？

1☐ 1　2☐ 2　3☐ 3　4☐ 4　5☐ 5　6☐ 6+

23 您住家的郵遞區號是多少？ ☐☐☐☐☐

☐ 我不住美國

使用 30% 用後再生紙印刷。8/2018

請翻面

24 請對以下每個屬性評分，幫助 BART 改善服務品質。最高分是「7」(極佳)，最低分是「1」(差)。
您也可以選擇中間的任何數字。請跳過對您不適用的屬性。

BART 整體評分	差						極佳
列車準時率	1	2	3	4	5	6	7
營運時間	1	2	3	4	5	6	7
列車班次頻率	1	2	3	4	5	6	7
可找到地圖和時刻表	1	2	3	4	5	6	7
bart.gov 網站	1	2	3	4	5	6	7
及時提供服務中斷資訊	1	2	3	4	5	6	7
BART 列車之間接駁的及時性	1	2	3	4	5	6	7
與其他公共交通服務接駁的及時性	1	2	3	4	5	6	7
汽車停車位數量	1	2	3	4	5	6	7
自行車停車位數量	1	2	3	4	5	6	7
停車場照明	1	2	3	4	5	6	7
殘障人士無障礙設施	1	2	3	4	5	6	7
BART 系統內的個人保安措施	1	2	3	4	5	6	7
嚴抓逃票	1	2	3	4	5	6	7
強制執行禁止飲食政策	1	2	3	4	5	6	7
保持 BART 系統無塗鴉情形	1	2	3	4	5	6	7
處理 BART 系統內的遊民問題	1	2	3	4	5	6	7
BART 車站評分	差						極佳
出站閘門的隊伍長度	1	2	3	4	5	6	7
售票機的可靠性	1	2	3	4	5	6	7
驗票閘門的可靠性	1	2	3	4	5	6	7
Clipper 卡	1	2	3	4	5	6	7
BART 車票	1	2	3	4	5	6	7
電扶梯數量和可靠性	1	2	3	4	5	6	7
電梯數量和可靠性	1	2	3	4	5	6	7
站內有捷運警察值勤	1	2	3	4	5	6	7
站外有捷運警察值勤	1	2	3	4	5	6	7
可提供協助的站務員人數	1	2	3	4	5	6	7
站務員的幫助和禮貌程度	1	2	3	4	5	6	7
車站清潔程度	1	2	3	4	5	6	7
洗手間清潔程度	1	2	3	4	5	6	7
電梯清潔程度	1	2	3	4	5	6	7
轉車 / 月台 / 出口方向標誌	1	2	3	4	5	6	7
整體狀況 / 維護情形	1	2	3	4	5	6	7
BART 列車評分	差						極佳
車上座位數量	1	2	3	4	5	6	7
車上行李、自行車和嬰兒車的放置空間大小	1	2	3	4	5	6	7
車上站位的空間大小	1	2	3	4	5	6	7
車上座位的舒適度	1	2	3	4	5	6	7
車上座位的狀況 / 清潔程度	1	2	3	4	5	6	7
車上溫度的舒適度	1	2	3	4	5	6	7
車上噪音的音量	1	2	3	4	5	6	7
車上廣播的清晰度	1	2	3	4	5	6	7
車上有捷運警察值勤	1	2	3	4	5	6	7
列車外觀	1	2	3	4	5	6	7
車窗的狀況 / 清潔程度	1	2	3	4	5	6	7
車廂內部的清潔程度	1	2	3	4	5	6	7
列車地板的狀況 / 清潔程度	1	2	3	4	5	6	7

意見： (您可上網站 www.bart.gov/comments 提供更多回應意見。)

_____

_____

_____

抽獎報名：
姓名：_____ 電郵地址：_____ 電話號碼：_____

我們將來是否可以與您聯絡，徵求**關於 BART 的意見**？ ☐ 是 ☐ 否
您是否要訂閱免費電子報 **BARTable this Week**，並且收到有關抽獎、折扣和 BART 捷運站附近的活動資訊？ ☐ 是 ☐ 否
如將來有**關於 BART 的重要消息**(每年不超過一次)，或整個系統發生重大緊急事故，您是否希望 BART 與您聯絡？ ☐ 是 ☐ 否

抽獎規則：無需購買即可參加抽獎。若法律禁止則無效。您可多次報名抽獎。本抽獎活動截止日期：2018 年 10 月 24 日，下午 5 時整(太平洋時間)。主辦方為舊金山灣區捷運處 (BART)。僅開放給報名時已年滿 18 歲的加州居民參加。BART 員工 / 承包商及其家人 / 家庭成員不得參加抽獎。有其他限制。主辦方將送出一台 iPad (價值約 $329) 和四張 Clipper 卡 (每張價值約 $100)。獎品總價值：$729。得獎者將以隨機方式抽出。抽獎時，得獎者無需在場。所有聯邦、州和地方法規皆適用。關於抽獎正式規則，請瀏覽 www.bart.gov/survey。

請翻面

Appendix B:
COMPLETE TABULATIONS

Notes:
Data are weighted, including bases shown in tables, unless otherwise noted.
"No Answer/NA" includes question non-response, unless otherwise indicated.
Columns may not add to 100% due to rounding.

The following symbols are used:
*Less than 1%
- Zero
º Data not available from that year's survey

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TIME BOARDED TRAIN

2. About what time did you get on this train?^

The following time distribution includes both weekday and weekend survey periods.

	Total		
	2014	**2016**	**2018**
Base: (All Respondents)	5,609	5,342	5,294
	(%)	**(%)**	**(%)**
AM			
Before 6 am	2	2	2
6 am – 9 am	21	22	24
9:01 am – 12 noon	13	11	12
PM			
12:01 pm – 4 pm	16	16	16
4:01 pm – 7 pm	34	35	34
After 7 pm	12	12	10
Don't know/No answer	2	2	2
	100	100	100

^ Open-ended responses were categorized into the time periods shown above.

BART STATION ENTERED AND EXITED

1. Which BART station did you enter before boarding this train?
3. At which BART station will you exit the system?

The following table shows BART stations entered by survey participants and BART stations at which they planned to exit (self-reported).

Base: (All Respondents: 5,294)	ENTRY STATION 2018 (%)	EXIT STATION 2018 (%)
EAST BAY	51	50
12th St/Oakland City Center	3	3
19th St/Oakland	4	3
Antioch	1	1
Ashby	1	1
Bay Fair	2	1
Castro Valley	1	*
Coliseum	1	2
Concord	1	1
Downtown Berkeley	3	3
Dublin/Pleasanton	3	2
El Cerrito del Norte	2	2
El Cerrito Plaza	1	1
Fremont	2	3
Fruitvale	2	2
Hayward	2	2
Lafayette	1	1
Lake Merritt	1	2
MacArthur	2	2
North Berkeley	1	2
North Concord/Martinez	*	1
Oakland International Airport^	*	*
Orinda	1	1
Pittsburg Center	*	*
Pittsburg/Bay Point	1	1
Pleasant Hill/Contra Costa Centre	1	1
Richmond	1	1
Rockridge	1	1
San Leandro	1	2
South Hayward	1	1
Union City	2	2
Walnut Creek	1	1
Warm Springs/South Fremont	2	2
West Dublin/Pleasanton	1	1
West Oakland	2	1

*Less than 1%
^ Respondents in the Oakland International Airport category include those who wrote "Oakland Airport" as a response and those who wrote "Coliseum," but indicated they used an airplane to get to BART.

BART STATION ENTERED AND EXITED (continued)

Base: (All Respondents: 5,294)	STATION ENTERED 2018 (%)	STATION EXITED 2018 (%)
El Cerrito (Unspecified)	*	*
Oakland (Unspecified)	*	*
Pittsburg (Unspecified)	*	1
WEST BAY	48	49
16th St Mission	3	2
24th St Mission	2	2
Balboa Park	2	2
Civic Center/UN Plaza	6	5
Colma	1	1
Daly City	3	3
Embarcadero	8	10
Glen Park	1	2
Millbrae	2	2
Montgomery St	9	10
Powell St	7	6
San Bruno	1	1
San Francisco International Airport	1	1
South San Francisco	2	1
San Francisco (Unspecified)	*	*
Airport (Unspecified)	*	*
OTHER/UNDETERMINED	1	2

*Less than 1%

TRANSFER

4. Are you transferring between BART trains on this trip?

- About two out of ten riders transfer between trains on their trip.
- Weekend riders are more likely to transfer than Peak riders.

	Total		
	2014	2016	2018
Base: (All Respondents)	5,609	5,342	5,294
	(%)	(%)	(%)
Yes	20	20	20
No	78	79	79
Don't know/No answer	1	2	1
	100	100	100

	Peak			Off-Peak			Weekend		
	2014	2016	2018	2014	2016	2018	2014	2016	2018
Base: (All Respondents)	2,724	2,712	2,748	2,040	1,951	1,855	845	678	690
	%	%	%	%	%	%	%	%	%
Yes	17	17	17	22	21	23	29	28	24
No	82	82	82	77	77	76	70	70	73
Don't know/No answer	1	1	1	1	2	1	1	2	3
	100	100	100	100	100	100	100	100	100

TRIP PURPOSE (Multi-Year Comparison)

5. What is the primary purpose of this trip?

Overall, greater than two-thirds of BART riders are commuting to or from work. During the weekday peak period, most (81%) are commuting. On weekends, the most common trip purposes are commuting to/from work (23%) and visiting family/friends (23%). (Refer to the next page for trip purpose by time period.)

	Total		
	2014	**2016**	**2018**
Base: (All Respondents)	5,609	5,342	5,294
	(%)	**(%)**	**(%)**
Commute to/from Work	60	65	68
Visit Family/Friends	9	7	7
School	7	6	6
Theater or concert	3	2	3
Airplane trip	3	3	2
Shopping	2	2	2
Sports event	3	2	1
Restaurant	1	1	1
Medical/Dental	2	1	1
Work-related Activity	1	1	1
Tourism/Sightseeing	1	1	1
Personal Business	1	1	1
Public event	1	1	1
Fitness/Recreation	1	*	*
Museum/Art Gallery/ Library	*	*	*
Other	2	2	2
More than one purpose	3	3	3
Don't know/No Answer	1	1	*
	100	100	100

* Less than 1%.

TRIP PURPOSE (By Time Period)

	Peak			Off-Peak			Weekend		
	2014	2016	2018	2014	2016	2018	2014	2016	2018
Base: (All Respondents)	2,724	2,712	2,748	2,040	1,951	1,855	845	678	690
	%	%	%	%	%	%	%	%	%
Commute to/from Work	76	81	81	56	58	66	22	23	23
Visit Family/Friends	4	3	3	9	8	6	24	23	23
School	6	5	5	10	10	8	4	3	3
Theater or concert	1	1	3	3	2	2	9	7	9
Airplane trip	2	2	2	4	3	2	4	5	4
Shopping	1	1	*	2	2	2	9	7	8
Sports event	3	1	1	3	2	1	5	3	7
Restaurant	1	1	1	1	1	1	4	5	4
Medical/Dental	1	1	*	3	2	2	1	1	1
Work-related Activity	1	1	1	1	2	1	1	1	*
Tourism/Sightseeing	*	*	*	1	1	1	1	2	1
Personal Business	*	*	*	1	1	1	1	2	1
Public event	*	*	*	*	-	*	3	3	3
Fitness/Recreation	*	*	*	*	*	*	1	2	1
Museum/Art Gallery/ Library	-	*	*	*	*	*	*	1	1
Other	1	1	1	3	3	3	5	6	5
More than one purpose	2	2	2	3	4	3	6	4	4
Don't know/No answer	*	*	*	1	1	*	1	1	1
	100	100	100	100	100	100	100	100	100

* Less than 1%
- Zero

HOW TRAVELED BETWEEN HOME AND BART

6. How did you travel between home and BART today?

- 43% use a private vehicle to travel from home to BART (drive alone, get dropped off, or carpool).
- Nearly one-third of riders walk to BART.
- Peak riders are more likely to drive alone to BART than riders in other time periods.
- Weekend riders are more likely to carpool or take a TNC (Uber, Lyft, etc.) to BART.

	Total		
	2014	2016	2018
Base: (All Respondents)	5,609	5,342	5,294
	(%)	(%)	(%)
Walked all the way to BART	33	33	31
Drove alone	28	29	29
Bus / transit	14	14	13
Dropped off	10	9	9
Carpooled	6	5	6
Bicycled	5	5	5
Uber, Lyft, etc.^	*	3	4
Taxi^	*	*	*
Other / Combo / NA	3	3	3
	100	100	100

	Peak			Off-Peak			Weekend		
	2014	2016	2018	2014	2016	2018	2014	2016	2018
Base: (All Respondents)	2,724	2,712	2,748	2,040	1,951	1,855	845	678	690
	%	%	%	%	%	%	%	%	%
Walked all the way to BART	29	32	29	35	34	33	37	36	34
Drove alone	33	33	34	24	26	26	18	19	17
Bus / transit	13	13	12	16	15	14	14	14	15
Dropped off	10	9	9	10	9	9	11	8	8
Carpooled	6	5	6	5	4	3	10	9	11
Bicycled	5	5	5	6	5	6	5	5	4
Uber, Lyft, etc.^	*	2	3	*	3	5	1	5	7
Taxi^	*	*	*	*	*	*	*	1	*
Other / Combo / NA	2	2	2	4	3	4	4	3	4
	100	100	100	100	100	100	100	100	100

^ The Uber and Taxi response categories were added to the questionnaire in 2016. Data for 2014 was pulled from open-ended responses provided in the "other" category.

* Less than 1%

WHERE PARKED/FEE

6a. Where did you park?
6b. What fee, if any, did you pay to park?

- Among those who provided a response to this question, most parked in BART parking; the daily fee was the most common type of parking fee paid.

	Total		
	2014	2016	2018
Base: (Drove/Carpooled)	1,904	1,791	1,827
	(%)	(%)	(%)
Where Parked			
BART parking^	71	70	73
Other parking^	19	21	17
Don't know/No answer	10	9	10
	100	100	100
Fee Paid			
None/Free	30	19	20
Daily Fee	36	41	41
Single day reserved	1	2	3
Monthly permit	7	6	8
Don't know/No answer	26	32	28
	100	100	100

	Peak			Off-Peak			Weekend		
	2014	2016	2018	2014	2016	2018	2014	2016	2018
Base: (Drove/Carpooled)	1,070	1,013	1,099	593	588	534	241	190	193
	%	%	%	%	%	%	%	%	%
Where Parked									
BART parking^	74	73	77	63	65	63	76	74	77
Other parking^	16	19	15	26	26	25	12	14	9
Don't know/No answer	9	8	8	10	9	11	11	12	14
	100	100	100	100	100	100	100	100	100
Fee Paid									
None/Free	24	13	13	28	17	20	63	57	59
Daily Fee	43	48	48	37	41	39	5	6	4
Single day reserved	2	1	4	1	3	3	*	*	-
Monthly permit	9	7	10	5	5	8	1	1	1
Don't know/No answer	22	30	26	29	35	31	31	36	37
	100	100	100	100	100	100	100	100	100

^ In the 2016 and 2014 surveys, these categories were "In BART lot" and "Off-site."
* Less than 1%
- Zero

CLIPPER USE

7. Did you use a Clipper card to pay for this BART trip?

- Most riders (84%) used Clipper to pay for their BART trip.
- Peak period riders are the most likely to use Clipper at 88%, while Clipper use on weekends has grown the most dramatically, with 71% of weekend riders reporting Clipper usage.^

	Total		
	2014	2016	2018
Base: (All Respondents)	5,609	5,342	5,294
	(%)	(%)	(%)
Yes	64	71	84
No	35	28	15
Don't know/No answer	1	1	1
	100	100	100

	Peak			Off-Peak			Weekend		
	2014	2016	2018	2014	2016	2018	2014	2016	2018
Base: (All Respondents)	2,724	2,712	2,748	2,040	1,951	1,855	845	678	690
	%	%	%	%	%	%	%	%	%
Yes	70	78	88	60	67	82	50	54	71
No	29	22	11	39	32	17	48	45	28
Don't know/No answer	1	*	1	1	1	1	1	1	1
	100	100	100	100	100	100	100	100	100

^Note that the percentage of surveyed riders using Clipper is slightly higher than actual Clipper usage on BART in September 2018. Clipper's actual share of total trips was 81%, and Clipper's actual share of weekend trips was 67%. This slight discrepancy may be due to survey respondents responding in the affirmative if they have a Clipper card, even if they did not use the card for the surveyed trip.

* Less than 1%

FARE

8. What type of fare did you pay for this BART trip?

- About three-fourths of all riders pay the regular fare.
- Usage of the high-value discount fare is highest among peak riders.

	Total		
	2014	2016	2018
Base: (All Respondents)	5,609	5,342	5,294
	(%)	(%)	(%)
Regular ticket	74	75	76
High Value Discount	13	14	13
Senior	4	4	4
Disabled	2	2	2
Muni Fast Pass	3	2	2
Youth	°	°	1
Student	*	1	°
Other/Don't know/NA	3	2	3
	100	100	100

	Peak			Off-Peak			Weekend		
	2014	2016	2018	2014	2016	2018	2014	2016	2018
Base: (All Respondents)	2,724	2,712	2,748	2,040	1,951	1,855	845	678	690
	%	%	%	%	%	%	%	%	%
Regular ticket	70	70	74	76	77	77	83	83	82
High Value Discount	18	19	17	11	11	9	4	5	4
Senior	3	3	3	5	5	5	5	5	6
Disabled	1	2	1	2	2	2	1	2	2
Muni Fast Pass	4	2	2	2	2	2	2	1	1
Youth	°	°	1	°	°	1	°	°	2
Student	*	1	°	*	*	°	*	*	°
Other/Don't know/NA	3	2	2	3	2	3	4	3	3
	100	100	100	100	100	100	100	100	100

* Less than 1%
° Choice not offered on that year's survey.

SEATING AVAILABILITY

9. After you boarded the train for this trip, did you stand because seating was unavailable?

- Thirty-four percent of riders had to stand because seating was unavailable. This is similar to the last survey when 36% reported having to stand.
- Peak period riders were much more likely to report having to stand.

	Total		
	2014	2016	2018
Base: (All Respondents)	5,609	5,342	5,294
	(%)	(%)	(%)
Yes – whole trip	16	22	21
Yes – part of trip	14	14	13
Yes (mult. response/unspecified)	*	*	*
No (did not stand)	69	63	66
Don't know/No answer	1	1	1
	100	100	100

	Peak			Off-Peak			Weekend		
	2014	2016	2018	2014	2016	2018	2014	2016	2018
Base: (All Respondents)	2,724	2,712	2,748	2,040	1,951	1,855	845	678	690
	%	%	%	%	%	%	%	%	%
Yes – whole trip	21	31	29	12	13	12	9	9	9
Yes – part of trip	15	15	14	14	14	11	13	12	12
Yes (mult. response/unspec.)	*	*	*	*	*	*	*	-	*
No (did not stand)	63	53	56	73	71	76	77	77	78
Don't know/No answer	1	1	*	1	1	1	2	1	1
	100	100	100	100	100	100	100	100	100

* Less than 1%
- Zero

LENGTH OF TIME A BART CUSTOMER

10. How long have you been riding BART?

- Just over half of survey respondents have been riding BART for more than five years.
- Seventeen percent of riders have been riding BART for less than one year.

Total

	2014	2016	2018	
Base: (All Respondents)	5,609	5,342	5,294	
	(%)	(%)	(%)	
Six months or less	14	13	13	
More than six months but less than a year	5	4	5	**Less than a Year = 17%**
1 – 2 years	13	15	13	
3 – 5 years	15	17	17	
More than five years	53	51	52	**More than 5 Years = 52%**
Don't know/No answer	1	*	*	
	100	100	100	

	Peak			Off-Peak			Weekend		
	2014	2016	2018	2014	2016	2018	2014	2016	2018
Base: (All Respondents)	2,724	2,712	2,748	2,040	1,951	1,855	845	678	690
	%	%	%	%	%	%	%	%	%
Six months or less	12	12	12	15	13	12	17	15	16
More than six months but less than a year	5	5	5	4	4	4	4	4	4
1 – 2 years	14	15	13	13	14	13	12	12	14
3 – 5 years	15	17	17	15	17	18	13	16	13
More than five years	54	50	52	52	52	52	53	52	53
Don't know/No answer	1	*	*	*	*	1	1	*	1
	100	100	100	100	100	100	100	100	100

*Less than 1%

FREQUENCY OF RIDING BART

11. How often do you currently ride BART?

- The majority of BART trips (84%) are made by customers who ride BART at least one day per week.
- 59% of BART trips are made by frequent customers who ride five or more days per week. Within the peak period, this percentage is even higher; 68% of peak period trips are made by frequent customers.

	Total			
	2014	2016	2018	
Base: (All Respondents)	5,609	5,342	5,294	
	(%)	(%)	(%)	
5 or more days a week	56	59	59	
3 – 4 days a week	16	16	17	
1 – 2 days a week	10	9	8	**At least once/week = 84%**
1 – 3 days a month	9	8	8	
Less than once a month	8	7	7	
Don't know/No answer	1	1	1	
	100	100	100	

	Peak			Off-Peak			Weekend		
	2014	2016	2018	2014	2016	2018	2014	2016	2018
Base: (All Respondents)	2,724	2,712	2,748	2,040	1,951	1,855	845	678	690
	%	%	%	%	%	%	%	%	%
5 or more days a week	67	69	68	51	54	56	33	34	32
3 – 4 days a week	15	16	16	18	18	19	11	12	13
1 – 2 days a week	7	6	6	11	11	10	15	14	13
1 – 3 days a month	5	5	5	10	8	8	20	22	20
Less than once a month	5	4	4	9	7	6	19	17	21
Don't know/No answer	1	*	1	1	1	1	2	1	2
	100	100	100	100	100	100	100	100	100

*Less than 1%

OVERALL SATISFACTION WITH BART

12. Overall, how satisfied are you with the services provided by BART?

- Overall satisfaction with BART has continued to decline.
- The declines have occurred among both weekday and weekend riders.

	Total		
	2014	2016	2018
Base: (All Respondents)	5,609	5,342	5,294
	(%)	(%)	(%)
Very Satisfied	28	24	16
Somewhat Satisfied	46	45	40
Neutral	15	17	22
Somewhat Dissatisfied	8	11	15
Very Dissatisfied	2	3	6
Don't know/No answer	1	*	*
	100	100	100
MEAN: (5 point scale)	3.90	3.75	3.44

Very or Somewhat Satisfied = 56%

	Peak			Off-Peak			Weekend		
	2014	2016	2018	2014	2016	2018	2014	2016	2018
Base: (All Respondents)	2,724	2,712	2,748	2,040	1,951	1,855	845	678	690
	%	%	%	%	%	%	%	%	%
Very Satisfied	25	21	14	30	25	17	33	31	21
Somewhat Satisfied	48	47	41	45	44	39	44	43	41
Neutral	15	16	22	15	18	23	14	19	24
Somewhat Dissatisfied	9	13	16	8	9	15	6	6	11
Very Dissatisfied	2	4	8	2	4	5	2	1	3
Don't know/No answer	1	*	*	*	1	1	1	*	1
	100	100	100	100	100	100	100	100	100
MEAN: (5 point scale)	3.84	3.67	3.37	3.93	3.79	3.47	4.02	3.96	3.66

* Less than 1%

OVERALL SATISFACTION WITH BART (continued)

GROUP	BASE #	Satisfied %	Neutral %	Dissatisfied %	NA %	MEAN (5 point scale)
		Read % across				
TOTAL 2018						
By Frequency of Riding BART						
3+ days a week	4,015	53	23	24	*	3.34
Less frequently but at least monthly	835	65	21	14	-	3.67
Less often	387	68	24	7	1	3.93
By Gender						
Male	2,547	59	22	19	*	3.52
Female	2,640	53	23	23	*	3.37
By Age						
13 – 34	2,504	52	27	20	*	3.39
35 – 64	2,411	58	19	23	*	3.45
65 & Older	271	75	11	14	*	3.93
By Standing/Not Standing						
Yes	1,782	46	24	30	*	3.16
No	3,482	61	22	17	*	3.59
By Ethnicity						
White	2,017	61	19	20	*	3.52
Black/African Amer.	584	54	25	20	1	3.47
Asian/Pac. Islander	1,780	52	26	22	*	3.39
Hispanic	848	54	25	21	1	3.43
Other	221	49	19	32	-	3.20
By Disabled Fare Type						
Disabled discount	88	66	17	16	2	3.74

* Less than 1%
- Zero

OVERALL SATISFACTION WITH BART (continued)

GROUP	BASE #	Satisfied %	Neutral %	Dissatisfied %	NA %	MEAN (5 point scale)
		Read % across				
TOTAL 2018						
By Trip Purpose						
Commute to Work	3,601	52	23	25	*	3.31
School	301	63	23	14	*	3.63
Shopping	106	63	27	9	1	3.77
Medical/Dental	52	63	18	19	-	3.59
Airplane Trip	119	68	17	15	-	3.83
Sports Event	71	66	24	9	1	3.83
Visit Friends/Family	350	66	20	13	*	3.78
Restaurant	71	70	17	13	-	3.80
Theater/Concert	176	67	23	9	*	3.76
By Access Mode						
Walk	1,649	59	21	19	*	3.52
Bike	281	64	15	20	-	3.58
Bus/Transit	694	65	21	13	1	3.70
Drive alone	1,535	48	25	28	-	3.21
Carpool	292	58	20	20	1	3.49
Dropped off	463	52	27	20	1	3.41
Uber, Lyft, etc.	218	53	24	22	1	3.39
By Household Income						
Under $25,000	518	62	25	13	1	3.72
$25,000- $49,999	695	57	27	16	*	3.56
$50,000 - $74,999	795	55	21	23	*	3.41
$75,000 - $99,999	567	56	20	24	-	3.38
$100,000 - $199,999	1,385	56	21	23	*	3.40
$200,000 or more	726	55	21	24	-	3.33
By How Long Riding BART						
6 months or less	662	68	22	10	*	3.85
6 months – one year	241	61	22	17	1	3.54
One – two years	698	52	27	20	1	3.39
Three – five years	902	51	26	23	*	3.33
More than five years	2,769	55	21	24	*	3.39

* Less than 1%
- Zero

OVERALL SATISFACTION WITH BART (continued)

GROUP	BASE #	Satisfied %	Neutral %	Dissatisfied %	NA %	MEAN (5 point scale)
		Read % across				
TOTAL 2018						
By BART Recommendation						
Definitely	2,001	86	11	4	*	4.18
Probably	1,882	54	32	13	*	3.44
Might/Might not	898	20	33	47	*	2.66
Definitely/Probably not	488	8	14	78	*	1.89
By Statement, "BART is a Good Value for the Money"						
Agree strongly	1,003	90	7	3	*	4.32
Agree somewhat	1,877	70	20	9	*	3.73
Neutral	1,163	41	38	21	*	3.24
Disagree	1,206	20	24	56	*	2.46

*Less than 1%

WILLINGNESS TO RECOMMEND BART

13. Would you recommend using BART to a friend or out-of-town guest?

- Seventy-three percent would definitely or probably recommend using BART to a friend or out-of-town guest. This is down 12 percentage points vs. 2016. This drop has been driven by a decrease in those who would definitely recommend BART.

	Total			
	2014	2016	2018	
Base: (All Respondents)	5,609	5,342	5,294	
	(%)	(%)	(%)	
Definitely	59	55	38	**Definitely or Probably = 73%**
Probably	30	30	36	
Might or Might Not	8	10	17	
Probably Not	2	3	6	
Definitely Not	1	1	3	
Don't know/No answer	*	*	*	
	100	100	100	
MEAN: (5 point scale)	4.46	4.36	3.99	

	Peak			Off-Peak			Weekend		
	2014	2016	2018	2014	2016	2018	2014	2016	2018
Base: (All Respondents)	2,724	2,712	2,748	2,040	1,951	1,855	845	678	690
	%	%	%	%	%	%	%	%	%
Definitely	56	52	34	62	56	41	64	63	44
Probably	32	32	36	29	29	34	27	28	38
Might or Might Not	9	11	18	7	10	17	7	7	13
Probably Not	2	3	7	2	2	5	1	1	3
Definitely Not	1	1	4	1	1	3	*	1	2
Don't know/No answer	1	*	*	*	1	1	1	*	1
	100	100	100	100	100	100	100	100	100
MEAN: (5 point scale)	4.41	4.31	3.91	4.50	4.36	4.05	4.54	4.51	4.20

*Less than 1%

VALUE

14. To what extent do you agree with the following statement: "BART is a good value for the money?"

- Greater than half of BART riders (54%) agree with the statement: "BART is a good value for the money." This percentage has been declining since 2014.

	Total		
	2014	2016	2018
Base: (All Respondents)	5,609	5,342	5,294
	(%)	(%)	(%)
Agree Strongly	25	23	19
Agree Somewhat	38	36	35
Neutral	20	21	22
Disagree Somewhat	11	13	15
Disagree Strongly	5	6	8
Don't know/No answer	1	1	1
	100	100	100
MEAN: (5 point scale)	3.68	3.58	3.43

Agree Strongly or Somewhat = 54%

	Peak			Off-Peak			Weekend		
	2014	2016	2018	2014	2016	2018	2014	2016	2018
Base: (All Respondents)	2,724	2,712	2,748	2,040	1,951	1,855	845	678	690
	%	%	%	%	%	%	%	%	%
Agree Strongly	23	21	17	27	24	20	29	30	23
Agree Somewhat	37	36	35	38	36	35	40	36	37
Neutral	22	21	22	19	21	22	18	20	20
Disagree Somewhat	13	15	16	10	12	14	9	9	12
Disagree Strongly	5	6	8	5	6	8	3	4	5
Don't know/No answer	1	1	*	1	1	1	1	1	2
	100	100	100	100	100	100	100	100	100
MEAN: (5 point scale)	3.61	3.50	3.37	3.73	3.62	3.45	3.83	3.79	3.61

*Less than 1%

GENDER

15. Gender

	Total		
	2014	2016	2018
Base: (All Respondents)	5,609	5,342	5,294
	(%)	(%)	(%)
Male	49	47	48
Female	49	48	50
Another gender	°	1	1
No answer	2	4	2
	100	100	100

	Peak			Off-Peak			Weekend		
	2014	2016	2018	2014	2016	2018	2014	2016	2018
Base: (All Respondents)	2,724	2,712	2,748	2,040	1,951	1,855	845	678	690
	%	%	%	%	%	%	%	%	%
Male	47	46	45	50	49	53	49	48	47
Female	50	50	53	48	46	45	48	47	50
Another gender	°	*	*	°	1	1	°	1	1
No answer	2	4	1	2	4	2	3	4	2
	100	100	100	100	100	100	100	100	100

° Choice not offered on that year's survey.
* Less than 1%

AGE

16. Age

- Sixty-eight percent of BART riders are under age 45.
- On weekends, nearly one in four riders is 18 – 24 years old.

	Total			
	2014	2016	2018	
Base: (All Respondents)	5,609	5,342	5,294	
	(%)	(%)	(%)	
13 – 17	2	2	2	
18 – 24	16	15	14	
25 – 34	31	33	32	
35 – 44	19	19	20	**Under 45 = 68%**
45 – 54	15	14	15	
55 – 64	11	10	10	
65 and older	5	5	5	
Don't know/No answer	1	2	2	
	100	100	100	

	Peak			Off-Peak			Weekend		
	2014	2016	2018	2014	2016	2018	2014	2016	2018
Base: (All Respondents)	2,724	2,712	2,748	2,040	1,951	1,855	845	678	690
	%	%	%	%	%	%	%	%	%
13 – 17	2	1	1	2	2	1	3	3	3
18 – 24	12	11	11	18	17	15	22	23	24
25 – 34	29	34	33	32	32	31	32	30	30
35 – 44	22	22	22	17	17	20	13	16	13
45 – 54	19	15	16	13	14	14	12	12	12
55 – 64	11	10	11	11	10	10	9	9	9
65 and older	4	4	4	6	7	6	7	6	7
Don't know/No answer	1	2	2	1	2	2	2	2	2
	100	100	100	100	100	100	100	100	100

PERSONAL VEHICLE

17. Do you have a car or motorcycle?

- More than two-thirds (68%) of BART riders have a car or motorcycle. Peak riders are more likely to have a vehicle, compared to off-peak and weekend riders.

	Total		
	2014	2016	2018
Base: (All Respondents)	5,609	5,342	5,294
	(%)	(%)	(%)
Yes	º	º	68
No	º	º	31
Don't know/No answer	º	º	1
	100	100	100

	Peak			Off-Peak			Weekend		
	2014	2016	2018	2014	2016	2018	2014	2016	2018
Base: (All Respondents)	2,724	2,712	2,748	2,040	1,951	1,855	845	678	690
	%	%	%	%	%	%	%	%	%
Yes	º	º	75	º	º	63	º	º	56
No	º	º	24	º	º	36	º	º	43
Don't know/No answer	º	º	1	º	º	1	º	º	1
	100	100	100	100	100	100	100	100	100

º Question was not asked in 2014 and 2016.

SMART PHONE

18. Do you have a smart phone (can access internet, use apps)?

- Nearly all (95%) riders have a smart phone.

	Total		
	2014	2016	2018
Base: (All Respondents)	5,609	5,342	5,294
	(%)	(%)	(%)
Yes	º	º	95
No	º	º	4
Don't know/No answer	º	º	1
	100	100	100

	Peak			Off-Peak			Weekend		
	2014	2016	2018	2014	2016	2018	2014	2016	2018
Base: (All Respondents)	2,724	2,712	2,748	2,040	1,951	1,855	845	678	690
	%	%	%	%	%	%	%	%	%
Yes	º	º	96	º	º	94	º	º	94
No	º	º	3	º	º	5	º	º	5
Don't know/No answer	º	º	1	º	º	1	º	º	2
	100	100	100	100	100	100	100	100	100

º Question was not asked in 2014 and 2016.

ETHNIC IDENTIFICATION

19. What is your race or ethnic identification? *(Check one or more.)*

- BART has a diverse ridership.

	Total		
	2014	2016	2018
Base: (All Respondents)	5,609	5,342	5,294
	(%)	(%)	(%)
White	45	44	38
Asian or Pacific Islander	29	31	34
Hispanic	°	°	16
Black/African American	12	12	11
American Indian or Alaska Native	2	2	2
Other/No answer	16	15	6
Hispanic	19	18	°

	Peak			Off-Peak			Weekend		
	2014	2016	2018	2014	2016	2018	2014	2016	2018
Base: (All Respondents)	2,724	2,712	2,748	2,040	1,951	1,855	845	678	690
	%	%	%	%	%	%	%	%	%
White	44	42	37	45	45	39	47	46	39
Asian or Pacific Islander	33	35	38	27	26	28	25	27	31
Hispanic	°	°	14	°	°	18	°	°	18
Black/African American	11	11	10	14	14	13	12	13	11
American Indian or Alaska Native	2	2	2	2	2	2	2	2	2
Other/No answer	15	14	5	16	17	6	16	17	6
Hispanic	18	17	°	19	20	°	19	21	°

Note: Multiple responses were accepted, so columns will not add to 100%. The ethnicity data on the next page are categorized differently, so the percentages shown will differ.

° In 2014 and 2016, Hispanic ancestry was derived by a separate question (listed in the tables above in the Hispanic row), and cases where "Hispanic" was written as a response to Q19 were included in the "Other" category in the tables above. In 2018, "Hispanic, Latino, or Spanish origin" was included in the responses for Q19.

BART CUSTOMER ETHNICITY COMPARED TO REGION

BART Customer Ethnicity Compared to Bay Area Counties in BART's Service Area

- BART customer ethnicities reflect the diversity of the region.
- The following table compares the reported ethnicity of BART riders (excluding non-response) to the 2017 American Community Survey estimates.

Race and Ethnicity
BART Compared to Bay Area Counties in BART's Service Area

	ALAMEDA	CONTRA COSTA	SAN FRANCISCO	SAN MATEO	FOUR-COUNTY TOTAL	BART 2018 CUST. SAT. SURVEY
Population	1,663,190	1,147,439	884,363	771,410	4,466,402	5,114
	%	%	%	%	%	%
White (non-Hispanic)	31	44	40	39	38	35
Black/African American (non-Hispanic)	10	8	5	2	7	10
Asian/Pacific Islander (non-Hispanic)	31	17	35	30	28	32
American Indian or Alaska Native (non-Hispanic)	*	*	*	*	*	1
Hispanic (any race)	22	26	15	24	22	17
Other, including 2+ Races (non-Hispanic)	5	6	5	4	5	5
Total	100	100	100	100	100	100

* Less than 1%

Sources:
- U.S. Census Bureau, 2017 American Community Survey 1-Year Estimates: Table C03002 "Hispanic or Latino Origin by Race." Universe: Total Population. (factfinder.census.gov)
- BART 2018 Customer Satisfaction Survey

Notes:
1) The ACS 2017 estimates shown only include data for the four counties within BART's service area: Alameda, Contra Costa, San Francisco, and San Mateo. Census tables adjust for unit non-response by weighting at the tract-level.
2) The categories shown in this table classify respondents based on single vs. two-plus race and Hispanic vs. non-Hispanic. The categories "White," "Black / African American," "Asian/Pacific Islander," and "American Indian/Alaska Native" only include respondents who reported a single race and are non-Hispanic. All two-plus race, non-Hispanic responses are included within "Other." All Hispanic responses are included within Hispanic, regardless of race. Note that ethnicity data are categorized differently in other charts within this report, so the percentages shown will differ.
3) The BART data distribution is based on 5,114 weighted responses and excludes 3% non-response.
4) Totals may not add to 100% due to rounding.

ENGLISH PROFICIENCY

20a. Do you speak a language other than English at home?
20b. If "Yes" to question 20a, how well do you speak English?

	Total		
	2014	2016	2018
Base: (All Respondents)	5,609	5,342	5,294
	(%)	(%)	(%)
Yes	37	39	41
No	62	59	57
Don't know/No answer	2	1	2
	100	100	100
Base: (Speak language other than English at home)	2,049	2,095	2,174
Very well	71	72	73
Well	21	19	18
Not well	5	5	5
Not at all	*	1	*
Don't know/No answer	3	3	4
	100	100	100

	Peak			Off-Peak			Weekend		
	2014	2016	2018	2014	2016	2018	2014	2016	2018
Base: (All Respondents)	2,724	2,712	2,748	2,040	1,951	1,855	845	678	690
	%	%	%	%	%	%	%	%	%
Yes	37	41	42	36	37	39	36	39	44
No	61	58	57	63	61	60	63	59	55
Don't know/No answer	2	1	2	2	2	2	1	1	1
	100	100	100	100	100	100	100	100	100
Base: (Speak language other than English at home)	1,011	1,104	1,151	732	724	719	306	268	304
Very well	74	74	77	70	70	71	65	67	66
Well	20	19	16	21	19	18	22	22	23
Not well	3	4	4	6	7	6	9	8	6
Not at all	*	1	*	1	1	*	*	*	1
Don't know/No answer	3	3	3	3	3	4	4	3	4
	100	100	100	100	100	100	100	100	100

* Less than 1%

INCOME

21. What is your total annual household income before taxes?^

- About four in every ten (40%) BART riders have household incomes of $100,000 or more.
- Peak riders' household incomes skew higher than incomes of riders in other time periods.

	Total			
	2014	2016	2018	
Base: (All Respondents)	5,609	5,342	5,294	
	(%)	(%)	(%)	
Under $25,000	17	14	10	
$25,000 – $49,999	18	16	13	**Under $50,000 = 23%**
$50,000 – $74,999	16	16	15	
$75,000 – $99,999	11	11	11	
$100,000 and over	30	34	40	**$100,000 or more = 40%**
Don't know/No answer	9	8	11	
	100	100	100	

	Peak			Off-Peak			Weekend		
	2014	2016	2018	2014	2016	2018	2014	2016	2018
Base: (All Respondents)	2,724	2,712	2,748	2,040	1,951	1,855	845	678	690
	%	%	%	%	%	%	%	%	%
Under $25,000	12	9	6	21	19	13	24	21	17
$25,000 – $49,999	15	13	11	20	18	15	22	23	17
$50,000 – $74,999	17	16	16	15	16	14	14	16	13
$75,000 – $99,999	14	12	11	10	10	10	8	11	11
$100,000 and over	34	40	45	27	29	36	22	22	29
Don't know/No answer	9	9	11	9	8	11	11	8	13
	100	100	100	100	100	100	100	100	100

^Income range categories were combined to allow comparison with data from prior years.

BART CUSTOMER HOUSEHOLD INCOMES COMPARED TO REGION

BART Customer Household Incomes Compared to Bay Area Counties in BART's Service Area

- BART customers' household incomes approximately track regional household income distribution; however, there is a notable difference at the highest income level.

Household Income

BART Compared to Bay Area Counties in BART's Service Area

Households	Alameda 573,589	Contra Costa 392,046	San Francisco 360,323	San Mateo 264,185	4 County Total 1,590,143	BART 2018 Customer Satisfaction Survey 4,686
	%	%	%	%	%	%
Under $25,000	13	12	16	9	13	11
$25,000-$34,999	6	6	5	4	5	6
$35,000-$39,999	3	3	2	3	3	3
$40,000-$49,999	5	6	4	4	5	5
$50,000-$59,999	5	6	4	4	5	7
$60,000-$74,999	8	8	6	7	7	10
$75,000-$99,999	12	12	9	12	11	12
$100,000-$149,999	19	19	17	18	18	18
$150,000-$199,999	12	11	11	13	12	11
$200,000 and over	18	18	26	26	21	15
Total	100	100	100	100	100	100

Sources:
- U.S. Census Bureau, 2017 American Community Survey 1-Year Estimates: Table B19001 "Household Income in the Past 12 Months." Universe: Households. (factfinder.census.gov)
- BART 2018 Customer Satisfaction Survey

Notes:
1) The ACS 2017 estimates shown include only data for the four counties within BART's service area: Alameda, Contra Costa, San Francisco, and San Mateo. Census tables adjust for unit non-response by weighting at the tract-level.
2) The BART data distribution is based on 4,686 weighted responses and excludes 11% non-response. Other tables within this report include non-response, so the percentages shown will differ.
3) Totals may not add up to 100 due to rounding.

NUMBER IN HOUSEHOLD

22. Including yourself, how many people live in your household?

- Household sizes have remained steady since 2014.
- Thirty-one percent of riders live in two-person households.

	Total		
	2014	2016	2018
Base: (All Respondents)	5,609	5,342	5,294
	(%)	(%)	(%)
One	17	18	16
Two	29	31	31
Three	19	20	20
Four	17	17	17
Five	7	6	8
Six or more	5	5	4
Don't know/No answer	6	3	4
	100	100	100

	Peak			Off-Peak			Weekend		
	2014	2016	2018	2014	2016	2018	2014	2016	2018
Base: (All Respondents)	2,724	2,712	2,748	2,040	1,951	1,855	845	678	690
	%	%	%	%	%	%	%	%	%
One	15	15	14	19	20	17	21	23	22
Two	28	32	33	29	30	29	31	30	29
Three	20	21	20	19	21	19	17	16	18
Four	19	18	18	16	16	16	12	15	13
Five	8	6	7	7	6	9	7	8	7
Six or more	4	5	4	6	6	5	5	6	5
Don't know/No answer	6	3	3	5	2	4	6	3	4
	100	100	100	100	100	100	100	100	100

RATING BART ON SPECIFIC ATTRIBUTES

23. Please help BART improve service by rating each of the following attributes. "7" (excellent) is the highest rating, and "1" (poor) is the lowest rating. You also can use any number in between. Skip attributes that do not apply to you.

POOR						EXCELLENT
1	2	3	4	5	6	7

NOTE: "7" is the highest rating a respondent can give and "1" is the lowest. Blank responses were eliminated when calculating the arithmetic mean.

RATING BART ON SPECIFIC ATTRIBUTES

OVERALL RATINGS	Mean Ratings (7-point scale)						Mean Score Change
	TOTAL			STRATA (2018)			
	2014	2016	2018	Peak	Off-Peak	Weekend	2018-2016
Base: (All Respondents)	5,609	5,342	5,294	2,748	1,855	690	
	#	#	#	#	#	#	#
Availability of maps/schedules	5.71	5.65	5.58	5.63	5.53	5.55	-0.07
bart.gov website	5.30	5.14	5.29	5.31	5.26	5.31	0.15
On-time performance of trains	5.46	5.27	5.21	5.12	5.27	5.37	-0.06
Timeliness of connections between BART trains	5.36	5.25	5.17	5.12	5.20	5.26	-0.08
Hours of operation	4.98	5.00	5.15	5.25	5.06	4.97	0.15
Timely information about service disruptions	5.26	5.24	5.02	5.00	5.01	5.10	-0.22
Availability of bicycle parking	5.01	4.97	4.96	4.94	4.95	5.07	-0.01
Frequency of train service	5.11	4.98	4.96	4.89	5.03	5.04	-0.02
Access for people with disabilities	5.13	5.03	4.80	4.70	4.88	4.98	-0.23
Timeliness of connections with other transit*	4.85	4.79	4.80	4.73	4.84	4.93	0.01
Lighting in parking lots	4.94	4.92	4.74	4.66	4.78	4.93	-0.18
BART system kept free of graffiti^	NA	NA	4.40	4.35	4.39	4.66	NA
Availability of car parking	4.41	4.23	4.24	4.14	4.22	4.72	0.01
Personal security in the BART system	4.49	4.28	3.58	3.45	3.64	3.96	-0.70
Enforcement of no eating and drinking policy	4.05	3.93	3.48	3.38	3.48	3.91	-0.45
Enforcement against fare evasion	4.47	4.19	3.36	3.20	3.43	3.82	-0.83
Addressing homelessness in the BART system^	NA	NA	2.85	2.70	2.90	3.37	NA

* In 2016 this was listed as "Timeliness of connections with buses"
^ Question not asked in 2016 or 2014

RATING BART ON SPECIFIC ATTRIBUTES (continued)

BART STATION RATINGS	Mean Ratings (7-point scale)						Mean Score Change 2018-2016
	TOTAL			STRATA (2018)			
	2014	2016	2018	Peak	Off-Peak	Weekend	
Base: (All Respondents)	5,609	5,342	5,294	2,748	1,855	690	
	#	#	#	#	#	#	#
Clipper cards	5.80	5.85	5.91	5.95	5.86	5.85	0.06
BART tickets	5.50	5.45	5.32	5.29	5.33	5.41	-0.13
Reliability of ticket vending machines	5.17	5.02	4.96	4.91	4.95	5.16	-0.06
Signs with transfer / platform / exit directions	5.06	4.97	4.93	4.93	4.91	4.95	-0.04
Length of lines at exit gates	5.04	4.85	4.89	4.77	4.96	5.21	0.04
Reliability of faregates	5.12	4.93	4.88	4.79	4.92	5.13	-0.05
Helpfulness and courtesy of Station Agents	4.79	4.79	4.56	4.50	4.61	4.68	-0.23
Availability of Station Agents	4.73	4.58	4.23	4.16	4.25	4.46	-0.35
Escalator availability/reliability	4.58	4.33	4.12	3.94	4.21	4.64	-0.21
Elevator availability/reliability	4.58	4.28	4.08	3.96	4.13	4.43	-0.20
Overall condition/state of repair	4.57	4.37	4.08	3.95	4.16	4.40	-0.29
Station cleanliness	4.11	3.93	3.57	3.45	3.65	3.86	-0.36
Presence of BART Police in stations	4.19	4.04	3.45	3.32	3.51	3.85	-0.59
Presence of BART Police outside BART stations^	NA	NA	3.41	3.27	3.47	3.84	NA
Elevator cleanliness	3.88	3.71	3.35	3.23	3.40	3.69	-0.36
Restroom cleanliness	3.52	3.39	3.01	2.85	3.12	3.34	-0.38

^ Attribute was phrased as "Presence of BART Police in Parking Lots" in 2016 and 2014

RATING BART ON SPECIFIC ATTRIBUTES (continued)

BART TRAIN RATINGS	Mean Ratings (7-point scale)						Mean Score Change
	TOTAL			STRATA (2018)			
	2014	2016	2018	Peak	Off-Peak	Weekend	2018-2016
Base: (All Respondents)	5,609	5,342	5,294	2,748	1,855	690	
	#	#	#	#	#	#	#
Comfort of seats on trains	4.84	4.85	4.62	4.50	4.69	4.92	-0.23
Availability of standing room on trains	4.61	4.40	4.49	4.27	4.65	4.95	0.09
Appearance of train exterior	4.59	4.46	4.24	4.18	4.22	4.49	-0.22
Comfortable temperature aboard trains	4.41	4.38	4.15	3.97	4.26	4.62	-0.23
Clarity of public address announcements	4.21	4.08	4.00	3.93	4.06	4.14	-0.08
Condition / cleanliness of windows on trains	4.32	4.22	3.97	3.88	4.01	4.21	-0.25
Availability of space on trains for luggage, bicycles, and strollers	4.06	3.86	3.83	3.57	4.01	4.44	-0.03
Condition / cleanliness of seats on trains	4.07	4.23	3.80	3.66	3.87	4.18	-0.43
Noise level on trains	4.08	3.67	3.80	3.71	3.83	4.06	0.13
Availability of seats on trains	4.18	3.86	3.76	3.44	4.02	4.40	-0.10
Train interior cleanliness	4.28	4.25	3.65	3.53	3.70	4.03	-0.60
Condition / cleanliness of floors on trains	4.05	4.05	3.54	3.42	3.57	3.98	-0.51
Presence of BART police on trains	3.65	3.51	3.08	2.94	3.12	3.54	-0.43

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Appendix C:
TESTS OF STATISTICAL SIGNIFICANCE 2018 VS. 2016

TEST OF STATISTICAL SIGNIFICANCE at the 95% Confidence Level

	2018					2016							
	Total Response	Don't know	Sample Size	Mean	Standard Deviation	Total Response	Don't know	Sample Size	Mean	Standard Deviation	Mean Difference	T-Score	Statistically Significant at 95?
OVERALL SATISFACTION	5,294	19	5,275	3.44	1.12	5,342	23	5,319	3.75	1.04	-0.31	-14.79206	yes
RECOMMEND TO FRIEND	5,294	25	5,269	3.99	1.04	5,342	23	5,319	4.36	0.87	-0.37	-19.88706	yes
"BART IS A GOOD VALUE"	5,294	44	5,250	3.43	1.18	5,342	47	5,295	3.58	1.15	-0.15	-6.60480	yes
On-time performance of trains	5,294	147	5,147	5.21	1.37	5,342	119	5,223	5.27	1.35	-0.06	-2.24772	yes
Hours of operation	5,294	203	5,091	5.15	1.57	5,342	179	5,163	5.00	1.63	0.15	4.74117	yes
Frequency of train service	5,294	237	5,057	4.96	1.49	5,342	222	5,120	4.98	1.48	-0.02	-0.67935	no
Availability of maps and schedules	5,294	307	4,987	5.58	1.36	5,342	280	5,062	5.65	1.33	-0.07	-2.60529	yes
bart.gov website	5,294	648	4,646	5.29	1.36	5,342	1,079	4,263	5.14	1.44	0.15	5.04542	yes
Timely information about service disruptions	5,294	474	4,820	5.02	1.49	5,342	338	5,004	5.24	1.43	-0.22	-7.45465	yes
Timeliness of connections between BART trains	5,294	763	4,531	5.17	1.36	5,342	723	4,619	5.25	1.31	-0.08	-2.86997	yes
Timeliness of connections with other transit*	5,294	1,330	3,964	4.80	1.49	5,342	1,692	3,650	4.79	1.51	0.01	0.29026	no
Availability of car parking	5,294	1,103	4,191	4.24	1.84	5,342	1,153	4,189	4.23	1.87	0.01	0.24698	no
Availability of bicycle parking	5,294	1,894	3,400	4.96	1.50	5,342	1,939	3,403	4.97	1.53	-0.01	-0.27180	no
Lighting in parking lots	5,294	1,259	4,035	4.74	1.54	5,342	1,317	4,025	4.92	1.45	-0.18	-5.41019	yes
Access for people with disabilities	5,294	1,654	3,640	4.80	1.64	5,342	1,795	3,547	5.03	1.55	-0.23	-6.10267	yes
Personal security in BART system	5,294	600	4,694	3.58	1.79	5,342	692	4,650	4.28	1.68	-0.70	-19.48479	yes
Enforcement against fare evasion	5,294	890	4,404	3.36	2.00	5,342	1,339	4,003	4.19	1.89	-0.83	-19.54148	yes
Enforcement of no eating and drinking policy	5,294	774	4,520	3.48	2.01	5,342	945	4,397	3.93	1.95	-0.45	-10.73581	yes
BART system kept free of graffiti	5,294	764	4,530	4.40	1.85	Not asked in 2016							
Addressing homelessness on the BART system	5,294	600	4,694	2.85	1.89	Not asked in 2016							
Length of lines at exit gates	5,294	396	4,898	4.89	1.49	5,342	329	5,013	4.85	1.53	0.04	1.31772	no
Reliability of ticket vending machines	5,294	718	4,576	4.96	1.52	5,342	653	4,689	5.02	1.50	-0.06	-1.91372	no
Reliability of faregates	5,294	557	4,737	4.88	1.50	5,342	543	4,799	4.93	1.50	-0.05	-1.62656	no
Clipper cards	5,294	514	4,780	5.91	1.24	5,342	712	4,630	5.85	1.27	0.06	2.31955	yes
BART tickets	5,294	1,172	4,122	5.32	1.42	5,342	1,026	4,316	5.45	1.34	-0.13	-4.32246	yes
Escalator availability and reliability	5,294	599	4,695	4.12	1.78	5,342	629	4,713	4.33	1.73	-0.21	-5.79998	yes
Elevator availability and reliability	5,294	1,328	3,966	4.08	1.81	5,342	1,388	3,954	4.28	1.74	-0.20	-5.01916	yes
Presence of BART Police in stations	5,294	681	4,613	3.45	1.77	5,342	828	4,514	4.04	1.67	-0.59	-16.40599	yes
Presence of BART Police outside stations	5,294	776	4,518	3.41	1.80	Not asked in 2016							
Availability of Station Agents	5,294	638	4,656	4.23	1.72	5,342	693	4,649	4.58	1.61	-0.35	-10.13604	yes
Helpfulness & courtesy of Station Agents	5,294	753	4,541	4.56	1.78	5,342	776	4,566	4.79	1.68	-0.23	-6.34876	yes
Station cleanliness	5,294	483	4,811	3.57	1.79	5,342	538	4,804	3.93	1.75	-0.36	-9.97677	yes

(continued from prior page)	2018					2016							
	Total Response	Don't know	Sample Size	Mean	Standard Deviation	Total Response	Don't know	Sample Size	Mean	Standard Deviation	Mean Difference	T-Score	Statistically Significant at 95?
Restroom cleanliness	5,294	1,258	4,036	3.01	1.79	5,342	1,379	3,963	3.39	1.86	-0.38	-9.29775	yes
Elevator cleanliness	5,294	1,306	3,988	3.35	1.88	5,342	1,435	3,907	3.71	1.89	-0.36	-8.47769	yes
Signs with transfer / platform / exit directions	5,294	780	4,514	4.93	1.55	5,342	844	4,498	4.97	1.51	-0.04	-1.24135	no
Stations - Overall condition / state of repair	5,294	534	4,760	4.08	1.61	5,342	596	4,746	4.37	1.55	-0.29	-8.94126	Yes
Availability of seats on trains	5,294	342	4,952	3.76	1.80	5,342	326	5,016	3.86	1.80	-0.10	-2.77713	yes
Availability of space on trains for luggage, bikes, strollers	5,294	603	4,691	3.83	1.77	5,342	614	4,728	3.86	1.78	-0.03	-0.81967	no
Availability of standing room on trains	5,294	482	4,812	4.49	1.70	5,342	442	4,900	4.40	1.70	0.09	2.61135	yes
Comfort of seats on trains	5,294	491	4,803	4.62	1.58	5,342	436	4,906	4.85	1.47	-0.23	-7.42917	yes
Condition / cleanliness of seats on train	5,294	468	4,826	3.80	1.73	5,342	447	4,895	4.23	1.65	-0.43	-12.53911	yes
Comfortable temperature aboard trains	5,294	465	4,829	4.15	1.73	5,342	463	4,879	4.38	1.66	-0.23	-6.68971	yes
Noise level on trains	5,294	472	4,822	3.80	1.77	5,342	438	4,904	3.67	1.82	0.13	3.57601	yes
Clarity of public address announcements	5,294	548	4,746	4.00	1.75	5,342	548	4,794	4.08	1.74	-0.08	-2.23620	yes
Presence of BART Police on trains	5,294	723	4,571	3.08	1.78	5,342	820	4,522	3.51	1.76	-0.43	-11.57875	yes
Appearance of train exterior	5,294	609	4,685	4.24	1.67	5,342	635	4,707	4.46	1.57	-0.22	-6.56779	yes
Condition / cleanliness of windows on train	5,294	560	4,734	3.97	1.71	5,342	615	4,727	4.22	1.67	-0.25	-7.19189	yes
Train interior cleanliness	5,294	488	4,806	3.65	1.71	5,342	522	4,820	4.25	1.65	-0.60	-17.50921	yes
Condition / cleanliness of floors on trains	5,294	471	4,823	3.54	1.77	5,342	490	4,852	4.05	1.72	-0.51	-14.36950	yes

*This attribute was phrased as "Timeliness of connections with buses" on the 2016 questionnaire.

Appendix D:
SERVICE ATTRIBUTE RATINGS - PERCENTAGES

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Service Attribute Ratings – Percentages

Sorted in descending order on mean

SCALE: 1=Poor, 7=Excellent	Mean	Top Two	Neutral	Bottom Two	Don't know
	#				
Clipper cards	5.91	65	24	2	10
Availability of maps and schedules	5.58	57	34	3	6
BART tickets	5.32	40	34	3	22
bart.gov website	5.29	44	41	3	12
On-time performance of trains	5.21	46	47	4	3
Timeliness of connections between BART trains	5.17	39	43	3	14
Hours of operation	5.15	48	40	7	4
Timely information about service disruptions	5.02	38	46	6	9
Availability of bicycle parking	4.96	25	35	4	36
Frequency of train service	4.96	39	50	7	4
Reliability of ticket vending machines	4.96	36	44	7	14
Signs with transfer / platform / exit directions	4.93	36	43	7	15
Length of lines at exit gates	4.89	36	50	7	7
Reliability of faregates	4.88	34	49	7	11
Access for people with disabilities	4.80	26	35	7	31
Timeliness of connections with other transit	4.80	26	43	6	25
Lighting in parking lots	4.74	26	43	7	24
Comfort of seats on trains	4.62	29	52	10	9
Helpfulness and courtesy of Station Agents	4.56	31	42	13	14
Availability of standing room on trains	4.49	29	49	13	9
BART system kept free of graffiti	4.40	29	41	16	14
Availability of car parking	4.24	22	41	16	21
Appearance of train exterior	4.24	22	51	15	11
Availability of Station Agents	4.23	23	49	15	12
Comfortable temperature aboard trains	4.15	23	51	17	9
Escalator availability and reliability	4.12	22	48	19	11
Elevator availability and reliability	4.08	18	40	16	25
Stations - Overall condition / state of repair	4.08	17	57	16	10
Clarity of public address announcements	4.00	20	50	20	10
Condition / cleanliness of windows on train	3.97	18	52	19	11
Avail. of space on trains for luggage, bikes, strollers	3.83	17	49	23	11
Condition / cleanliness of seats on trains	3.80	16	53	23	9
Noise level on trains	3.80	16	51	24	9
Availability of seats on trains	3.76	17	51	26	6
Train interior cleanliness	3.65	13	53	25	9
Personal security in the BART system	3.58	14	48	27	11
Station cleanliness	3.57	14	49	28	9
Condition / cleanliness of floors on trains	3.54	14	49	28	9
Enforcement of no eating and drinking policy	3.48	17	37	32	15
Presence of BART Police in stations	3.45	12	47	29	13
Presence of BART Police outside stations	3.41	12	44	29	15
Enforcement against fare evasion	3.36	15	34	34	17
Elevator cleanliness	3.35	12	35	29	25
Presence of BART Police on trains	3.08	9	39	37	14
Restroom cleanliness	3.01	8	34	34	24
Addressing homelessness on the BART system	2.85	10	32	46	11

Note: Ratings are based on a scale of 1 - 7. Top Two includes 6 or 7 ratings, Neutral includes 3, 4, or 5 ratings, and Bottom Two includes 1 or 2 ratings.

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Appendix E:
DESCRIPTION OF METHODOLOGY AND RESPONSE RATE SUMMARY

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DESCRIPTION OF METHODOLOGY

FIELD PROCEDURES

In total, seven interviewers worked on the 2018 study, including one working supervisor. The interviewer training session was conducted at Corey, Canapary & Galanis' (CC&G) office in San Francisco on Monday, September 10, 2018, and the bulk of the field interviewing was conducted between September 11 and October 14, 2018. (A few remaining runs were surveyed on Saturday and Sunday, October 20 - 21.)

Interviewers, for the most part, worked in teams of two. Interviewers boarded randomly pre-selected BART trains and distributed questionnaires to all riders on one pre-determined BART car (also randomly selected). These interviewers rode nearly the whole route of their designated line continually collecting completed surveys and distributing surveys to new riders entering their car. Origination/destination stations for the interviewers were generally Balboa Park, Castro Valley, Pittsburg/Bay Point, El Cerrito Plaza, Fremont, San Francisco International Airport, and Millbrae. (Note that in 2018, the Concord origin/destination was changed to Pittsburg/Bay Point, and the South Hayward origin/destination was changed to Fremont. This was due to new end-of-line stations on these lines – Antioch and Warm Springs/South Fremont.)

The questionnaires were available in English, Spanish, and Chinese. Interviewers carried signs on the back of their clipboards that said in the respective languages: "I have surveys in English, Spanish, and Chinese." In 2018, 97 non-English language surveys were completed, representing 1.8% of total surveys (unweighted).

Tallies were kept for questionnaires taken home with riders to be mailed back and for all non-responses (refusals, language barrier, children under 13, sleeping, and left train). The definitions for non-responses are:

- *Language Barrier* - Non-response because a questionnaire is not available in a language understood by the rider.
- *Left Train* - The surveyor was unable to offer a questionnaire to a rider because of the short distance of that rider's trip.
- *Children under 13* - Children under 13 are not eligible for the survey.
- *Sleeping* – Sleeping riders are not offered a questionnaire.
- *Refusals* - Riders unwilling to accept/fill out the survey.

All surveys collected during a run were collated together into batches. During this process, coding of answers was completed, and surveys were individually examined to verify completeness and age of the respondent. Incomplete surveys and surveys from respondents under 13 years of age were removed. Data from the surveys were then input into a database.

Following inputting, randomly selected batches were pulled and reviewed for quality assurance. All of the surveys in the selected batches were compared to the data input for all questions to verify the accuracy of editors, coders, and data entry staff. A total of 656 surveys were reviewed in this manner (12% of all surveys). A further 4,297 surveys (81% of all surveys) were checked for data input on the key questions only (questions 12, 13, and 14).

DESCRIPTION OF METHODOLOGY (continued)

Prior to publishing this report, a final review resulted in a few minor changes to the data file. As such, a few items in this report differ from previously presented data: the total sample size changed from 5,292 to 5,294, and the average rating for Clipper cards increased 1.0% vs. the prior survey, rather than 0.9%. Additionally, this report does not compare the rating of the 2018 attribute "Presence of BART Police outside stations" against the 2016 attribute "Presence of BART Police in parking lots" due to the text change.

SAMPLING

Sampling was achieved by selecting BART train trips that most closely resembled trains selected for the 2016 study. The resulting sample of BART trains fell within three strata: peak, off-peak and weekend. Peak is defined as weekday trains dispatched between 5:30 am - 8:30 am and 3:30 pm - 6:30 pm. Off-peak includes trains dispatched all other weekday times. Weekend includes all trains dispatched on Saturday or Sunday.

Once all train selections were made, each trip (train run) was matched with an appropriate return trip on the same line. (For the few cases where a return trip was not available, it was treated as a one-way trip, and no return trip was assigned.) For each trip, one train car was randomly selected for interviewers to board. Interviewers attempted to survey all car riders through the destination station. This random car selection process resulted in a slight bias towards shorter trains. Riders on shorter trains had a higher likelihood of being selected than those on longer trains. In previous years, analysis has been performed on this issue and has demonstrated that this bias has no material effect on the results. The number of outgoing and returning trips totaled: peak – 38 trips; off-Peak – 58 trips; weekend – 44 trips.

WEIGHTING

The data were weighted by ridership segment to proportionately represent BART riders. The weighted ridership segments are defined identically to the sampling ridership segments except that weekend is broken into Saturday and Sunday. The resulting ridership segments are as follows: weekday peak, weekday off-peak, Saturday, and Sunday. The chart below shows the actual number of questionnaires by ridership segment and the number of questionnaires weighted to represent the proportional amount of riders in each. It also shows the number of riders the weighting is based on, as well as the percentage of riders these numbers represent.

	Weekday Peak	Weekday Off-peak	Saturday	Sunday	Weekly Total
Questionnaires completed	1,870	1,942	704	778	5,294
Questionnaires weighted by strata	2,748	1,855	401	289	5,294
Estimated # of BART trips*	1,296,122	874,992	189,088	136,367	2,496,569
Weighted %	51.9%	35.0%	7.6%	5.5%	100.0%

* Estimated number of BART trips taken from ridership averages from the following days during survey period: Monday, 10/1; Tuesday, 9/11; Wednesday, 9/12; Thursday, 9/27; Friday, 9/21; Saturday, 9/15; Sunday, 9/16.

2018 BART Customer Satisfaction Study

Response Rate / % of Riders Who Completed Survey / Distribution Rate

	Total	*Peak*	*Off-Peak*	*Weekend*
Children under 13	153	26	19	108
Language barrier	50	9	17	24
Sleeping	213	74	80	59
Left train	205	102	51	52
Refused	3,342	1,260	1,132	950
Already Participated	128	33	39	56
Partials (not processed)	332	81	120	131
Qst. distributed and not returned	1,201	381	400	420
TOTAL NON-RESPONSE	*5,624*	*1,966*	*1,858*	*1,800*
Completes collected	4,978	1,735	1,824	1,419
Completes mailed back	316	135	118	63
TOTAL COMPLETES	*5,294*	*1,870*	*1,942*	*1,482*
PASSENGERS ON SAMPLED CARS				
(Total completes + Total Non-response)	*10,918*	*3,836*	*3,800*	*3,282*

Response Rate & % of Riders Who Completed Survey				
PASSENGERS ON SAMPLED CARS	*10,918*	*3,836*	*3,800*	*3,282*
Less: Children Under 13	(153)	(26)	(19)	(108)
Language Barrier	(50)	(9)	(17)	(24)
Sleeping	(213)	(74)	(80)	(59)
POTENTIAL RESPONDENTS	*10,502*	*3,727*	*3,684*	*3,091*
TOTAL COMPLETES	*5,294*	*1,870*	*1,942*	*1,482*
Response Rate [1]	***50.4%***	***50.2%***	***52.7%***	***47.9%***
% of Riders Who Completed Survey [2]	***48.5%***	***48.7%***	***51.1%***	***45.2%***

Distribution Rate				
PASSENGERS ON SAMPLED CARS	*10,918*	*3,836*	*3,800*	*3,282*
Less: Children Under 13	(153)	(26)	(19)	(108)
Language Barrier	(50)	(9)	(17)	(24)
Sleeping	(213)	(74)	(80)	(59)
POTENTIAL RESPONDENTS	*10,502*	*3,727*	*3,684*	*3,091*
Total Completes	5,294	1,870	1,942	1,482
Qst. taken home and not returned by Oct 24	1,201	381	400	420
Partials (not processed)	332	81	120	131
TOTAL QST. DISTRIBUTED	*6,827*	*2,332*	*2,462*	*2,033*
Distribution Rate [3]	***65.0%***	***62.6%***	***66.8%***	***65.8%***

[1] Total Completes divided by Potential Respondents
[2] Total Completes divided by Passengers on Sampled Cars
[3] Total Questionnaires Distributed divided by Potential Respondents

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Appendix F:
CODING OF RESPONDENT COMMENTS

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CODING OF RESPONDENT COMMENTS

EDITING AND CODING

This section outlines editing and coding procedures utilized on the 2018 BART Customer Satisfaction Study. For the most part, information as provided by the respondent on the self-administered questionnaire was entered as recorded.

Editing procedures, where disparities occurred, were as follows:

Scaling Questions

- If multiples occurred where only one response was acceptable (e.g., both 5 and 6 circled on the Poor - Excellent scale or Agree Strongly and Agree Somewhat both checked), the answer input alternated between the higher and lower responses. On the first occurrence we took the higher response, and on the next occurrence we took the lower response, etc.
- In cases where bipolar discrepancies were observed (e.g., both 1 and 7 circled) the midpoint was used. Sometimes respondents would include notes like poor in this respect and excellent in another respect for a specific attribute.

The back side of the questionnaire included a section for comments. Overall, 1,478 respondents, or 28% of all respondents, provided comments. All of these written comments were typed into a database. The comments were then split and coded using a list of "department specific" codes provided by BART. The code list and incidence for each code are listed on the following page. A total of 2,678 comments were tabulated and coded. (Note: if a comment was included in multiple categories, it is counted more than once in this total.)

The verbatim comments for each code are made available to the BART departments responsible for each area. This provides them with an additional tool to understand the reasons for customer rating levels.

2018 Customer Satisfaction Study
Code Sheet – Comment Code Frequencies
[FREQUENCIES FOR EACH CATEGORY ARE INDICATED IN BRACKETS]

Code 1 | Agent Availability [11]
Code 2 | Bus / Muni / Caltrain Connections [16]
Code 3 | Bicycles [20]
Code 4 | General Compliments [103]
Code 5 | Disability / Senior Issues [30]
Code 6 | Escalators and Elevators (except cleanliness) [49]
Code 7 | Extensions [31]
Code 8 | Fares and Fare Policies [139]
Code 10 | Overall Train / Track Maintenance / Conditions [55]
Code 11 | Lighting [5]
Code 12 | Other Comments [96]
Code 13 | Announcements and PA (Public Address) Issues [35]
Code 14 | Personnel (Except Police) [55]
Code 15 | Parking [81]
Code 16 | Police / Enforcement (except bikes) / Security [463]
Code 17 | Overall Station Conditions / State of Repair [35]
Code 18 | Station Cleanliness (Except Graffiti) [118]
Code 19 | Service – Type, Amount, etc. [232]
Code 20 | Signage, Maps, and Printed Schedules [55]
Code 21 | Seats on Trains / Crowding [126]
Code 22 | Comments About Surveys / Research [23]
Code 23 | Train Cleanliness [281]
Code 24 | Temperature [48]
Code 25 | Fare Collection, including Fare Collection Equipment [27]
Code 26 | Wi-Fi / Technology [17]
Code 28 | Tickets [1]
Code 29 | Train Windows [2]
Code 30 | Clipper [22]
Code 31 | Need for More Restrooms / Open Restrooms [12]
Code 32 | Overall Car Condition [12]
Code 33 | New cars [65]
Code 34 | Homeless / Panhandling [301]
Code 35 | BART Transfers / Entry and Exit Lines [9]
Code 36 | Reliability / Delays / Delay Information [63]
Code 37 | Train Noise [40]

Appendix G: QUADRANT CHARTS BY RIDERSHIP SEGMENT

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QUADRANT CHARTS BY RIDERSHIP SEGMENT

The chart titled "2018 Quadrant Chart" (see page 21) is designed to help set priorities for future initiatives to improve customer satisfaction. It identifies those specific service attributes that are most important to BART customers on average and also shows which service attributes rate lowest. The "Target Issues" quadrant (top left) displays the most important service attributes in need of attention.

Values along the horizontal axis are average ratings. Customers marked their ratings on a scale of 1 = poor to 7 = excellent, so higher ratings on the right side of the Quadrant Chart are better scores, and those on the left side are worse. The vertical axis ("Derived Importance") scale was derived by correlating each of the service attributes with customers' overall satisfaction levels. Those service attributes having strong correlations with overall satisfaction are seen as "More Important," while those with weaker correlations are seen as "Less Important."

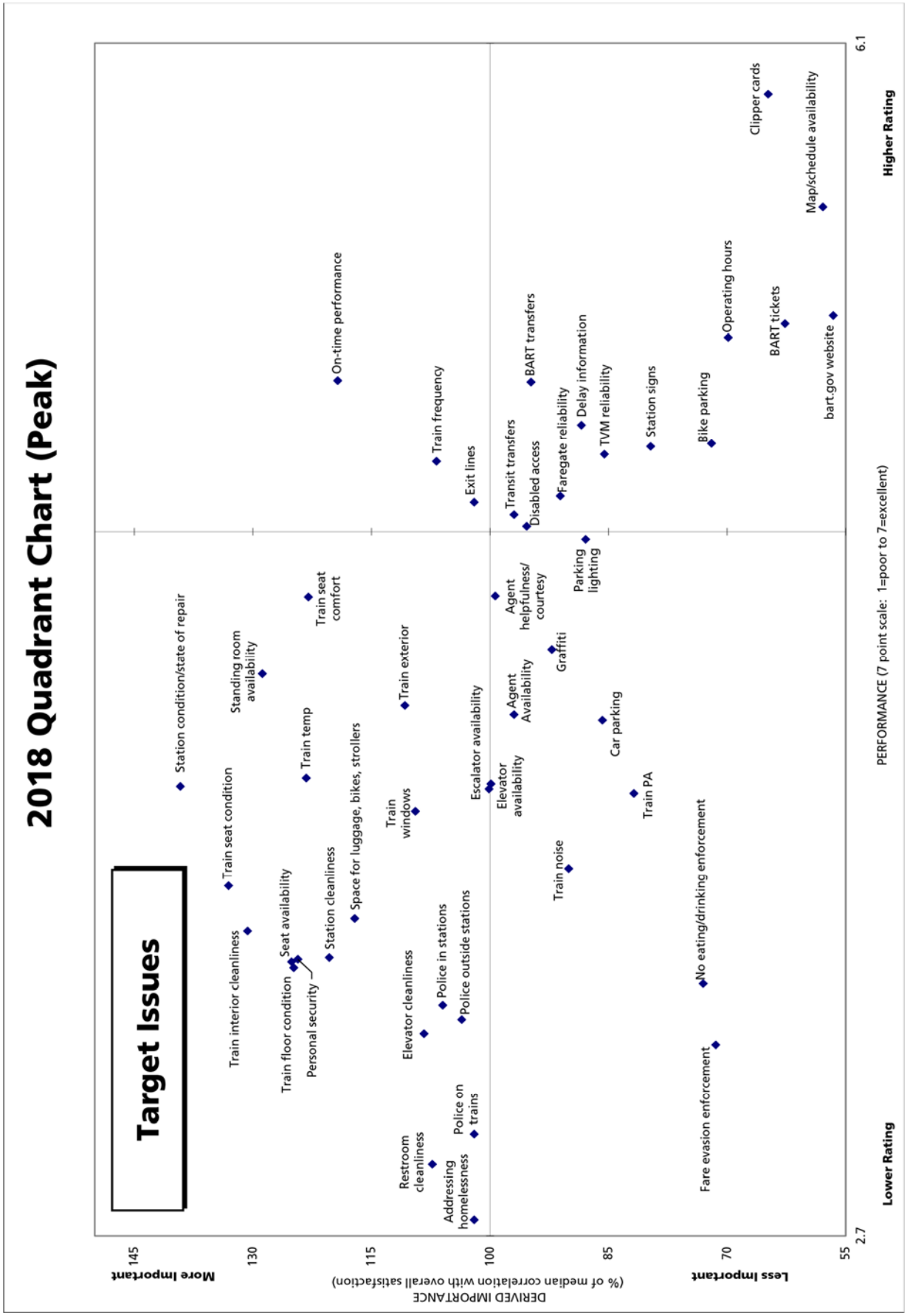
For example, customer ratings of station condition / state of repair are very strongly correlated with overall satisfaction (i.e., customers that are happy with station condition / state of repair tend to be more satisfied overall, and conversely, customers that are disappointed with station condition / state of repair tend to be less satisfied overall). On the other hand, customer ratings of the bart.gov website have only a weak correlation with overall satisfaction (i.e., it is not uncommon for customers to rate the bart.gov website highly, even though they are dissatisfied overall with BART services). Therefore, station condition / state of repair is located in the upper part of the chart, while the bart.gov website is located in the lower part.

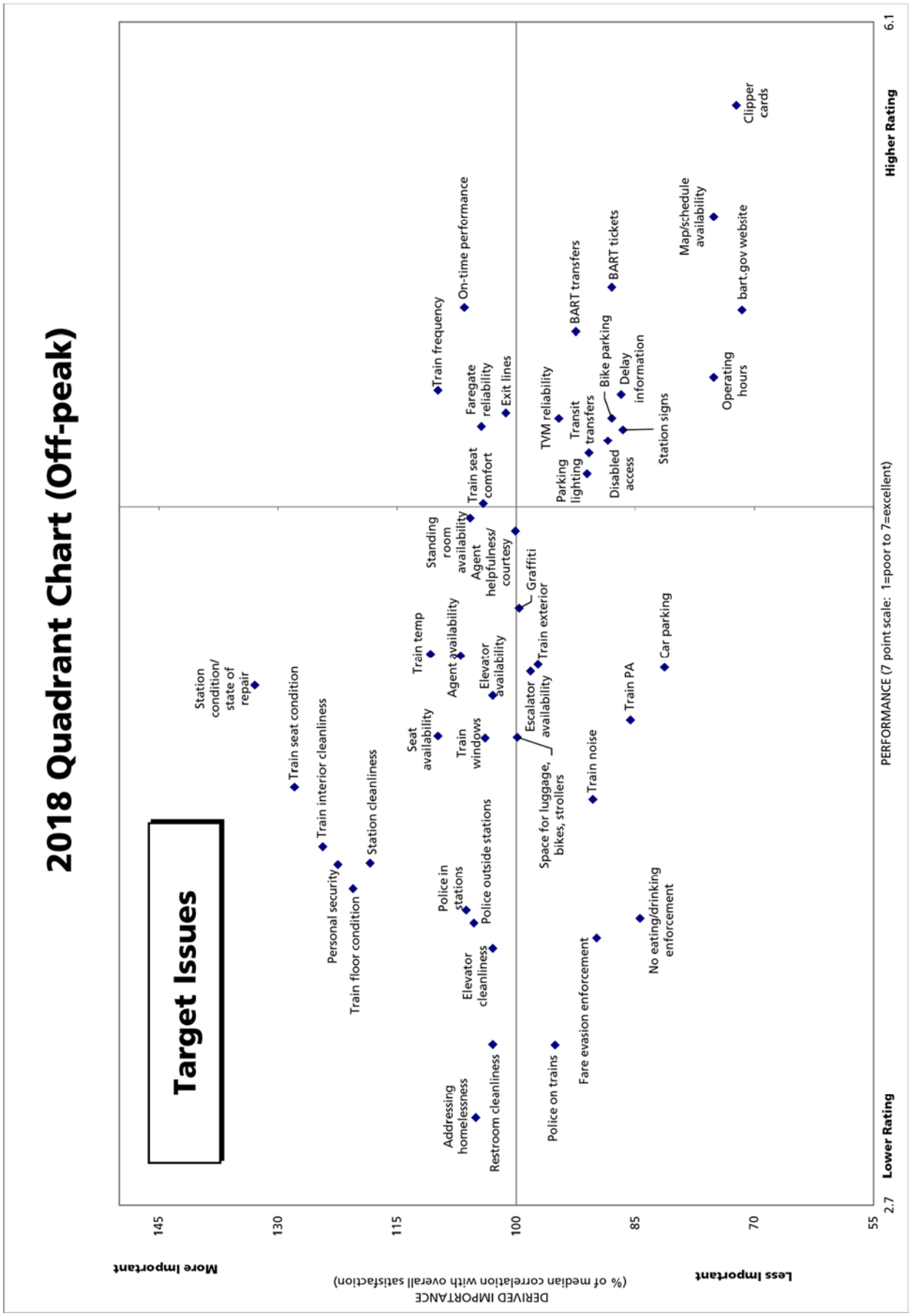
Specific values along the vertical axis are derived by calculating ratios between correlation coefficients for each service attribute and the median correlation level. Those service attributes above 100 are more correlated with overall satisfaction, while those below 100 are less so.

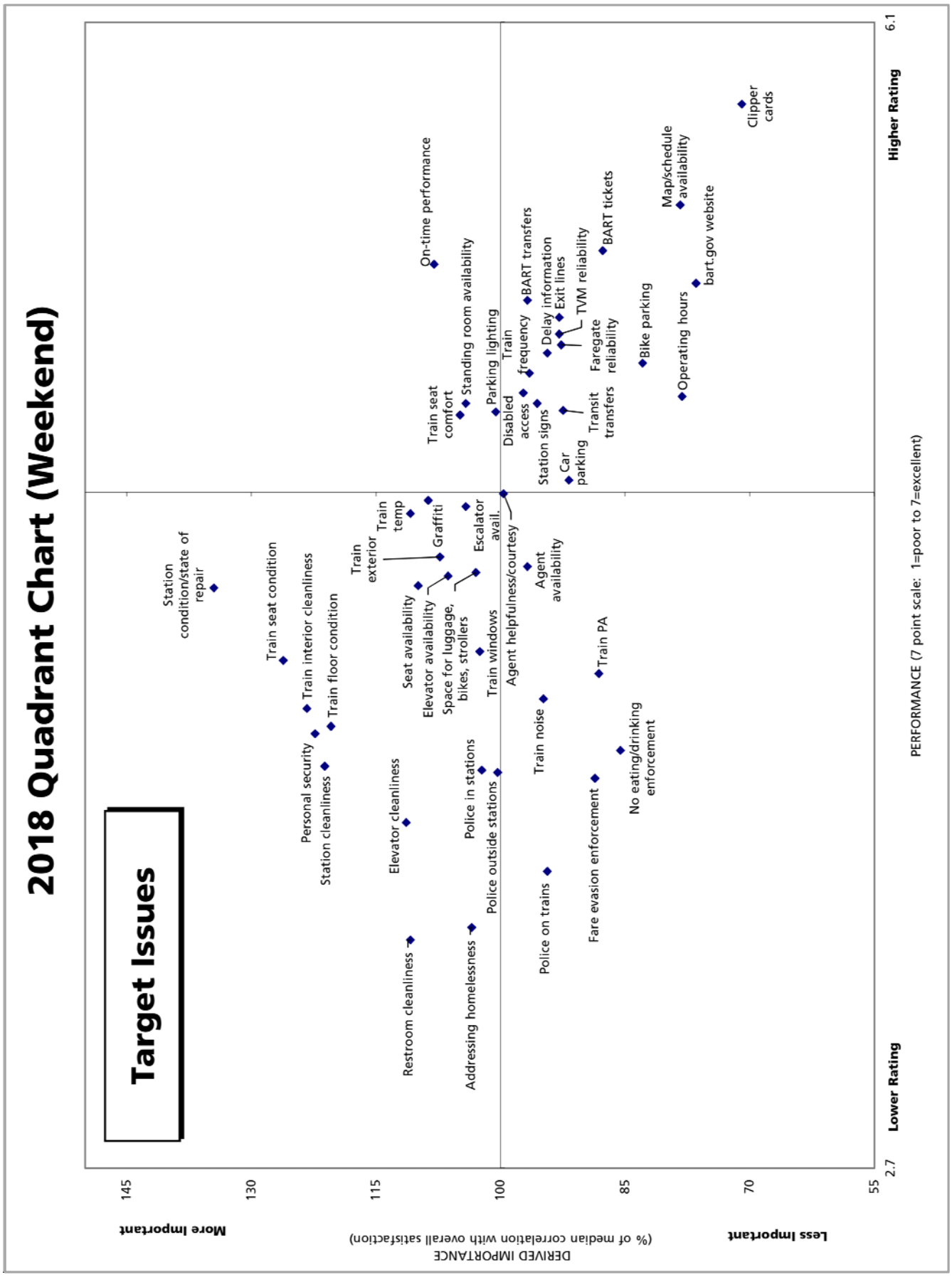
Note that some service attributes are seen as fairly unimportant on average because not all customers are affected by them, even though they are quite important to specific customer segments (e.g., availability of bicycle parking, availability of car parking, and timeliness of connections with other transit).

Also, note that more sophisticated statistical tests, utilizing factor and regression analyses, were done for the 1996 and 1998 Customer Satisfaction reports. This testing was not done in subsequent years as the results of the additional analyses were generally consistent with the correlation coefficient-based analysis used in the Quadrant Chart. Please refer to the 1998 Customer Satisfaction report for information on additional statistical testing done in past years.

The following pages show the Quadrant Charts for each of the three sample ridership segments: peak, off-peak, and weekend riders.


2018 Quadrant Chart (Peak)
Target Issues
Station condition/state of repair
Train seat condition
Standing room availability
Train interior cleanliness
Seat availability
Train temp
Train seat comfort
Train floor condition
Personal security
Station cleanliness
Space for luggage, bikes, strollers
On-time performance
Train frequency
Exit lines
Transit transfers
Disabled access
BART transfers
Faregate reliability
Delay information
TVM reliability
Station signs
Bike parking
Operating hours
BART tickets
bart.gov website
Map/schedule availability
Clipper cards
Agent helpfulness/ courtesy
Parking lighting
Graffiti
Train exterior
Agent Availability
Escalator availability
Elevator availability
Car parking
Train PA
Train noise
Train windows
Police outside stations
Police in stations
Elevator cleanliness
No eating/drinking enforcement
Fare evasion enforcement
Police on trains
Addressing homelessness
Restroom cleanliness
More Important
Less Important
DERIVED IMPORTANCE
(% of median correlation with overall satisfaction)
145
130
115
100
85
70
55
2.7
6.1
Lower Rating
Higher Rating
PERFORMANCE (7 point scale: 1=poor to 7=excellent)


2018 Quadrant Chart (Off-peak)
Target Issues
Station condition/ state of repair
Train seat condition
Train interior cleanliness
Personal security
Train floor condition
Station cleanliness
Police in stations
Police outside stations
Elevator cleanliness
Addressing homelessness
Restroom cleanliness
Police on trains
Fare evasion enforcement
No eating/drinking enforcement
Seat availability
Train windows
Space for luggage, bikes, strollers
Train noise
Train temp
Agent availability
Elevator availability
Escalator availability
Train PA
Car parking
Standing room availability
Agent helpfulness/ courtesy
Graffiti
Train exterior
Train frequency
On-time performance
Faregate reliability
Exit lines
Train seat comfort
TVM reliability
Transit transfers
Parking lighting
Disabled access
Bike parking
Delay information
Station signs
BART transfers
BART tickets
Map/schedule availability
Operating hours
bart.gov website
Clipper cards
145
130
115
100
85
70
55
More Important
Less Important
DERIVED IMPORTANCE
(% of median correlation with overall satisfaction)
2.7
Lower Rating
PERFORMANCE (7 point scale: 1=poor to 7=excellent)
6.1
Higher Rating


2018 Quadrant Chart (Weekend)
Target Issues
DERIVED IMPORTANCE
(% of median correlation with overall satisfaction)
More Important
Less Important
Lower Rating
Higher Rating
PERFORMANCE (7 point scale: 1=poor to 7=excellent)
145
130
115
100
85
70
55
2.7
6.1
Station condition/state of repair
Train seat condition
Train interior cleanliness
Train floor condition
Personal security
Station cleanliness
Elevator cleanliness
Restroom cleanliness
Addressing homelessness
Police in stations
Police outside stations
Train exterior
Train temp
Graffiti
Seat availability
Elevator availability
Space for luggage, bikes, strollers
Train windows
Escalator avail.
Agent helpfulness/courtesy
Agent availability
Train noise
Police on trains
Fare evasion enforcement
Train PA
No eating/drinking enforcement
On-time performance
Train seat comfort
Standing room availability
Parking lighting
Disabled access
Train frequency
BART transfers
Station signs
Delay information
Exit lines
Car parking
TVM reliability
Transit transfers
Faregate reliability
BART tickets
Bike parking
Map/schedule availability
Operating hours
bart.gov website
Clipper cards

July 8, 2011

Public Participation Plan

San Francisco **Bay Area Rapid Transit**

63452v1

Table of Contents

EXECUTIVE SUMMARY

Introduction

The Public Participation Plan (PPP) is a guide for San Francisco Bay Area Rapid Transit District's (BART) ongoing public participation endeavors. Its purpose is to ensure that BART utilizes effective means of providing information and receiving public input on transportation decisions from low income, minority and limited English proficient (LEP) populations, as required by Title VI of the Civil Rights Act of 1964 and its implementing regulations.

Under federal regulations, transit operators must take reasonable steps to ensure that Limited English Proficient (LEP) persons have meaningful access to their programs and activities. This means that public participation opportunities, normally provided in English, should be accessible to persons who have a limited ability to speak, read, write, or understand English.

In addition to language access measures, other major components of the PPP include: public participation design factors; a range of public participation methods to provide information, to invite participation and/or to seek input; examples to demonstrate how population-appropriate outreach methods can be and were identified and utilized; and performance measures and objectives to ensure accountability and a means for improving over time.

Summary of Findings

In general, PPP development participants requested that BART offer a variety of community meeting formats, from large group discussions to one-on-one interviews. They also are interested in utilizing methods other than community meetings, such as smaller focus groups, surveys, or a telephone line, to provide their input to BART. They further requested that meeting formats be tailored to specific public participation goals. Many participants stated that convenient meeting times and locations, plus amenities such as child care and refreshments during meetings, were helpful in encouraging diverse meeting attendance and participation.

The PPP development process revealed population-specific findings for low income, minority and LEP communities, demonstrating that effective public participation strategies make use of a variety of methods in order to reach the greatest possible diversity of participants. These findings are discussed in detail in Section III, "Public Participation Strategy Design Factors," and Section IV, "Public Participation Methods."

Comments and survey data from the PPP development process are used throughout the document in support of both general and population-specific

findings. Note that these comments and data are based specifically on PPP community meeting and survey participant responses, and are in no way meant to generalize views based on an individual's membership in a protected group. The surveys conducted during the PPP development process were not intended to be statistically valid, but were included as additional support to public input which was primarily received through verbal and written comments.

Summary of Process

In order to engage low income, minority and LEP populations in the development of the PPP, BART conducted two rounds of multi-lingual community meetings (29 total) throughout the BART service area in spring 2010. BART coordinated with community-based organizations (CBOs), offered translation services in 10 languages, and collected more than 1,350 surveys and 750 written comments through evaluation forms and wallgraphic notes recorded during meetings.

BART supplemented the extensive public participation process by conducting informational meetings with CBO stakeholders serving LEP populations in the BART service area. In May 2010, outreach that included telephone interviews and focus group meetings was conducted throughout the BART service area. In the fall of 2010, 19 LEP focus group meetings were conducted and attended by well over 400 LEP persons. The CBOs represented the following language groups: Chinese, Korean, Russian, Spanish, Tagalog and Vietnamese. Finally, an internal BART stakeholders' meeting was convened in May 2011 to review and reflect on internal stakeholders' experience with the PPP.

A database containing contact information for more than 1,000 individuals and more than 400 CBOs was created from outreach, surveys and sign-in sheets at the community meetings held throughout 2010, and will continue to be updated.

The input from these meetings validated the most successful practices that are described in this PPP. It also suggested revisions and enhancements based on lessons learned from the public participation methods conducted over the past year.

I. INTRODUCTION

A. San Francisco Bay Area Rapid Transit District (BART)

BART is a rapid transit system that travels through 26 cities and a four-county service area, including Alameda, Contra Costa, San Francisco and San Mateo counties. BART has 104 miles of track, 44 stations and an average weekday ridership of 360,000 passengers. During peak transbay commute hours, more than 50,000 people ride BART. BART provides discounted fares for seniors, persons with disabilities, students and qualified educational groups. Children ages 4 and under ride free.

BART opened in September 1972 and is governed by a directly-elected nine member Board of Directors serving four year terms.

BART provides a variety of written and oral language assistance services. These are identified in Appendix E: Frequency of Contact with LEP Individuals.

B. Purpose of the Public Participation Plan (PPP)

BART developed the PPP to guide public involvement efforts and enhance access to BART's transportation decision-making process by low income, minority and limited English proficient (LEP) populations. Based on both input collected from these populations regarding effective public involvement and on BART's experiences, the PPP describes the overall goals, guiding principles and appropriate outreach methods that BART could use to reach out to low income, minority and LEP populations.

Pursuant to Federal Transit Administration (FTA) Title VI regulatory guidance, federal funding recipients and subrecipients should seek out and consider the viewpoints of minority, low income and LEP populations "in the course of conducting public outreach and involvement activities." (FTA Circular 4702.1A) This guidance also requires that an agency offer "early and continuous opportunities for the public to be involved in the identification of social, economic and environmental impacts of proposed transportation decisions at BART." To meet these requirements, BART developed the PPP, a document intended as a guide for how BART will deepen and sustain its efforts to engage diverse community members throughout its service area. The PPP also includes example public participation strategies, designed using the PPP goals, principles and methods.

The PPP aims to offer early, continuous and meaningful opportunities for the public to be involved in the identification of social, economic and environmental impacts of proposed transportation decisions at BART. The PPP is intended as a guide for how BART will deepen and sustain its efforts to engage diverse community members throughout its service area. The PPP also includes example public participation strategies, designed using the PPP goals, principles and methods. These examples have proven successful for BART in doing outreach to these populations.

BART may continue to modify its public participation methods over time based on feedback from the low income, minority and LEP populations, including customer and community-based organizations, about the effectiveness and inclusiveness of the PPP. The PPP is intended to be a living document and may be updated periodically to reflect community preferences, changing demographics and transit services, as well as respond to new communication and outreach methods.

C. Process to Develop the PPP

To develop the PPP, BART hosted 22 community meetings throughout the BART service area between March 31, 2010 and April 21, 2010. The meetings were held to determine how BART could best provide information and receive public input on transportation issues from low income, minority and LEP populations.

Based on the feedback received, BART developed a draft PPP. BART mailed the draft PPP to all participants who provided their addresses on the sign-in sheets at the community meetings. The draft PPP was sent to participants in their preferred language, as indicated on the sign-in sheets, and in Braille to participants with visual impairments. BART also distributed the draft PPP to community-based organizations (CBOs) and posted it on the BART website. A printed comment form was included with the draft PPP.

BART conducted a second round of 7 meetings to discuss the draft PPP during the first three weeks of May 2010. The PPP incorporated the feedback and suggestions received during the community meetings, comments received through the website, written comment forms, letters and verbal comments expressed during the BART Board of Directors meeting held on May 13, 2010.

BART supplemented the extensive public participation process by conducting informational meetings with CBO stakeholders serving LEP populations in the BART service area. In May 2010, outreach was conducted that included telephone interviews and focus group meetings conducted throughout the BART service region. In the fall of 2010, 19 LEP focus group meetings were conducted and attended by CBOs serving LEP populations, as well as over 400 LEP persons. The CBOs represented the following language groups: Chinese, Korean, Russian, Spanish, Tagalog and Vietnamese. These six languages were identified as the most prevalent languages in the BART service area. They provided feedback on how to improve language assistance measures at BART, including use of BART fare equipment, safety and security, awareness of current language assistance measures, and improvements to BART's language assistance measures. In April and May 2011, BART conducted outreach to LEP populations to review BART's Language Assistance Plan (LAP) in preparation for inclusion in the PPP. Through each of these efforts, more than 400 people provided feedback on how to improve understanding and increase use of the BART system by persons with limited English proficiency.

Public Participation Survey

In addition, BART distributed a public participation survey at the PPP community meetings and to CBOs in the following languages: Spanish, Chinese, Tagalog, Russian, Korean and Vietnamese, and, in response to community requests for additional languages, in Laotian, Cambodian and Portuguese. The survey was also provided in Braille and posted on the BART website. BART received more than 1,350 responses to the survey. The survey queried participants regarding their preferences for public participation processes.

BART hired a consulting firm, MIG, Inc., a planning, design and communications firm in Berkeley, California, to assist with the development of the PPP. During development of the PPP, MIG staff served as neutral, third-party facilitators and recorded comments expressed at the community meetings. MIG transcribed and compiled the comments submitted in writing, tallied the meeting evaluation responses and transcribed participant contact information from the meeting sign-in sheets. MIG also assisted BART with the development of the PPP survey.

MIG provided an objective review of the findings from the meetings, comment cards and surveys; these findings and analysis were used to develop this PPP. MIG has compiled a PPP Development Summary Report on the Plan development outreach process, which includes the following appendices: a database of all public comments submitted; a tally and analysis of meeting evaluation responses; and a tally and analysis of survey responses.

Responses to surveys were tallied and analyzed by calculating the percentage of respondents who gave each possible multiple-choice answer. This analysis was performed both on overall data and on data from low income, minority and LEP respondents in order to determine where the preferences of those populations differed from or matched the overall results.

The surveys also included space for respondents to identify alternatives to the options given, as well as make general comments on the public participation process. Comments submitted in writing as well as graphic recordings of comments made during the meetings were compiled into a database. The comments were tracked by meeting location, source (whether from an online or print survey, comment card or meeting wallgraphic) and preferred language. Comments were categorized by both major themes and sub-themes developed with reference to meeting agendas and questions asked on the surveys. An example survey from the PPP development process is included as Appendix L.

Target Audience Identification

BART determined geographical areas where meetings would be held through a mapping analysis of Bay Area communities based on income and race. Using the results of the mapping, BART identified and contacted CBOs located in BART's four service

areas to determine their interest in assisting with outreach to these residents. The CBOs that BART contacted serve a broad range of community interests.

Community-Based Organizations

CBOs played an important role in the development of the PPP. BART worked with a variety of CBOs, including: ethnic cultural centers; churches and faith-based organizations; geographic-specific such as tenant associations; neighborhood and community groups; civic groups; business organizations; educational facilities including schools providing English as a Second Language programs; service providers for children, youth, families and persons with disabilities; recreation; environmental; political; youth- and senior-oriented organizations; and many others. Many CBOs were receptive to BART's request for assistance and BART staff worked closely with the CBOs to schedule and conduct outreach for the PPP meetings. The CBOs assisted BART by selecting meeting venues, recommending languages for translation and interpretive services, providing refreshments and childcare assistance, and helping to publicize the meeting and recruit participants. BART arranged and supplied staff support, interpreters, meeting materials, supplies and equipment for all of the meetings. The contacts and relationships established through the meeting planning process helped to renew and expand some of the partnerships BART had in place and provide a good foundation to implement the PPP over time. A comprehensive list of these CBOs can be found in Appendix B: BART Community-Based Organization Partners.

*Notification Methods for PPP Community Meetings**

- CBO Newsletters
- CBO Mailing Lists
- Direct Mail
- Ethnic Media
- Paid Advertisement
- Flyer Distribution to CBOs
- Flyer Distribution at BART Stations
- Flyer Distribution on BART Car Seats
- Posting on the BART website (www.bart.gov)
- Offices of city and county elected officials

Translation Services

Translated materials and interpretive services were available for every PPP community meeting in the nine languages already identified above under "Public Participation Survey," plus Braille. Written comments received in these languages were translated after the meetings and were included in the comments database (included as an appendix to the PPP Development Summary Report).

The PPP reflects participant preferences for how BART should invite, listen to and respond to all residents when making decisions that will affect them. The PPP identifies a menu of public participation methods to consult in the future. The plan and menu of methods was developed based on a review and analysis of comments expressed orally during the 29 community meetings, more than 750 written comments submitted on comment cards or evaluation forms and expressed during the meetings, and the results of more than 1,350 surveys.

The PPP also draws on the LAP. As part of the LAP development, the importance of BART services to persons with limited English proficiency was evaluated. LAP outreach activity findings highlight opportunities, challenges and access needs for public participation from and public outreach to LEP populations. One of the common themes that emerged from interviews conducted with CBOs and focus groups was that LEP community members were often unaware of BART's public participation due to the lack of translated information.

D. Low Income, Minority and LEP Population in BART Service Areas

BART periodically identifies the number and proportion of low income, minority and LEP population distribution in the four-county region that BART serves. BART uses the following thresholds to identify census tracts in the service area that are predominantly minority, low income and LEP:

- Low income: Using 2000 U.S. Census data, low income is defined as less than 200 percent of the federal poverty level.[1] The 200 percent threshold was used to account for the high cost of living in the Bay Area compared to the rest of the country. The 200 percent threshold is also consistent with the assumptions employed by the Metropolitan Transportation Commission in its February 2009 Equity Analysis Report. The percentage of low income population within BART's four county service area was determined to be 21.6 percent.
- Minority: Using the year 2000 Census data, 52.7 percent of the total population living within the BART service area are minority. This includes persons who self-identified as Black or African American, Asian or Pacific Islander, Native American or Alaska Native, Hispanic or Latino, and those persons who identified themselves as some other race or two or more races.
- Limited English Proficient (LEP): are persons for whom English is not their primary language and who have a limited ability to speak, understand, read, or write English. This definition includes people who reported to the U.S. Census that they do not speak English well or do not speak English at all. BART's analysis of 2000 U.S. Census data showed that LEP populations represent 18.6 percent of the total BART service area. Of the LEP populations, the largest

[1] As a reference, for a single person household, 200% of the federal poverty level in 2008 was $21,982. For a two-adult, two-child household, the 200% threshold was $43,668. (Note that the data mapped are based on 2000 Census data as these are the only such data available at the tract level.)

groups are Spanish-speaking (43%), Chinese-speaking (27%), Vietnamese-speaking (4%), Russian-speaking (2%), and Korean-speaking (2%).

The methodology for low income and minority population identification is included in Appendix J: Minority and Low Income BART Service Area Census Tracts.

Appendix H: Service Area Maps illustrates the location as of 2010 of the following populations in the BART service area:

- Minority populations predominantly;
- Low income populations predominantly;
- LEP populations who do not speak English or do not speak English at all;
- Spanish-speaking LEP populations;
- Chinese-speaking LEP populations;
- Vietnamese-speaking LEP populations; and
- Korean-speaking LEP populations.

Low Income Population by Home-Origin BART Station

The number and proportion of low income populations by home-origin BART station were assessed for BART's 2008 Station Profile Study. The table below illustrates the home-origin BART stations with the largest percentage of low income customers.* Data is based on weekday usage.

Home-Origin BART Station	% of Low Income Customers*
Powell St	45%
Balboa Park	38%
Richmond	37%
Coliseum / Oakland Airport	37%
Downtown Berkeley	37%
Civic Center	36%
12th St / Oakland City Center	34%
19th St / Oakland	31%
Lake Merritt	31%
Ashby	30%
MacArthur	29%
Fruitvale	28%
Hayward	27%
El Cerrito del Norte	26%
Pittsburg/ Bay Point	26%
Bay Fair	25%

Home-Origin BART Station	% of Low Income Customers*
San Leandro	24%
16th St Mission	24%
24th St Mission	23%
Colma	23%
Daly City	22%
South Hayward	22%

** Note: In this table, "low income" includes those with annual household incomes under $25,000 (regardless of household size) and those with annual household incomes of $25,000 - $49,999 with household sizes of two or more people. In certain cases, this may be a broader definition than the threshold described in Section D (200% of the federal poverty level) where low income is defined as $44,700 for a household size of 4.*

Minority Population by Home-Origin BART Station

The number and proportion of minority populations by home-origin BART station were assessed for BART's 2008 Station Area Profile Study. The table below identifies the 17 home-origin BART stations with the largest percentage of minority customers.* Data is based on weekday usage.

Home-Origin BART Station	% of Minority Customers*
Coliseum / Oakland Airport	82%
South Hayward	79%
Union City	78%
Balboa Park	77%
Richmond	74%
Pittsburg/Bay Point	73%
South San Francisco	73%
Hayward	71%
Fremont	70%
Colma	68%
El Cerrito del Norte	68%
Daly City	67%
Bay Fair	67%
12th Street/Oakland City Center	66%
San Leandro	65%
San Bruno	59%

Home-Origin BART Station	% of Minority Customers*
Lake Merritt	57%

** Note: BART's 2008 Station Area Profile identified 56 percent of the population in its service area as non-white based on U.S. Census Bureau 2006 to 2008 American Community Survey (ACS) 3-Year Sample data.*

Limited-English Proficient Population within BART Service Area

The number and proportion of persons with limited English-speaking proficiency and their language characteristics likely to be encountered within BART's four-county service area were assessed for the LAP. Both the U.S. Census and ACS data sources identify the top six languages spoken by LEP persons in the BART service area as the following: Spanish, Chinese (Cantonese and Mandarin), Vietnamese, Tagalog, Russian and Korean.

Primary Languages Spoken in the BART Service Area, Census 2000		
Language	Population Speaking Non-English Languages	Percent of Total Population
Spanish	517,983	14.24
Chinese	282,398	7.76
Tagalog	141,341	3.88
Vietnamese	37,785	1.04
Russian	28,993	0.80
All Other Languages	332,738	9.14
Total Speaking Non-English Languages	**1,341,238**	**36.86**

Source: U.S. Census Bureau, Summary File 3 (SF 3), 2000, Table PCT.10

F. Definitions

To ensure consistent use of terminology in the PPP, the following definitions are provided.

- *Community Partners:* Any organization or group that desires to work with BART to help facilitate participation by their members in a BART-sponsored participation strategy method. Community partners are also stakeholders and play a critical role in helping to reach target audiences.

- *Language Assistance Plan (LAP):* A tailored plan that describes BART's self assessment which identifies appropriate language assistance measures needed to improve access to BART services and benefits from limited English proficient persons.

- *Limited English Proficient (LEP) population:* Those persons who reported to the U.S. Census Bureau that they do not speak English well or who do not speak English at all.

- *Outreach:* An effort by individuals in an organization or group to share its ideas or practices, to educate or inform, and to engage and seek input from other organizations, groups, specific audiences or the general public.

- *Outreach Methods:* Methods that identify and invite target audiences and stakeholders to participate in a public participation opportunity.

- *Public Information:* A one-way communication from BART to the public with the goal of providing clear and objective information about a policy, project, program or activity.

- *Public Input:* Participation methods that seek community feedback on a policy, project, program or activity. A response is required from the public.

- *Public Participation:* Any process that seeks to inform, collect input from or involve the public in decision-making processes. Public participation is an umbrella term that describes methods including: public information, education, outreach, input, involvement, collaboration and engagement, and communication from the public to BART.

- *Public Participation Plan (PPP):* A tailored plan that describes how BART may undertake public involvement, information, education, participation and/or outreach methods.

- *Public Participation Strategy:* A specific program of participation methods tailored to meet the participation needs and preferences of a specific geographic area or cultural group. The public participation strategy is informed by BART's overall PPP, as defined above, but is adapted for that geographic area, specific group and/or issue at hand.

- *Public Relations:* The dissemination of information to the media and the public with an emphasis on the promotion of a particular policy, program, project or activity.

- *Target Audience and Participants:* Low income, minority and Limited English Proficiency (LEP) populations.

- *Government and Community Relations (GCR):* BART's Government and Community Relations Department serves as a direct liaison to the community and local, state and federal elected officials and their staff representing the San Francisco Bay Area on all issues related to BART.

- *Office of Civil Rights (OCR):* BART's Office of Civil Rights oversees and monitors BART's Civil Rights compliance ensuring all BART policies, practices and procedures are free from discrimination, harassment and retaliation and to coordinate BART's Title VI compliance.

II. GOALS AND GUIDING PRINCIPLES

A. Goals

The PPP endeavors to offer meaningful opportunities for the public, including low income, minority and limited English proficient populations, to be involved in the identification of social, economic, and environmental impacts of proposed transportation decisions at BART.

Specific goals and outcomes include:

- Quality Input and Participation
  Comments received by BART are useful, relevant and constructive, contributing to better plans, projects, strategies and decisions.

- Consistent Commitment
  BART communicates regularly, develops trust with communities and builds community capacity to provide public input.

- Diversity
  Participants represent a range of socioeconomic, ethnic and cultural perspectives, with representative participants including residents from low income neighborhoods, ethnic communities and residents with limited English proficiency.

- Accessibility
  Every effort is made to ensure that opportunities to participate are physically, geographically, temporally, linguistically and culturally accessible.

- Relevance
  Issues are framed in such a way that the significance and potential effect is understood by participants.

- Participant Satisfaction
  People who take the time to participate feel it is worth the effort to join the discussion and provide feedback.

- Clarity in Potential for Influence
  The process clearly identifies and communicates where and how participants can have influence and direct impact on decision-making.

- Partnerships
  BART develops and maintains partnerships with communities through the methods described in the PPP.

B. Guiding Principles

Effective public participation should be based on the following principles:

- Flexible
  The engagement process should accommodate participation in a variety of ways and be adjusted as needed.

- Inclusive
  BART should proactively reach out and engage low income, minority and LEP populations from the BART service area so these groups will have an opportunity to participate.

- Respectful
  All feedback received should be given careful and respectful consideration.

- Tailored
  BART's public participation methods should be tailored to match local and cultural preferences as much as possible.

- Proactive and Timely
  Participation methods should allow for early involvement and be ongoing and proactive so participants can influence BART's decisions.

- Clear, Focused and Understandable
  Participation methods should have a clear purpose and use for the input, and should be described in language that is easy to understand.

- Trustworthy
  Information provided should be accurate and trustworthy.

- Responsive
  BART should strive to respond and incorporate appropriate public comments into transportation decisions.

- Transparent in Impact
  BART should communicate the results of the public's input in terms of the impact on decisions at a broad summary level, providing the major themes, the decisions reached and rationale for the decisions.

- Authentic and Meaningful
  BART should support public participation as a dynamic and meaningful activity that requires teamwork and commitment at all levels of the organization.

III. PUBLIC PARTICIPATION STRATEGY DESIGN FACTORS

A. Introduction

The following factors will guide BART in designing an appropriate public participation strategy and determining which methods should be employed in relation to transportation decisions which include major service changes, fare changes or construction projects. Strategies should be scaled in intensity, duration, number and frequency of methods used, with consideration of the following:

- Scale of plan or project (region-wide, county level, neighborhood level)
- Level of potential impact
- Cost of potential decision for BART, taxpayers and customers

The PPP includes methods that are tailored to achieve participation from specific geographic areas or communities and are culturally sensitive and inclusive of low income, minority and LEP populations. FTA guidelines provide BART "wide latitude to determine how, when and how often specific public involvement measures should take place, and what specific measures are most appropriate. Recipients [of federal funds] should make these determinations based on the composition of the population affected by the recipient's action, the type of public involvement process planned by the recipient, and the resources available to the agency."

Project-specific public participation strategy development will take the following into consideration: target populations and needs, partnerships with CBOs, and translation and interpretive services.

B. Target Populations and Needs

To reach low income, minority and LEP populations within BART's service area, a geographically focused public participation strategy will be needed to achieve the desired participation outcomes. BART staff will work with community partners and stakeholders to identify the most effective methods to support participation within a particular area or cultural group. For example, during the PPP development process, participants suggested specific meeting locations, meeting times, community-based organizations and media outlets that work best in their particular area. One community member illustrated the importance of tailoring each public participation strategy specifically to the project and community, asserting "in reaching out to minority and limited English language populations, you have to meet them where they are…to gather and communicate in the way that these various communities are accustomed to doing so. This may mean by unconventional methods."

Public participation outreach methods and strategies will likely vary depending on the nature and location of the project. For example, participants in PPP development

activities suggested a number of public participation methods other than traditional community meetings, such as: walking tours of specific stations conducted by BART Directors or staff; development of a "roadshow" with representatives staffing tables at community events such as fairs and festivals and locations such as malls, local supermarkets and BART parking lots; making suggestion boxes or comment cards, surveys on kiosks, or even a BART representative available at stations in order to gather feedback; surveying riders on BART regarding their needs; and sending representatives to city council and other regularly-scheduled community governmental meetings on a regular basis.

C. Partnerships with Community-Based Organizations (CBOs)

Based on past experience, BART finds that strong partnerships result in more participation, better meeting locations and better meetings overall. The CBOs provide a bridge between BART and the community, which helps to build and deepen trust. For example, the Lao Family Development Center in central East Oakland hosted a PPP meeting with BART and their locally-elected representative from the BART Board. The Center's outreach methods helped attract over 200 center members to participate in a community meeting.

CBOs can be helpful in clarifying the best outreach strategies for their constituent community. For example, Russian American Community Services noted that their Russian community members tend to have internet access and prefer to receive information online.

CBOs that serve persons from multi-lingual/multi-cultural groups have been helpful in hosting meetings that ensure participation by low income, minority and LEP populations. Methods at these locations can be both targeted and open to the public. The Native American Intertribal Friendship House located in Oakland is an example of one such location.

BART will continue to communicate with partner CBOs and take advantage of CBOs' ability to support BART public participation methods. However, care should be taken to consider the most strategic and targeted use of CBOs' resources so as to avoid placing an undue burden on the same organizations.

D. Translation and Interpretive Services

BART staff will work with CBOs to identify the specific language services that community members may expect to be provided. When BART is hosting public meetings in a particular geographic area with a known, significant LEP population, the following should be done:

1. Meeting notices should be produced and distributed according to the language translation threshold in the LAP[2], encouraging community members to participate. In addition, participants can request interpreter services 48 hours in advance of the meeting, if needed; and
2. BART will provide at least one qualified interpreter at these meetings who is fluent in the designated LEP language(s).

PPP Survey Results and Community Input

Community input in the form of comments received during the PPP process indicated that LEP PPP development participants support translation and interpretive services when possible to encourage their participation in BART-related public participation methods. PPP development survey results indicated the following population-specific findings regarding translation and interpretive services:

- More than 50% of PPP survey respondents were LEP. Among LEP survey respondents, some LEP language groups had stronger preferences for the presence of an interpreter at meetings than other language groups:
  - 63% of 193 Spanish-speaking PPP survey respondents
  - 69% of 67 Chinese-speaking PPP survey respondents
  - 77% of 320 Vietnamese-speaking PPP survey respondents
- 56% of 193 Spanish-speaking PPP survey respondents preferred having translated written material available at community meetings.

Targeted translation and interpretive services outlined in the LAP inform the PPP's targeted public participation methods. LAP translations and interpretation requirements and services are described at length in the LAP.

Vital Documents

BART will take reasonable steps to ensure that LEP persons receive the language assistance services necessary by translating "vital" written materials into the Language Translation Threshold in the LAP.

Vital documents are defined either as (1) any document that is critical for obtaining services and benefits, and/or (2) any document that is required by law. The "vital" nature of a document depends on the importance of the information or service involved, particularly the consequence to the LEP person if the information is neither accurate nor timely.

The designation of a document as "vital" may not mean that a word-for-word translation of that document will be required. In some cases, a vital document may be

[2] The language translation threshold consists of a minimum of four languages (Chinese, Spanish, Vietnamese and Korean), with the possibility of up to twenty-two additional languages, depending on the circumstances (the "Language Translation Threshold").

translated by providing a summary of the key information in the document. In other cases, notice of the availability of language assistance services may be sufficient.

IV. PUBLIC PARTICIPATION METHODS

A. Introduction

BART will be successful in reaching out to low income, minority and LEP populations by utilizing a variety of methods to provide information, invite participation and seek input. Regardless of the method, BART will select the most appropriate and feasible methods to support each public participation activity from the methods suggested by participants in the process of developing the PPP and determined by the LAP. Care should be taken to ensure that the selected methods are implemented in a manner that specifically targets the participation of low income, minority and LEP populations as well as the general public. It should also be noted that there is no "golden rule" as far as the preferences of any given population are concerned, so circumstances influencing participants affected by a particular project, as well as other factors such as geographic location, need to be considered.

B. Methods Suggested by Target Populations

I. Methods and Considerations for Enhancing Participation from Low Income Populations

The majority of PPP survey respondents were identified as low income, with an annual household income (before taxes) of less than $40,000. Of 1,140 respondents who answered the question regarding income, 890, or 78% of all respondents, were low income. In addition, input from CBOs serving low income populations was also solicited at focus group meetings held in April 2010. Following is a summary of methods suggested by CBOs or low income participants for enhancing participation from low income populations.

1a. Meeting Considerations

Focus group and survey respondents suggested that meeting organizers carefully consider meeting location and time in order to enhance participation from low income communities. Many low income participants were concerned with transportation to and from BART meetings. Some participants asked that BART "coordinate meeting times with transit schedules," ensuring that evening meetings occur "before the last bus" leaves. The vast majority of low income PPP survey respondents (65% or 488 respondents) also indicated a preference for weekend meetings over weeknight evenings or during business hours. Other participants asked that meetings be held in accessible meeting locations, near or even at a BART station, or that free transportation from BART to/from a meeting location be offered. One participant explained that many "can't budget the extra trips." Another participant also suggested that BART consider "pay[ing] for focus groups," offering some compensation to public participants who provide feedback on BART decisions. Finally, a few meeting participants asked that meeting organizers carefully consider the safety of a meeting location, requesting that meetings be located in an area considered "safe for all of us."

Another significant group of comments related to meeting amenities. Refreshments and childcare were ranked as among the top considerations that most low income respondents identified as "very important" or "somewhat important" in their decision to attend a meeting.

1b. Methods for Publicizing Participation Opportunities

Both low income meeting participants and survey respondents suggested that publicity at BART stations or trains would be one of the more effective methods for publicizing participation opportunities to low income populations. Survey respondents also suggested direct mail as an effective method. At a focus group meeting hosted by BOSS (Building Opportunities for Self-Sufficiency), an organization that serves low income populations, advocates from BOSS and other CBOs noted that BART seat drops were one of the more effective outreach methods. Other effective notification methods that were cited included flyers at turnstiles and advertisements on BART trains. Many participants also suggested that BART consider publicizing opportunities on local buses or at local bus stops.

Also, like most survey respondents, low income respondents ranked receiving information on public participation opportunities via "postcard or letter in the mail" as the preferred notification method (when compared to newspaper ads, announcements made through a CBO, BART's website, email, or telephone). However, if meetings were to be publicized through newspapers, low income participants suggested that BART use free neighborhood weekly newspapers because many consider them to be the best source of information and events in local areas. Finally, some CBOs suggested that BART publicize participation opportunities through social service agencies that serve low income populations. For example, BART could explore adding publicity to the monthly rent notices sent out by local housing agencies. A large number of PPP survey respondents (65% of 756 respondents) also indicated involvement with religiously-affiliated CBOs, as contrasted with 5%-13% indicating involvement with other types of CBOs. They also suggested CBOs that specifically serve low income communities. Therefore, these organizations may be helpful in suggesting effective outreach methods for any low income communities they may serve.

1c. Other Considerations

Many of the survey respondents among PPP development participants who were identified as low income also identified themselves as LEP. Among PPP survey respondents, the majority (78%) of low income participants were also LEP, and 84% ranked the availability of translation services as "very important" or "somewhat important" factors in their decision to attend a meeting. Because of this, public participation methods targeted towards low income populations may also need to consider the translation/interpretation needs of LEP populations. Also, a number of low income and/or LEP participants were illiterate and depended on CBOs to help them learn about topics and issues of interest, as well as to help them fill out sign-in sheets

and surveys at meetings, so methods targeted toward both these populations may need to take this into consideration as well.

II. Methods and Considerations for Enhancing Participation from LEP Populations

Well over half of PPP survey respondents were identified as LEP. Of 1,227 respondents who answered the question regarding the language they prefer to communicate in, 774, or 63% of all respondents, were LEP. In addition, input from CBOs serving LEP populations was also solicited at focus group meetings held in April 2010. The availability of interpreters at meetings and translated outreach materials is crucial to enhancing participation from LEP populations. Following is a summary of additional methods suggested by CBOs or LEP participants.

2a. Meeting Considerations

As with low income participants, focus group and survey respondents suggested that meeting organizers carefully consider meeting location, time and accessibility in order to enhance participation from LEP communities. However, since many LEP participants are not low income, they had additional suggestions as well. Some LEP participants echoed the same concerns with convenient transportation to and from BART meetings that were voiced by low income participants. Others clearly had their own transportation, but asked that meeting locations have "better parking." In addition, several LEP participants suggested that meetings have a live online video feed so that those who cannot conveniently travel to the meeting location could still participate.

Preferences for meeting time varied between different LEP populations. While Vietnamese (94% of 401) and Chinese (56% of 66) PPP survey respondents indicated a preference for weekend meetings over weeknight evenings or during business hours, Spanish PPP survey respondents (61% of 188 respondents) preferred weeknight evenings. This suggests that preferences for meeting time may be influenced by income and other factors in addition to the language spoken. Therefore, outreach efforts targeted toward LEP populations need to clarify the preferences of the specific group.

As with low income PPP survey respondents, refreshments and childcare were ranked as among the top considerations that most LEP respondents identified as "very important" or "somewhat important" in their decision to attend a meeting.

2b. Methods for Publicizing Participation Opportunities

LEP meeting participants and survey respondents, like low income participants, also suggested that publicity at BART stations or trains would be one of the more effective methods for publicizing participation opportunities to LEP populations.

LEP survey respondents also ranked receiving information on public participation opportunities via "postcard or letter in the mail" as the preferred notification method. However, LEP participants were also much more likely to suggest using ethnic media

sources and online notices to publicize meetings. Since a number of LEP meeting participants were illiterate, outreach methods that do not depend on reading, such as announcements on ethnic TV or radio stations or through CBOs, may be considered. At a meeting hosted by the Lao Family Development Center in central East Oakland, several participants suggested that phone calls in Nepalese would be most effective.

Like low income survey respondents, a much larger number of PPP survey respondents indicated involvement with religiously-affiliated CBOs rather than with other types of CBOs. They also suggested CBOs serving particular neighborhoods with a high population of LEP persons. Therefore, these organizations may be helpful in suggesting effective outreach methods for any LEP communities they may serve.

III. Methods and Considerations for Enhancing Participation from Minority Populations

The majority of meeting participants and PPP survey respondents were low income and/or LEP, but there was also significant participation from minority community members who were English-speaking and came from a variety of economic situations. At most of the focus group meetings where minority populations were predominant, including meetings in Richmond, in the San Francisco Tenderloin, at Pittsburg High School, and at the San Leandro Library, participants recommended ethnic media as one of the best methods to reach out to the public. In addition, minority participants and survey respondents suggested doing outreach at community events and through neighborhood notices, such as postings on store windows. Many participants also stressed the importance of developing a long-term relationship with community organizations that serve minorities. Some suggested that developing a community advisory committee would be the most effective means of creating such a relationship. This theme was emphasized in meetings at the South Berkeley Senior Center and the El Cerrito Community Center, in the San Francisco Mission District, and in West Oakland.

Minority PPP survey respondents had a much greater likelihood of being involved in a variety of types of CBOs including political, environmental, regional or urban planning as well as religiously-affiliated CBOs. In addition to those specifically serving minorities, the most common factor was geographic. CBOs suggested by minority meeting participants often served a particular neighborhood or region with a large minority population.

C. Menu of Public Participation Methods

The following menu of methods includes those used to inform (Public Information), reach out and invite participation (Outreach), and those to seek input (Public Input). The menu identifies how each method could best be used and is based on input collected from the community and BART staff experience. The methods are not listed in priority order, and are summarized in a matrix on page 35.

Population-specific findings from surveys conducted during the PPP development process are excerpted throughout this section; the complete data can be found in Appendix A: Population-Specific Findings from PPP Development Process Surveys. In analyzing these findings, the following definitions were used to determine low income, minority or LEP status:

- PPP survey respondents were considered to be low income if they replied to the question, "What is the total annual income of your household before taxes?" by indicating that they have an annual household income (before taxes) of less than $25,000.
- PPP survey respondents were considered to be minority if they responded to the question "What is your race or ethnic identification?" by indicating any race or ethnic identifications other than "White."
- PPP survey respondents were considered to be LEP if they responded to the question, "In which language do you prefer to communicate?" by indicating any language other than English.

1. Printed Materials Produced by BART

(Public information and outreach)

Outreach information can be publicized in print materials produced by BART such as newsletters, flyers and posters. BART newsletters include the monthly BART Times and the quarterly Fleet of the Future newsletter. BART flyers include periodic one-page Passenger Bulletins distributed at fare gates and in trains. Per the LAP, vital information in printed materials must be translated into Spanish, Chinese, Vietnamese and Korean and, potentially, into additional languages as needed. If all information cannot be translated, notices could offer translated tags, describing where to obtain translation/interpretations. LEP survey participants indicated in significant percentages a preference for translated information.

Many participants noted that the most effective notification method is the distribution of flyers/notices on or at BART trains and stations. Based on its experience, BART has also found that notices and flyers can also be effectively distributed through community partners.

PPP Community Input – Printed Materials Produced by BART

A PPP development participant emphasized the effectiveness of flyers to reach communities: "Too many of these questions assume the people who [they] are trying to reach can use the Internet. Most do not. They even have a hard time seeing a newspaper. Use TV and flyers." Community members recommended locations such as the bulletin board at local branch libraries, YMCAs, supermarkets and coffee shops.

2. Printed Materials Produced by Other Organizations

(Public information and outreach)

Coordinating with community partners can be cost-effective and can help partner organizations provide information that is of interest to the groups they represent. Information can be publicized in local and regional community newsletters, church bulletins, flyers and other publications.

2a. Local Service Providers

Local service providers regularly communicate with community members through their newsletters to provide information about local services and activities of interest. For example, Housing Authorities communicate regularly with the community they serve through rent notices. Other service providers identified by community members included: emergency food and housing centers, daytime drop-in service providers, food banks, travelers' aid groups, veterans organizations and drop-in service providers.

2b. Local Schools, Community Colleges and Universities

BART may be able to reach parents of school children by coordinating with local schools. Notices and flyers can be provided to the school, with students taking the notices home to their parents. BART may also provide translated materials as recommended by school officials. Community members who were parents or guardians of school-age children identified this as an effective method for getting information to them. Community members also suggested local universities and community colleges in order to get information to college-age students and their families.

3. BART Website

(Public information, outreach and public input)

The BART website, www.bart.gov, is a communications tool that provides substantial information about BART policies, strategies, plans and methods. BART's website offers the BART Rider Guide translated into Chinese, Spanish, Japanese, Korean, German, French and Italian (http://www.bart.gov/guide/index.aspx). BART also uses social networking applications such as Facebook and Twitter.

It should be noted that many community members have cell phones that can receive text messages, but not necessarily smart phones with internet service. Text messages may be a more effective means of sharing BART information than smart phone applications.

Many community members are not aware of the volume of information available on the BART website. Informing community members of what is available on the website is an important element of public outreach, especially outreach to LEP populations.

There were many comments from participants requesting more translated information on the BART website; for example, one Chinese-speaking LEP participant requested that BART "email in Chinese" or "use the web" because "30-40% of [LEP Chinese] use

the web. However, there was also a large number of low income, minority and LEP participants and survey respondents who do not have convenient access to the internet. Therefore BART should ensure that information and participation methods available on the website are available in alternative locations and formats so that users without access to or who prefer not to use the internet can participate. CBOs can be helpful in identifying their constituent communities' communications preferences.

4. Webcast Meetings

(Public information, outreach and public input)

BART, in venues with high-speed web-access, can webcast meetings and public participation methods to allow remote viewing and participation. Informational materials and videos can be posted online for advance review. Webcast meetings may include opportunities for web participants to ask questions or make comments through email or other web-based applications. BART currently webcasts BART Board meetings in English and is exploring the webcasting of meetings in multiple languages.

5. Postcards and Letters Distributed by Mail

(Public information, outreach and public input)

Participation methods can be publicized by letter or postcard distributed by mail. While it is costly for BART to contact all interested persons by mail (regardless of their communications preference), it can be the most effective method for reaching a specific geographic area or population group. For example, sending a postcard in English, Spanish, Chinese, Vietnamese and/or Korean to promote a participation activity may be an effective and cost efficient manner to reach members of a specific community who may be directly impacted by a specific activity.

PPP Survey Results and Community Input – Postcards and Letters Distributed by Mail

Comments made by community members throughout the PPP development process emphasized the effectiveness of direct mailings to publicize participation opportunities. Survey results received during the PPP process indicated population-specific findings regarding the use of postcards and letters distributed by mail to publicize participation opportunities.

- Receiving a postcard or letter by mail was by far the most popular method for publicizing participation opportunities among low income, LEP and minority PPP survey respondents, as follows:
    - 54% of 727 low income PPP survey respondents
    - 44% of 98 American Indian or Native PPP survey respondents
    - 61% of 551 Asian or Pacific Islander PPP survey respondents
    - 39% of 222 Spanish, Hispanic or Latino PPP survey respondents
    - 43% of 187 Spanish-speaking PPP survey respondents
    - 59% of 66 Chinese-speaking PPP survey respondents
    - 64% of 410 Vietnamese-speaking PPP survey respondents

- Although this represents less than a majority (50% or more) of respondents in several cases, that was more than twice the number of those who preferred any of the other options given.
- Black/African American PPP survey respondents preferred receiving emails to other methods. Although only 41% of 59 respondents chose receiving emails as their preference, that was more than twice the number of those who preferred any of the other options given.

6. Station Information Resources

(Public information and outreach)

Many community members expect BART stations to provide information about BART public participation methods, beyond basic fare and schedule information. Using station information resources allows BART users to stay up to date on BART public participation methods while they wait for their train. Providing this information in multiple languages assists those with limited English proficiency. BART currently provides multilingual brochures in Spanish, Chinese, Vietnamese and Korean on such subjects as safety guidelines and evacuation procedures.

Information resources located in BART stations that are used to communicate schedule and service information can be used to conduct outreach. The Destination Sign System (also referred to by community members as electronic information signs) can provide important information combined with train and other community announcements. BART newsletters, bulletin boards, information kiosks and other information stations should also be used to promote participation opportunities.

7. Media Targeted to Ethnic Communities

(Public information and outreach)

Participation opportunities can be publicized through radio, television and newspapers that serve both English speaking and language-specific audiences, including Spanish, Chinese, Vietnamese and Korean.

Some local news or radio shows and local publications, such as free neighborhood weekly papers, are considered to be good sources of information and events in the immediate area. BART should tailor its message to the appropriate audience and remind participants that they can contact BART and receive information in their preferred language. BART should continue outreach to numerous media outlets in the Bay Area that are targeted or appeal to ethnic communities. A listing of media outlets is attached as Appendix C: BART Media Outlets.

PPP Survey Results and Community Input – Media Targeted to Ethnic Communities

Survey results and community input received during the PPP process indicate that the majority of minority and LEP community members are likely to learn about BART-related methods through ethnic media such as television, radio and newspapers.

BART could continue and expand advertising and outreach to local and ethnic media sources, including TV public service announcements, radio, print and web-based outlets. Community participants also suggested that in-person appearances by BART staff or Directors on local media outlets would be particularly effective. Specific media outlet suggestions are compiled in Appendix C and designated by population, language, and/or geographic group. These suggestions will be used to inform future participation strategies.

8. Coordination with Community Events

(Public information, outreach and public input)

In cooperation with community organizations, BART should continue its current practice of hosting information tables that provide materials about BART service and outreach methods at community events and activities. These events can range in scale from large city-wide events to localized activities. CBO representatives and community members recommended that outreach be conducted in locations where people already gather, for instance, at community events such as fairs and festivals. Most community events can help BART reach specific audiences such as seniors, youth, families with children, commuters and others. Community members suggested that BART use assistance from bi-lingual community partners to ensure that LEP persons receive adequate and accurate information in their language.

Community Input – Coordination with Community Events

Community input in the form of comments received during the PPP process indicated that low income, minority and LEP participants supported BART's efforts to coordinate public participation methods with community events. PPP participants suggested the following specific events for future BART coordination: the El Sobrante Stroll, El Cerrito 4th of July, Solano Stroll in Albany, the El Cerrito Farmers Market, the San Mateo County Fair, Cinco de Mayo, and soccer games hosted by the Liga Latina Soccer League in Concord.

9. Coordination with Other Agencies

(Public information and outreach)

BART may develop partnerships with agencies that regularly communicate with local residents. BART could identify agencies in the project area by considering who serves the population and where they convene. BART may consider the following types of agencies to comprehensively reach low income, minority and LEP populations: faith-based, geographic-specific such as tenant associations, neighborhood and community, education, social services, recreation, environmental, political, youth- and senior-oriented organizations.

BART can work with these partners to provide information about public participation opportunities, included in notices and regular mailings sent by these agencies.

10. Government Meetings

(Public information and outreach)

BART can continue to provide updates on its plans and projects to federal, state and local elected officials through regularly scheduled government meetings. BART regularly sends letters and emails that summarize decisions and potential decisions. BART will need to contact these entities in advance to ensure they are on the agenda and that any helpful information can be included in the meeting packet.

11. Regular Meetings of Civic and Community Organizations

(Public information, outreach and public input)

BART can provide updates on its policies, projects, strategies and methods by participating periodically in scheduled meetings of local civic and community organizations. These gatherings provide an opportunity to make a presentation and answer questions. Depending on the meeting format, BART may also be able to solicit public input at these meetings.

12. Public Participation at BART Board Meetings

(Public information, outreach and public input)

Currently, to comment at a meeting of the BART Board of Directors, a participant must complete and submit a speaker card. Individuals are then called on in the order the speaker cards were received and are allowed to speak for a limited amount of time, usually 2-3 minutes.

BART will continue its current public participation rules, which help the Board manage the high level of participation that often occurs at BART meetings.

13. Participation by BART Directors

(Public information, outreach and public input)

Community members expressed a desire to see their local BART Directors take a more active role in all public participation methods. Community members also asked for a report of BART Director activities in their Districts as a part of each Board meeting.

Currently, calls and emails to a Director all go to one centralized phone number and email address. Some participants expressed a desire to reach their elected representative directly, similar to the way they can reach their supervisor or council person. BART staff could work with the Directors to enhance direct communication.

BART Directors could continue their efforts to attend as many public participation methods as possible and be available to communicate with residents. Community members want BART Directors to be kept fully informed of the results of public participation methods. BART staff may summarize the issues discussed and the results of public participation methods and share the information with the BART Board and the public.

14. Community Meetings

(Public information, outreach and public input)

Community members have a variety of preferences for public input opportunities at community meetings. Meeting formats should be tailored to help achieve specific public participation goals. Some meetings are designed to share information and answer questions. Others are designed to engage the public in providing input, establishing priorities and helping to achieve consensus on a specific recommendation. It is important to create an agenda that works to achieve BART's goals but is relevant to and not overwhelming for the public.

For all meetings, the venue should be a facility that is fully accessible for persons with disabilities and, preferably, is served by public transit. The venue should be a location that is familiar and comfortable for the target audience. If a series of meetings are scheduled on a topic, BART may consider different meeting locations, since no one location is usually convenient to all participants.

14a. Community Meeting Formats

i. Open House

(Public information, outreach and public input)

This format provides opportunities for participants to receive information at their own pace by visiting a series of information stations that may include table top displays, maps, photographs, visualizations and other tools. Individual questions are responded to by staff and technical experts. Some open houses include a short educational presentation and comment period at a designated time. Participants are often given comment cards so they can provide written comments. Staff may be assigned to take verbal comments and transcribe them to provide a written record. The Open House Format can be effective when BART is seeking to introduce a new concept or when a lengthy process has been finalized and BART is sharing the final results.

ii. Workshops

(Public information, outreach and public input)

Workshops feature an educational presentation designed to orient participants to the issue being discussed. Workshops often include break-out or discussion groups, where participants have the opportunity to discuss topics in small groups. Participants can share their feedback orally during the small group discussion and in writing on comment cards.

Workshops include the use of tools that promote interaction and may include: electronic or show-of-hands polling, mapping exercises, discussion questions, priority setting methods and other techniques to promote dialogue and discussion.

iii. Large Group Discussion

(Public information, outreach and public input)

These meetings are usually focused on a specific topic and feature an informational presentation followed by a comment period. The comment period can be formal or informal depending on the number of participants and the meeting venue. Individual comments are often limited to 2-3 minutes, especially when there are a large number of people wanting to comment. This format can also include some interactive techniques suitable for a large group such as electronic or show of hands polling or short questionnaires or surveys.

PPP Survey Results and Community Input – Community Meeting Formats

Survey results received during the PPP process indicated population-specific findings regarding community meeting formats. Note that this data is not meant to indicate that only the method receiving the largest number of votes should be used in isolation – a variety of methods is important.

Participants in the PPP development process were given a list of input methods and asked to select one or more of the methods that they thought would help them express their views at meetings. The most popular methods among PPP survey respondents for expressing their views at community meetings were as follows:

- Low income (57% of 756 respondents), Asian or Pacific Islander (65% of 575 respondents), Spanish, Hispanic or Latino (58% of 230 respondents), Spanish-speaking (63% of 193 respondents), Chinese-speaking (69% of 67 respondents), and Vietnamese-speaking (77% of 413) PPP survey respondents indicated that they preferred to express their views through having a translator present at community meetings.
- Spanish-speaking (63% of 193) PPP survey respondents also preferred to use written translated material at community meetings.
- American Indian or Native (51% of 101) PPP survey respondents preferred large group discussions to express their views at community meetings.
- Black/African American (52% of 64) PPP survey respondents preferred small group discussions to express their views at community meetings.
- Electronic voting was the least preferred method of expressing views at community meetings for low income and LEP PPP survey respondents, as follows:
    - 4% of 756 low income PPP survey respondents
    - 5% of 193 Spanish-speaking PPP survey respondents
    - 6% of 67 Chinese-speaking PPP survey respondents
    - 2% of 413 Vietnamese-speaking PPP survey respondents

- A low income PPP development participant emphasized the importance of weighing all input, including community comments and surveys. He stated, "My main concern with voting methods such as electronic or voting by hand at public meetings is being forced to choose options that no one agrees with. There should always be the option for people to express alternatives, or not agree with any proposals presented."

Participants in the PPP development process were also asked to select one or more preferences from a list of methods for having detailed materials presented to them for a meeting. The most popular methods among PPP survey respondents for having detailed materials presented to them for a meeting were as follows:

- Spanish-speaking (58% of 193 respondents), American Indian or Native (53% of 101 respondents), Black/African American (53% of 64 respondents), and Spanish, Hispanic or Latino (57% of 230 PPP survey respondents indicated that they preferred to have detailed information presented to them at community meetings via a live presentation.
- Vietnamese (59% of 413) PPP survey respondents preferred to review information online before a community meeting.

14b. Community Meeting Considerations

i. Scheduling

BART staff could coordinate the scheduling of community meetings with community partners to minimize conflicts. However, some scheduling conflicts may be unavoidable when a public participation activity is urgent or linked to a time-sensitive topic.

ii. Meeting Locations

Convenient and comfortable meeting locations are key to soliciting active public participation, particularly in low income, minority and LEP communities. BART can host meetings in venues recommended by community members who understand their community dynamics best.

Community members identified locations specific to their area including the local branch libraries, YMCA, local school or community college, churches and many others. It is important that meetings are held in different venues since it is unlikely that no one location is ideal for all community members. Meeting locations can be rotated to ensure access for as many community members as possible. Community partners should be reminded that regardless of the popularity or convenience of a venue, BART is required to conduct all public participation methods in locations that are fully accessible to persons with disabilities and, preferably, the venues should be served by public transit.

iii. Meeting Times

A convenient meeting time is important to low income, minority and LEP survey participants. Public participation methods can be scheduled at varying times of day and on different days of the week Survey data indicates that the majority of community members prefer meetings to be held on weekends. Weeknights after traditional work hours are also acceptable. Fewer community members can participate during the workday; however, seniors are more likely to attend daytime activities scheduled during the week.

PPP Survey Results and Community Input – Meeting Times

Survey results received during the PPP process indicated distinct population-specific preferences regarding meeting times among PPP survey respondents, as follows:

- Low income (65% of 746 respondents), Asian or Pacific Islander (80% of 470 respondents), Chinese-speaking (56% of 66 respondents), and Vietnamese-speaking (94% of 411) PPP survey respondents prefer meetings to be held on weekends.
- Spanish-speaking (61% of 188 respondents), American Indian or Native (51% of 100 respondents) Black/African American (72% of 64 respondents) and Spanish, Hispanic or Latino (61% of 225) PPP survey respondents prefer weeknight meetings.

iv. Number of Meetings

Some transportation decisions require more meetings than others. BART has held anywhere from two to more than twenty meetings for system-wide decisions. For decisions that affect one or two existing stations, BART has held anywhere from one to three meetings. The number of meetings will depend on the project.

v. Childcare and Refreshments

Many adults with childcare responsibilities can only participate if childcare is provided. Childcare services can be available on-site and provided by a community partner staff or volunteers who are screened to work with youth and have appropriate training. Bi-lingual childcare providers may also be needed, depending on community interpretation needs. BART will need to receive requests for childcare at least 72 hours in advance. Community members suggested that many community members are more likely to attend if refreshments are provided, especially if the meeting is held close to meal time.

PPP Survey Results – Childcare and Refreshments

Survey results received during the PPP process indicate the following population-specific findings regarding childcare and refreshments being provided at meetings:

- Childcare was identified as a "very important" or "somewhat important" factor in their decision to attend a BART-related meeting by low income, minority and LEP PPP survey respondents, as follows:
  - 82% of 331 low income PPP survey respondents
  - 76% of 89 American Indian or Native PPP survey respondents
  - 67% of 163 Asian or Pacific Islander PPP survey respondents
  - 67% of 55 Black/African American PPP survey respondents
  - 89% of 205 Spanish, Hispanic or Latino PPP survey respondents
  - 94% of 168 Spanish-speaking PPP survey respondents
  - 85% of 33 Chinese-speaking PPP survey respondents
  - 68% of 59 Vietnamese-speaking PPP survey respondents
- Refreshments being provided at meetings was identified as a "very important" or "somewhat important" factor in their decision to attend a BART-related meeting by low income, minority and PPP survey respondents, as follows:
  - 92% of 676 low income PPP survey respondents
  - 87% of 90 American Indian or Native PPP survey respondents
  - 92% of 508 Asian or Pacific Islander PPP survey respondents
  - 73% of 55 Black/African American PPP survey respondents
  - 86% of 199 Spanish, Hispanic or Latino PPP survey respondents
  - 86% of 162 Spanish-speaking PPP survey respondents
  - 84% of 60 Chinese-speaking PPP survey respondents
  - 96% of 365 Vietnamese-speaking PPP survey respondents

15. Focus Groups

(Public information, outreach and public input)

BART will continue to host discussion groups held with small, targeted groups of participants. Focus groups can provide in-depth information about projects, plans or issues that may impact a specific group or community. These groups can be both formal and informal and can be conducted in a specific language. BART will proactively include low income, minority and LEP communities.

PPP Survey Results and Community Input – Focus Groups

Many participants expressed discomfort with large meeting formats. Survey results received during the PPP process indicate the following population-specific findings regarding focus groups:

- Focus groups were identified as one of the best methods other than a community meeting to provide input to BART by low income, minority and LEP PPP survey respondents as follows:
    - 86% of 329 low income PPP survey respondents
    - 50% of 101 American Indian or Native PPP survey respondents
    - 88% of 191 Asian or Pacific Islander PPP survey respondents
    - 84% of 51 Black/African American PPP survey respondents
    - 92% of 162 Spanish, Hispanic or Latino PPP survey respondents
    - 97% of 128 Spanish-speaking PPP survey respondents
    - 87% of 39 Chinese-speaking PPP survey respondents
    - 95% of 88 Vietnamese-speaking PPP survey respondents

16. Special Events

(Public information, outreach and public input)

BART can develop special events to announce, highlight or kick-off its outreach about a policy, program, project or activity. Events can be region-wide or focus on a specific station or geographic area. An example might be to convene town hall meetings in each Board member's district. Along with providing information and/or collecting input, the events should include something interactive and/or entertaining to attract participation.

17. Walking Tours and On-Site Meetings

(Public information, outreach and public input)

BART can host walking tours and on-site meetings specific to locations that interest the public, in order to highlight an initiative, project or facility. Walking tours can be primarily educational and BART may ask participants to complete a survey or questionnaire during or after the tour. Walking tours may be helpful in helping BART collect community opinion on issues such as station improvements and proposed extensions. BART can work with community partners to host language specific meetings. For example; meetings can be held for specific populations in Spanish-only, Chinese-only, Vietnamese-only and Korean-only.

18. Key Person Interviews

(Public information, outreach and public input)

BART staff and Directors could continue to meet individually with community leaders and stakeholders to exchange information and gain early insight into upcoming outreach and engagement methods. BART will specifically include low income, minority and LEP populations. Interviewees are asked the same set of questions to allow BART to compare responses and identify key themes and issues. BART may contact interviewees throughout the span of a project or activity to keep them engaged in the public participation process.

19. Surveys

(Public information, outreach and public input)

BART may conduct surveys in print, by telephone and online to collect public opinion on specific topics or issues. Web surveys provide general qualitative data, since it is difficult to control who responds. Print surveys can also provide substantial information, but response rates are typically low.

Depending on the data being collected, BART should consider methodologies that provide statistically valid data when possible. BART should also consider strategies for letting people know that surveys are available in multiple languages, so as to increase the response rate from low income, minority and LEP populations.

20. Telephone Information and Comment Line

(Public information, outreach and public input)

All BART Station Agents, BART Police and Call Center Operators have access to Language Line Services (LLS), which is an over-the-phone language interpretation service. The Service allows BART Station Agents to call the LLS number when a customer is unable to speak English. The professionally trained and tested LLS interpreters listen to the customer, analyze the message and accurately convey its original meaning to the BART staff member, then respond to the customer in his/her own language. The LLS offers interpretation in 170 languages.

Non-English speaking attendees at community meetings advocated strongly for future BART messages in more languages. BART could work not only to translate future BART messages into these languages, but also to ensure that it better promotes the services currently available to non-English speakers, such as LLS, to make the system more accessible and user-friendly to all communities. New Language Assistance Services outlined in the LAP aim to increase LEP population access to services and benefits in the BART system.

PPP Survey Results and Community Input – Methods of Providing Input to BART Other than Community Meetings

Participants in the PPP development process were asked to rank various methods of providing input to BART in addition to community meetings by indicating whether they were "very likely," "somewhat likely," or "not likely" to use a particular method.

Survey results indicate the following population-specific findings regarding most preferred input methods:

- Low income (73% of 468 respondents), Asian or Pacific Islander (74% of 322), and Vietnamese-speaking (92% of 205) PPP survey respondents prefer writing a letter to BART in order to provide their input.
- Spanish, Hispanic or Latino (75% of 162 respondents), Spanish-speaking (80% of 128) and Chinese-speaking (73% of 37) PPP survey respondents prefer participating in focus groups in order to provide their input to BART.
- American Indian or Native PPP survey respondents (44% of 101) prefer providing their input to BART via mail-back surveys.
- Black/African American PPP survey respondents (63% of 52) prefer providing their input to BART via online surveys.

However, because all respondents did not necessarily rank all methods, the sample size varies greatly from method to method. Also, in many cases the distinction between preferences is not particularly great. Therefore, a variety of methods for providing input to BART should be made available to community members.

21. Community Advisory Committee on Title VI Compliance

(Public information, outreach and public input)

Several community groups, minority and LEP participants recommended that BART develop a local advisory group to provide advice on public participation methods. BART believes that the creation of a Title VI Community Advisory Committee (CAC) has merit and can consider the feasibility of such a committee, given capacity and availability of resources. Currently, BART supports three community advisory groups: the Business Advisory Committee, Citizens Oversight Committee for the Earthquake Safety Program and the Citizen Review Board of the BART Police Department.

BART Public Participation Plan - Toolbox of Public Participation Methods

Public Participation Method	Printed Materials		BART Website and Social Networking Methods						Postcards and Letters Distributed by Mail			Email		
	Produced by BART	Produced by other organizations	BART website	Information for review online prior to community meeting	Online video for review prior to community meeting	Online discussion	Webcast meetings	Inform Participants after meetings on BART website	Notify of BART public participation opportunities	Report public participation results	Provide input to BART	Notify of BART public participation opportunities	Report public participation results	Provide input to BART
Low income														
Low income	●	●	●	○	○	●	○	○	●	●	●	○	○	●
Minority														
American Indian or Native Alaskan	●	●	–	○	○	○	○	○	●	●	○	○	○	○
Asian or Pacific Islander	●	●	–	●	○	●	○	○	●	●	●	○	○	●
Black or African American	●	●	–	○	○	●	○	○	○	○	●	●	●	●
Spanish, Hispanic or Latino	●	●	–	○	○	●	○	○	●	●	●	○	○	●
Limited English Proficiency														
Spanish-speaking	●	●	–	○	○	●	○	○	●	●	●	○	○	●
Chinese-speaking	●	●	–	○	○	●	○	○	●	●	●	○	○	●
Vietnamese-speaking	●	●	–	●	○	●	○	○	●	●	●	○	○	○
Korean-speaking	●	●	–	–	–	–	○	–	●	●	●	○	○	○
Russian-speaking	●	●	–	–	–	–	○	–	●	●	●	○	○	○
Tagalog-speaking	●	●	–	–	–	–	○	–	●	●	●	○	○	○

Public Participation Method	Media Targeted to Ethnic Communities*			Partnerships with CBOs				Coordination		Participation by BART Directors
	Radio	Newspapers	Television	Religious	Political	Environmental	Urban/Regional Planning	With community events	With other agencies	
Low income										
Low income	●	●	●	●	○	○	○	●	–	●
Minority										
American Indian or Native Alaskan	–	–	–	●	○	○	○	●	–	●
Asian or Pacific Islander	●	●	●	●	○	○	○	●	–	●
Black or African American	–	–	–	●	○	○	○	●	–	●
Spanish, Hispanic or Latino	●	●	●	●	○	○	○	●	–	●
Limited English Proficiency										
Spanish-speaking	●	●	●	●	○	○	○	●	–	●
Chinese-speaking	●	●	●	●	○	○	○	●	–	●
Vietnamese-speaking	●	●	●	●	○	○	○	●	–	●
Korean-speaking	●	●	●	●	○	○	○	●	–	●
Russian-speaking	●	●	●	●	○	○	○	●	–	●
Tagalog-speaking	●	●	●	●	○	○	○	●	–	●

Public Participation Method	Community Meetings											
	Open House		Workshops									
		Table top displays, maps, charts, etc.	Live presentations	Small group discussion	One-on-one discussion	Electronic voting	Written survey	Show-of-hands voting	Large Group Discussion	Special Events	Walking Tours and on-site meetings	Focus Groups
Low income												
Low income	–	○	○	○	○	○	○	○	○	–	–	●
Minority												
American Indian or Native Alaskan	–	○	●	○	○	○	○	○	●	–	–	●
Asian or Pacific Islander	–	○	○	○	○	○	○	○	○	–	–	●
Black or African American	–	○	●	●	○	○	○	○	○	–	–	●
Spanish, Hispanic or Latino	–	○	●	○	○	○	○	○	○	–	–	●
Limited English Proficiency												
Spanish-speaking	–	○	●	○	○	○	○	○	○	–	–	●
Chinese-speaking	–	○	○	○	○	○	○	○	○	–	–	●
Vietnamese-speaking	–	○	○	○	○	○	○	○	○	–	–	●
Korean-speaking	–	○	–	○	–	○	–	–	–	–	–	–
Russian-speaking	–	○	–	○	–	○	–	–	–	–	–	–
Tagalog-speaking	–	○	–	○	–	○	–	–	–	–	–	–

Public Participation Method	Community Meeting Considerations							Surveys		Telephone information and comment line	Community Advisory Committee	Key Person Interviews	Station Information Resources	Government meetings	Regular meetings of civic and community organizations	Public participation at BART Board Meetings
	Available translation services	Translated written materials	Scheduling	Convenient meeting locations	Meeting Times - weekends	Meeting Times - weeknights	Childcare and refreshments	Printed and mail back	Online							
Low income																
Low income	●	○	–	●	●	○	●	●	●	●	●	–	–	–	–	–
Minority																
American Indian or Native Alaskan	○	○	–	●	○	●	●	●	●	○	●	–	–	–	–	–
Asian or Pacific Islander	●	○	–	●	●	○	●	●	●	●	●	–	–	–	–	–
Black or African American	●	○	–	●	○	●	●	–	●	●	●	–	–	–	–	–
Spanish, Hispanic or Latino	●	●	–	●	○	●	●	●	●	●	●	–	–	–	–	–
Limited English Proficiency																
Spanish-speaking	●	●	–	●	○	●	●	●	●	●	●	–	–	–	–	–
Chinese-speaking	●	○	–	●	●	○	●	●	●	●	●	–	–	–	–	–
Vietnamese-speaking	●	○	–	●	●	○	●	●	●	●	●	–	–	–	–	–
Korean-speaking	–	–	–	–	–	–	●	–	–	○	●	–	–	–	–	–
Russian-speaking	–	–	–	–	–	–	●	–	–	○	●	–	–	–	–	–
Tagalog-speaking	–	–	–	–	○	●	●	–	–	○	●	–	–	–	–	–

** Ethnic Media Resources include:*

	Television	Newspaper
Spanish-speaking	Telemundo 18, Univision 14	El Mensajero, El Tecolote
Chinese-speaking	Channels 8 and 26	Sing Tao Daily, World Journal
Vietnamese-speaking	Cable 6, Channel 26	Mo, Thoi Bao, SaiGon Nho
Korean-speaking		Korean Times, Korean Daily Times
Russian-speaking	Channel One Russia	Russkaya Zhizn, New Life, Vzglyad
Tagalog-speaking	Channels 8, 23, 26 and TFC	Philippine News, Philippines Today

Legend

● = Public participation method preferred by PPP development participants

○ = Public participation method not preferred by PPP development participants

– = Public participation method with no strong preference or not discussed by PPP development participants

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D. BART's Ongoing Public Participation Methods

(Public information, outreach and public input)

BART will continue to promote and enhance the use of its ongoing public participation methods to reach out to low income, minority and LEP populations. BART will conduct proactive outreach to expand the reach, inclusivity and effectiveness of these ongoing methods. Many community members participating in the development of this plan are not fully aware of these resources and BART should conduct specific methods to promote their use. Examples of these existing methods include:

- BART website (www.bart.gov)
- BART Facebook page
- BART communications via Twitter
- Regular newsletters distributed through BART stations
- Regular communications with media
- BART Board meetings
- Key person interviews
- Focus groups
- Partnerships with CBOs
- Communication with elected officials
- Press briefings and news releases
- Regular emails to community members
- Participation in community fairs and festivals
- Sponsorship of major community events
- Passenger bulletins in stations
- Mailings to neighbors of stations
- Educational tours and briefings
- Language Line Services (LLS)
- Language interpreters at public meetings
- Written language assistance services

BART is committed to reducing the barriers encountered by LEP persons in accessing its services and benefits, to the extent resources are available. BART will also evaluate how to consolidate its language assistance measures to deliver the most cost-effective services.

V. PUBLIC PARTICIPATION STRATEGY EXAMPLES

During the PPP review process, community members expressed requests for a more tailored public participation strategy for their community or neighborhood.

The following public participation strategy examples can be utilized as guides to develop a project-specific, tailored strategy, once a project is identified as having impacts on low income, minority and LEP communities. The following examples demonstrate the level of specificity BART could provide when developing a public participation strategy at the community level.

The following public participation strategy examples include an example strategy useful for a variety of BART project types and strategies created and implemented utilizing the principles of the PPP for specific BART projects. Each strategy example is detailed to demonstrate how population-appropriate outreach methods can be and were identified and utilized to develop and conduct transportation decision-specific outreach strategies. Each strategy follows basic public participation steps:

- Identify target populations and public participation needs;
- Coordinate internally to identify methods and develop public participation strategy;
- Coordinate with CBO partners;
- Conduct outreach;
- Identify language needs per the LAP;
- Implement public participation strategy; and
- Compile, review and report results.

These strategy examples may be used to guide, rather than prescribe, the development of future targeted outreach strategies.

A. Example of Public Participation Strategy for BART Projects

This example could be adapted for a variety of scenarios such as a construction project, service change or fare increase.

The public participation strategy for the example project would be communicated broadly throughout the BART service area. BART would use its ongoing tools, which are well-established and reach a wide audience. There would also be significant public participation activities focused in the different communities, especially those most impacted by BART's proposal.

At the community level, BART would take the following steps to implement a geographically focused public participation strategy:

Identify Target Populations and Public Participation Needs

- Perform demographic analysis of the population.
- Identify significant populations for targeted outreach.

Coordinate Internally

- Government and Community Relations Department (GCR), Office of Civil Rights (OCR), and the project team determine the most appropriate form of outreach to be meetings and determine the goals and objectives for the meeting.
- Develop a draft public participation strategy.

Coordinate with CBO Partners

- Identify all CBO partners by considering the following in the project area: who serves the population and where they convene.
- Consider the following types of CBOs to comprehensively reach low income, minority and LEP populations within the project area: faith-based, geographic-specific such as tenant associations, neighborhood and community, education, social services, recreation, environmental, political, youth- and senior-oriented organizations.
- Clearly explain the desired outcomes for the different public participation methods such as sharing information, collecting input and setting community priorities.
- Identify the best way to publicize the public participation methods, select meeting dates and venues, and determine translation needs. The community advisors can help BART avoid potential scheduling conflicts and take advantage of existing events where they can easily reach a significant number of community members.
- Identify the recommended participation methods to achieve these outcomes. For example, a CBO may recommend a meeting format that allows small group discussion so that participants have an opportunity to discuss and understand the information being presented. For a construction project, BART might host some on-site informational tours to help community members better understand the impact the project would have on their immediate neighborhood.

Conduct Outreach

- Work to publicize the activities, identify performance measurements and set targets for participation from the area.
- Ensure that flyers, notices and other outreach methods clearly describe the issue and purpose of the meeting or public participation activity.
- Identify a specific number and sequence of public participation methods and clearly communicate how BART decision makers would use the public input.

Identify Language Service Needs

- Identify language interpretation needs, translate outreach documents, and provide language interpretation services at the activity.

Implement Public Participation Strategy

- Implement the methods identified in the public participation strategy.

Compile, Review and Report Results

- Continue to review the participation goals established at the beginning of PPP strategy development and monitor progress and performance.
- Regularly update the community on the status of the issue and identify additional opportunities for community input.
- Make sure the community is aware of key decision-making activities, such as Board meetings, where action would be taken, so community members can see how the decision was made.
- Communicate the results back to the community, providing a record of the number and characteristics of participants and date, time and location of meetings, and describing the rationale for how and why suggestions made through community input were or were not implemented.

B. Specific Project Examples

Specific Project Example 1

This project is a 10-mile extension eastward from the Pittsburg/Bay Point BART Station near Hillcrest Avenue. Construction began in late 2010. Service opening is scheduled for 2015 and will coincide with the completion of the widening of State Highway 4.

In July 2010, BART hosted three meetings to solicit input from East Contra Costa County community members regarding station access, span of service, fare and travel times.

Identify Target Populations and Public Participation Needs

- Performed demographic analysis of the population within the project corridor.
- Identified significant populations for targeted outreach; low income, minority and LEP populations.

Coordinate Internally

- GCR, OCR, and the project team determined the most appropriate form of outreach to be meetings and determined the topics.
- Determined the locations for three meetings to cover the entire corridor based on the demographic analysis and recommendations from community leaders. Meetings were scheduled in the cities of Pittsburg, Antioch and Brentwood.
- Developed public participation strategy.

Coordinate with CBO Partners

- GCR researched and identified the following specific, local organizations through which to conduct targeted outreach to Blacks, Hispanic and Latinos, Asian and Pacific Islanders, low income and Spanish and Chinese language

speaking corridor residents: ALIVE – Futures Explored, Inc. (developmentally disabled community); NAACP, Antioch; Monument Community Partnership, Concord; La Clinica, Pittsburg; West County Toxics Coalition, Dr. Henry Clark (multi-racial, low income); Contra Costa Interfaith Supporting Community Organization (CCISCO); Antioch Church Family; Holy Rosary Church, Antioch; Antioch Christian Center; Community Presbyterian Church, Pittsburg; Immaculate Heart of Mary, Brentwood; and Golden Hills Community Church, Brentwood.

Conduct Outreach

- Meeting agenda produced in English, Spanish and Chinese.
- Created a meeting notice in multiple languages (English, Spanish and Chinese) for conventional mail distribution and circulation at community and civic organizations.
- Mailed multi-lingual meeting notice to a half-mile radius around each meeting location, as follows: Antioch, Nick Rodriguez Community Center, 625 notices mailed; Pittsburg, Pittsburg Senior Center, 1,550 notices mailed; Brentwood, Brentwood Senior Center, 1,200 notices mailed.
- GCR, OCR and Planning drafted a meeting survey instrument which was produced in English, Spanish and Chinese.
- Distributed multi-lingual meeting notices to environmental advocacy groups in the corridor: Transform, Sierra Club, East Bay Bicycle Coalition and Sustainable Contra Costa.
- Posted meeting flyers at Senior Centers, Community Centers, Libraries, City Halls, Pittsburg/Bay Point BART station and on cars at Brentwood and Antioch Park and Ride lots.
- Informed the staffs of the following City, County, State and Federal elected officials of upcoming meetings and asked them to share the information with their constituents: City Councils and Mayors of Pittsburg, Antioch, Oakley, Brentwood; Contra Costa County Supervisors; State Assembly members and Senator; and U.S. Congressional Representatives.
- Contacted local City Managers and Planning Commissioners to inform them of meetings.
- Contacted local transportation planning agency/groups and requested that meeting flyer be distributed among members (CCTA, 511.org, TRANSPLAN).
- Contacted and informed other transit agencies in the corridor (Tri Delta, AC Transit, County Connection).
- Requested all cities, county and chambers of commerce to post the meeting notice on their website.
- Electronically posted meeting notice including: BART website, project page, Facebook and Twitter.
- Advertised meetings in local newspapers including: Contra Costa Times, Antioch Press, Brentwood Press, and El Mundo, among others.

- Utilized an email list/database created through the project to send out meeting notice via email blast.

Identify Language Service Needs

- Spanish language interpretation was requested for one meeting and translation services were provided.

Implement Public Participation Strategy

- Implemented public participation strategy, which included three public meetings.

Compile, Review and Report Results

- Compiled and reviewed results.
- Reported results.

Specific Project Example 2

BART is preparing a station access plan for the Daly City BART station area. The plan focuses on key elements including the bus intermodal facility; bike, pedestrian and station circulation issues related to access and safety; and consideration of possible amenities including wayfinding signage and real time technology. The plan area encompasses a half-mile radius around the station and straddles the southern edge of San Francisco and the northern edge of Daly City.

In Spring 2011, BART hosted two community meetings to solicit input from Daly City and San Francisco community members who live in the study area. The study continues through 2011, with a third meeting planned for Summer 2011. Completed study / final report is anticipated in Fall 2011.

Identify Target Populations and Public Participation Needs

- Performed demographic analysis of the population within the study area.
- Identified significant populations for targeted outreach; low income, minority (Asian, Hispanic) and LEP (Tagalog) outreach to a large Pilipino population and smaller Spanish speaking population.

Coordinate Internally

- GCR, OCR and Planning determined the most appropriate form of outreach to be meetings.
- Determined the meeting locations would be central, accessible and walkable to the study area.

Coordinate with CBO Partners

- GCR researched and identified specific, local organizations through which to conduct targeted outreach low income, Asian, Hispanic and Tagalog and Spanish language speakers in the study area: North Peninsula Neighborhood

Services Center; El Concilio of San Mateo (Spanish speakers, low income); Pilipino Bayanihan Resource Center (Asian, Tagalog and Spanish speakers); North Peninsula Food Pantry & Dining Center of Daly City; Liwanag Kultural Center (Asian); Daly City Community Service Center (multi-cultural); Filipino Community Center (Asian, Tagalog speakers); Pacifica Resource Center (Asian, Hispanic, low income, Spanish and Tagalog speakers); St. Bruno's Catholic Church (multi-cultural, low income); Legal Aid Society of San Mateo; Samaritan House (low income); Merced Extension Triangle Neighborhood Association; Doelger Senior Center; City of Daly City Planning Department; City of San Francisco Office of Supervisor Sean Elsbernd; War Memorial Community Center; Westlake Community Center; Colma Community Center; Lincoln Community Center; Parkmerced; San Francisco State University (multi-cultural, low income); Alma Via of San Francisco (senior housing).

- Partnered with local community-based organization (Pilipino Bayanihan Resource Center to conduct extensive outreach and host community meeting).

Conduct Outreach

- Created and hand-distributed first meeting notice to BART passengers who use the Daly City BART Station during morning and evening peak commute periods, as well as conventional mail distribution, and circulation by hand to local organizations, community leaders, businesses and community-based organizations
- Created multi-lingual meeting notice for BART passengers who use the Daly City BART Station during morning and evening peak commute periods, as well as conventional mail distribution, and circulation by hand to local organizations, community leaders, businesses and community-based organizations.

Identify Language Service Needs

- Translation services were offered but no requests were submitted.

Implement Public Participation Strategy

- Implementing public participation strategy, which includes three community meetings.

Compile, Review and Report Results

- Will compile and review results.
- Will report results.

Specific Project Example 3

The purpose of this project is to implement BART's Strategic Maintenance Plan and to accommodate an expanded fleet. Project construction will take place in two Phases, with Phase 1 construction potentially beginning in 2012.

In October 2010, BART hosted a public meeting to discuss and solicit input from community members regarding the proposed project.

Identify Target Populations and Public Participation Needs

- Performed demographic analysis of the population surrounding the project area (Hayward and Union City).
- Identified significant populations for targeted outreach: low income and LEP persons (Spanish, Chinese and Tagalog language speakers).

Coordinate Internally

- GCR, OCR and project staff determined the most appropriate form of outreach to be a meeting and determined the goals and objectives of the community meeting.
- Developed public participation strategy.

Coordinate with CBO Partners

- GCR researched and identified specific, local organizations through which to conduct targeted outreach to low income and Spanish- and Tagalog-speaking area residents.

Conduct Outreach

- Created a meeting notice in multiple languages (English, Spanish and Tagalog) for conventional mail distribution and circulation through community and civic organizations.
- Mailed a multi-lingual meeting notice to approximately 4,600 residents and 600 businesses within a one-mile radius of the project.
- Posted a multi-lingual meeting notice on BART website and distributed it to the following community and municipal organizations: Afghan & International Refugees Support Services, Alameda County One Stop Career Center, Centro de Servicios, Continental Mobile Home Park, Daison Japan (Asian and Pacific Islander Market), Eden Area YMCA, Hayward City Hall, Hayward Day Labor Center, Hayward Family Resource Center, Hillview Baptist Church, Hillview Crest Elementary School, Kennedy Community Center, La Familia Counseling Services, Lincoln Child Center, Marina Food (Asian and Pacific Islander Market), Masjid Abubaker Siddiq (Islamic Mosque), New Haven Adult School, Nichiren Buddhist Center International Center, Our Lady of the Rosary Parish, Rental Housing Owners Association of Hayward, South Hayward Parish, Spanish Ranch Mobile Home Park No. 2, Tiburcio Vasquez Health Center, Union City Library, and the City Hall of Union City.
- Advertised meetings in local and ethnic newspapers including: Tri-City Voice, Sing Tao (Chinese), Philippine News (Tagalog), and Philippines Today (Tagalog).

Identify Language Service Needs

- Chinese language interpretation was requested for one meeting and translation services were provided.

Implement Public Participation Strategy

- Implemented public participation strategy, which included one public meeting.

Compile, Review and Report Results

- Compiled and reviewed results.
- Reported results. Project information on the comment period and meeting was made available on the BART website in English, Spanish, Chinese, Korean, Vietnamese and Tagalog.

Specific Project Example 4

This project is a 5.4 mile extension of the end of the line in Fremont to a new station. Construction is underway and anticipated to be complete in late 2014.

In April 2011, BART hosted two public meetings to solicit input from southern Alameda County and northern Santa Clara County residents on key station elements including access, parking, fares and amenities. Express bus riders along the corridor were also surveyed.

Identify Target Populations and Public Participation Needs

- Performed demographic analysis of the population within the corridor.
- Identified significant populations for targeted outreach: Hispanic, Asian and Pacific Islander and LEP persons (Spanish, Chinese, Vietnamese and Korean language speakers).

Coordinate Internally

- GCR, OCR and project staff determined the most appropriate form of outreach to be two meetings and a field survey.
- Determined the locations for two meetings within the corridor based on the demographic analysis and recommendations from community leaders. Meetings were scheduled in Fremont and Milpitas.
- Developed public participation strategy.

Coordinate with CBO Partners

- GCR researched and identified the following specific local organizations through which to conduct targeted outreach to Spanish-, Chinese-, Vietnamese- and Korean-speaking corridor residents: Fremont Family Resource Center; Bay Area Immigration and Refugee Services (BAIRS); South Bay Chinese Club; India Community Center; Milpitas Food Pantry; The Family Giving Tree; Jain Center of Northern California; LIFE Eldercare.

Conduct Outreach

- Performed field surveys in Downtown San Jose and at Fremont BART Station of express bus riders along the corridor.
- Contacted and worked with Santa Clara Valley Transit Authority (VTA) staff to inform them of the outreach process and determine what outreach they have done for the VTA BART extension project.
- Created a meeting notice in multiple languages (Spanish, Chinese, Vietnamese and Korean). Also, included a tag line in Persian and Hindi informing the speakers of those two languages that translation services and child care can be made available if requested 72 hours in advance of meeting time.
- Mailed multi-lingual meeting notice to a half-mile radius around each meeting location, as follows: Fremont, Warm Springs Community Center, 1,752 notices mailed; Milpitas, Milpitas Community Center, 893 notices mailed.
- GCR, OCR and project staff drafted a meeting survey instrument and field survey instrument which was produced in Spanish, Chinese, Vietnamese and Korean.
- Informed City staff and County elected officials of upcoming meetings and asked them to share the information with their constituents, including: City Councils and Mayors of Fremont and Milpitas, Local Chambers of Commerce, and Alameda County Board of Supervisors.
- Contacted local City Managers and Planning Commissioners to inform them of meetings.
- Electronically posted meeting notice including: BART website, project page, Facebook and Twitter.
- Advertised meetings in the following newspapers: Milpitas Post, Fremont Bulletin, Tri City Voice, India West, Vision Hispaña (Spanish), Kyocharo News (Korean), World Journal (Chinese) and Vietnam Daily News (Vietnamese).
- Contacted local neighborhood and business groups to request the distribution of the multi-lingual meeting notice, including: Irvington Business Association, Warm Springs Business, Community Association, Niles Main Street and Avalon HOA.
- Called and visited local community-based and faith based organizations including: South Bay Community Church, Fremont; First Baptist Church, Fremont; Church of Jesus Christ of Latter Day Saints, Fremont; Warm Springs Church, Fremont; Cross Point Church of Silicon Valley, Milpitas; Saint John the Baptist, Milpitas; Milpitas Community Church, Milpitas; India Community Center, Milpitas; Barbara Lee Senior Center, Milpitas; League of Women Voters; National Federation for the Blind; Fremont/Newark YMCA, California School for the Deaf, Fremont; Irvington Community Center, Fremont; Bay Area Community Services Center, Fremont; Warm Springs Community Center, Fremont; and Northwest Polytechnic University, Fremont.
- Contacted and informed other transit agencies in the corridor (AC Transit, VTA).

Identify Language Service Needs

- Korean language interpretation was requested for one meeting and translation services were provided.

Implement Public Participation Strategy

- Implemented public participation strategy, which included two public meetings.

Compile, Review and Report Results

- Currently compiling and reviewing results.
- Will report results.

VI. PERFORMANCE MEASURES AND OBJECTIVES

A. Monitoring and Tracking

Public Participation Plan

Community members emphasized accountability during the process of developing the PPP. BART's Office of Government and Community Relations will monitor and track its public participation methods and share results in a transparent way. This includes being clear about process timelines and changes at BART that affect public participation methods.

BART already has some information about the reach of its ongoing methods. For example, BART currently tracks how many people receive notifications by email or text and through its Facebook page. BART also tracks website hits, telephone inquiries, the number of newsletters distributed through its stations and other measures of community contacts. BART staff track the number of inquiries and comments they receive by phone, email and in-person.

These numbers can help track communication methods, but additional measurements will be needed to determine if public participation goals are being met. Depending on the nature and scale of the topic or decision at hand, BART will identify specific measurable objectives for public participation methods.

Some measurable performance objectives BART will consider include:

- Number of participants attending a participation activity.
- Percent of the participants from a specific geographic area.
- Number and percent of participants providing feedback in languages other than English (identify number of respondents by language).
- Number and percent of responses received to a survey or questionnaire.
- Number of webpage downloads occurring during a specific time period.
- Number and percent of participants signed up to receive web, phone, or mail-based communications as a result of a participation activity.
- Number and percent of contacts updated (on a monthly or quarterly basis) to ensure participants continue receiving notices and announcements.
- Number and percent of participants expressing satisfaction regarding the process or results of a participation activity.

Other Methods

Community partners may be able to help BART identify baseline information and other data to help determine additional performance measurement methods. It is also

important to ask community meeting participants how they heard about the meeting so as to determine how best to target outreach efforts.

B. Public Participation Outcomes

After each public participation strategy implementation, community members have expressed an expectation and preference that BART share what it has learned from the community, and how it took that information into account. BART should be able to demonstrate to the community that it has considered and explored the direction recommended by the public and taken that into account as part of its overall analysis. BART should explain its rationale when, for example, a highly popular suggestion was not implemented because it was found to be technically unfeasible or cost-prohibitive. BART staff and Directors need to report back on the results of the analysis for methods for which public input was sought.

C. Conclusion

The BART Public Participation Plan is intended to be a living document that will be informed by current and future practices, successes and lessons learned. BART could continue to adapt and modify its public participation practices and language assistance services over time.

The more than 1,000 community members who gave so graciously of their time during the last few months told us that not only must BART do a better job of reaching out, but we must also better define the services that we already have.

Through this process of asking the community to help us to create the most effective Public Participation Plan possible, we have learned that building bridges and trust among people who have historically felt excluded from real institutional decision-making is a journey that will take time and a redoubled commitment from all of the staff at BART.

INFORMATION REQUIRED FOR PROBABLE CATEGORICAL EXCLUSION
(Per 23 C.F.R. Part 771.118)

For the
Transbay Corridor Core Capacity Program
BAY AREA RAPID TRANSIT (BART)

Revision Record	
Issue No.	**Date**
Draft 1	January 2017
Draft 2	May 2017
Draft 3	June 2017
Draft 4	August 2017
Final	October 2017

U.S. Department
of Transportation

**Federal Transit
Administration**

REGION IX
Arizona, California,
Hawaii, Nevada, Guam,
American Samoa,
Northern Mariana Islands

90 7th Street
Suite 15-300
San Francisco, CA 94103-6701
(415) 734-9490
(415) 734-9489 (fax)

SEP 14 2017

Ms. Grace Crunican, General Manager
San Francisco Bay Area Rapid Transit District
300 Lakeside Drive, P.O. Box 12688
Oakland, CA 94604-2688

Re: Categorical Exclusion Request for BART
Transbay Core Capacity Project

Dear Ms. Crunican, GRACE

The Federal Transit Administration (FTA) has completed its review of your letter received on September 5, 2017 for an environmental determination for the proposed San Francisco Bay Area Rapid Transit District (BART) Transbay Core Capacity project (Project). The project proposes a package of strategic investments that will increase BART capacity between San Francisco and Oakland. The project consists of four elements including the expansion of the rail car fleet by 306 cars, the expansion of the existing Hayward Maintenance Complex (HMC), the implementation of a communications-based train control system (CBTC), and the addition of five new traction power substations (TPSS).

Based on the information presented in your request letter and the supporting documentation you submitted, we concur in your determination that the Project described above meets the criteria for a NEPA categorical exclusion (CE) in accordance with 23 CFR Part 771.118 (subsections (c)(1) (power substations and other discrete utilities within or adjacent to existing right of way), (c)(5) (installation and improvement of safety and communication equipment within or adjacent to existing right of way), (c)(7)(acquisition of rail cars that can be accommodated by existing facilities or by new facilities that qualify for categorical exclusion) and (c)(12) (projects within existing operational right of way including transit power substations and transit venting structures).

This review, which is based on past experience with similar projects, finds that the Project: does not induce significant environmental impacts to planned growth or land use for the area; does not require the relocation of significant numbers of people; does not have a significant impact on natural, cultural, recreational, historical or other resource; does not involve significant air, noise, or water quality impacts; does not have significant impacts on travel patterns; and does not otherwise, either individually or cumulatively, have any significant environmental impact.

If you have any questions about this review, please contact Dominique Paukowits, FTA Region IX Community Planner, at (415) 734-9469 or dominique.paukowits@dot.gov.

Sincerely,

Leslie T. Rogers
Regional Administrator

INFORMATION REQUIRED FOR PROBABLE CATEGORICAL EXCLUSION (Per 23 C.F.R. Part 771.118)

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Acronyms

AC	Alternating Current
BAAQMD	Bay Area Air Quality Management District
BART	Bay Area Rapid Transit
BMP	Best Management Practices
CBTC	Communication-based Train Control
CE	Categorical Exclusion
CEQA	California Environmental Quality Act
CNDDB	California Natural Diversity Database
DC	Direct Current
EJ	Environmental Justice
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
GHG	Greenhouse Gases
HHS	Department of Health and Human Services
HMC	Hayward Maintenance Complex
LEP	Limited English Proficiency
MPO	Metropolitan Planning Organization
MTC	Metropolitan Transportation Agency
NAHC	Native American Heritage Commission
NEPA	National Environmental Policy Act
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
ROQ	Right-of-way
RTP	Regional Transportation Plan
RWQCB	Regional Water Quality Control Boards
SFMTA	San Francisco Municipal Transportation Agency
SHPO	State Historic Preservation Officer
SWRCB	State Water Resources Control Board
TIP	Transportation Improvement Program
TPSS	Traction Power Substations

INTRODUCTION

This Documented Categorical Exclusion (DCE) is intended to satisfy NEPA requirements for the Transbay Corridor Core Capacity Program. The DCE is divided into 21 sections or "Topic Areas" designated A through U, as shown in the Table of Contents on **page 2**. Topic Area A describes the Transbay Corridor Core Capacity Program, Topic Area B describes the location of each program element, and Topic Areas C through U discuss the program's anticipated impacts on the physical and human environment.

A. DETAILED PROJECT DESCRIPTION

The Bay Area Rapid Transit (BART) system currently consists of 112 route miles of heavy rail transit serving 46 stations in San Francisco, in the East Bay, and on the Peninsula (see **Figure 1**). An additional 10 route miles and 2 stations are currently under construction south of Warm Springs, and an additional 10 miles and 2 stations are being built in eastern Contra Costa County. The system operates as five lines designated by different colors - Yellow, Green, Red, Orange and Blue. Four of these lines - all but the Orange Line - merge into a single double-track alignment connecting San Francisco and Oakland, which operates through the Transbay Tube[1].

Figure 1: Existing BART System plus Extensions under Construction

On the main trunk of the BART system, from the Oakland wye through the Transbay Tube to Daly City, BART currently operates a maximum of 23 trains per hour in the peak direction. Train lengths vary, but currently average 8.9 cars per train in the peak. Between Oakland and San Francisco, peak hour trains are crowded and ridership is continuing to grow. As the system expands and the core of the system continues to attract development, further increases in ridership are expected.

[1] Bay Area Rapid Transit (BART), Available online: *https://www.bart.gov*

BART is proposing a package of strategic investments that will increase capacity between San Francisco and Oakland by more than 30 percent. During peak hour (weekdays from 8 to 9 am and 5:30 to 6:30 pm), the number of trains operating through the tube will be increased from 23 per hour to 30 in each direction, and train lengths will be increased from an average of 8.9 to 10 cars per train. The Transbay Corridor Core Capacity Program will allow BART to operate up to 30 ten-car trains per hour through the Transbay Tube, maximizing passenger throughput in the most heavily used part of the system. The program includes four elements:

1. Expansion of the rail car fleet by 306 new cars;
2. Phase 2 of the Hayward Maintenance Complex (HMC) to add additional storage for the expanded rail car fleet;
3. Communication-based train control (CBTC) system;
4. Five additional traction power substations (TPSS).

Each of these elements is further described starting on **page 8**.

CEQA Process and Prior NEPA Documentation

The California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) processes for Phases 1 and 2 of the HMC were already well advanced when the CEQA and NEPA processes were undertaken for the rest of the Transbay Corridor Core Capacity Program:

- May 26, 2011: the BART Board adopted the Final Negative Declaration for HMC under CEQA.
- September 21, 2011: the Federal Transit Administration (FTA) approved a Categorical Exclusion (CE) for HMC under NEPA. The CE indicated no adverse impacts.
- May 9, 2013: the BART Board adopted an Addendum to the CEQA Negative Declaration to cover demolishing Building 3 and replacing it with a new building for the component repair shop. This change is in HMC Phase 1 and does not affect Phase 2.

The FTA's 2011 Categorical Exclusion for HMC covered both Phase I (maintenance facility) and Phase 2 (storage facility). At the time, BART was experiencing a short term need for added maintenance capacity but was unsure of the need for additional storage at HMC. The future need for additional storage capacity was viewed in the context of planning for other major expansion projects. BART elected to proceed with HMC Phase 1 as a separate project with independent utility from HMC Phase 2. Once planning for the Transbay Corridor Core Capacity Program was initiated, the need for additional cars and storage became more apparent, and prior work on HMC Phase 2 was revived.

The BART Board adopted a second addendum to the HMC Negative Declaration in August 2016. That addendum summarizes the changes made to the HMC project since 2011. Only one of the changes – a sound wall discussed in Section H *Noise* (**page 37**) – is within the footprint of HMC Phase 2. Otherwise, neither Phase 2 of HMC nor the environment affected by Phase 2 has changed since 2011, and no additional impacts are anticipated. The Negative Declaration and the CE for HMC plus the two addenda are incorporated into this document by reference and are provided as appendices.

On November 17, 2016, the BART Board adopted the Transbay Corridor Core Capacity Program with a finding that the 306 added vehicles, communications based train control, and five additional traction power substations are statutorily exempt from the CEQA in accordance with the Public Resources Code, Section 21080(b)(10). This BART Board action completes the CEQA process for these three elements. The CEQA process for HMC was completed by the Negative Declaration and the addenda to the Negative Declaration cited above.

Expansion of the rail car fleet by 306 new cars

BART's existing fleet of 669 rail cars is at the end of its useful life and is being replaced. BART is starting to receive deliveries on an order of 775 vehicles, including 669 replacement vehicles and 106 vehicles for extensions and capacity expansion[2].

In a second phase of vehicle procurement, the subject of this categorical exclusion, BART intends to acquire an additional 306 new rail cars, bringing the total fleet to 1,081 vehicles.

Of the 306 additional cars to be acquired in the second phase, 252 are needed for BART to expand capacity in the Transbay Corridor and to operate 30 ten-car trains per hour on the four lines that operate through the Transbay Tube (Red, Blue, Green and Yellow). The remaining 54 are to increase capacity on the Orange line (which does not operate through the Transbay tube) and to provide additional cars for the ready reserve fleet.

Phase 2 of the Hayward Maintenance Complex

The current storage capacity across all of BART's yards and tail tracks is 893 vehicles. BART currently has 669 cars in the fleet, and BART has 775 new cars on order to replace the existing fleet. Once the new fleet of 775 cars is delivered, BART will still have capacity for 893 cars, meaning that space for approximately 118 additional cars will exist on the system, though all unused spaces cannot always be used effectively, due to the need to have spare spaces to marshal trains in the yards. To accommodate the additional 306 new vehicles that BART will acquire as part of the Transbay Corridor Core Capacity Program, and to maintain functional yards with room to properly marshal trains, BART will construct HMC Phase 2 to provide storage for 25 ten-car trains, or 250 additional rail vehicles. This will give BART a future total fleet of 1081 cars and a system storage capacity of 1143 cars across all the yards. BART will have marshalling capacity of approximately 62 spaces, divided between 4 yards, or about 15 spaces per yard. This space is needed to keep the yards functional.

The yard will be constructed with access to the existing yard and electrified such that it may serve as a fully operational vehicle storage facility. The HMC offers the only practical site to expand storage on the BART system to accommodate the additional cars that are part of the Transbay Core Capacity Program. HMC Phase 2 provides for additional storage capacity only. Added maintenance capacity will be provided by the HMC Phase 1 project, which is separately funded and outside the scope of the Transbay Corridor Core Capacity Program.

Communication-based Train Control (CBTC) System

To achieve the shorter headways needed to operate 30 regularly scheduled trains per hour through the Transbay Tube, BART will replace its existing train control system with a new CBTC system.

The new CBTC system will be based on a moving-block signaling approach throughout the existing system plus the extension now under construction between Warm Springs and Berryessa. The new CBTC system will consist largely of lineside equipment installed within BART's existing right-of-way throughout the entire system. Existing signaling equipment will be overlaid with the most current electronics, software, computer systems, and cabling. New zone controllers, radio antennas, interlocking controllers and wayside radio transponder tags will be installed throughout the trackside alignment, train control rooms and central control facilities. Cars and maintenance vehicles will be outfitted with processor based controllers, transponders, communication equipment and location sensors.

[2] Bay Area Rapid Transit (BART) *New Train Car Project* http://www.bart.gov/about/projects/cars/why-new-cars [Accessed on August 17th 2016]

Installation activities will include trenching for new cabling, concrete pads for electronic equipment and radio antennas along the trackway as well as new racks, servers, computers, communication equipment and cable trays within the wayside train control rooms and central control facilities. These activities will take place within existing BART right-of-way.

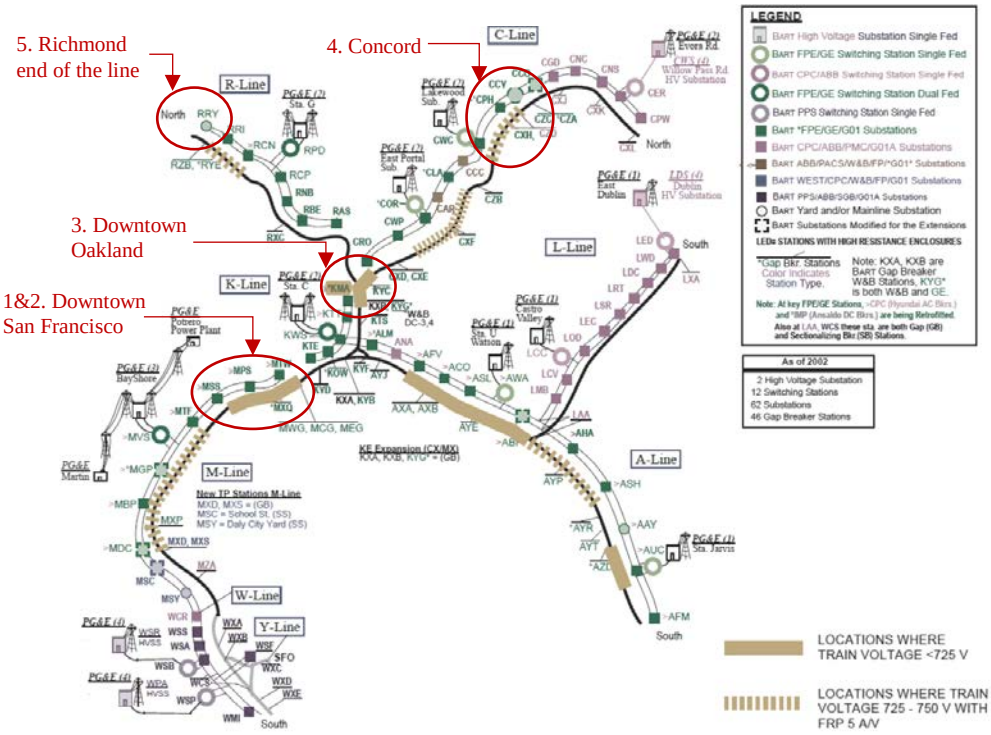
New Traction Power Substations (TPSS)

The increased train lengths and more frequent peak period trains will require additional traction power during operation. BART has conducted simulations to assess the power requirements associated with operating 30 regularly scheduled ten-car trains through the Transbay Tube per hour. The simulations assumed 30 trains per hour, and included various delay scenarios that would lead to bunched trains, providing a safety factor or contingency in the analysis. It also assumed the electrical profile of BART's new vehicles as well as the CBTC system necessary to operate trains this frequently. The simulations revealed specific areas along BART's mainline where the traction power requirements for the increased service exceed the capacity available from BART's existing traction power system[3].

Five sites have been identified for new substations and are shown in the **Figure 2**

1. Civic Center Station in San Francisco
2. Montgomery Station in San Francisco
3. Oakland near I-980 and 34th Street
4. Concord - David Avenue and Minert Road
5. Richmond - RYE Gap Breaker Conversion (Richmond Yard)

Figure 2: The BART Traction Power Subtransmission Network and Low Voltage Areas



[3] PGH Wong Engineering Inc., *BART Transbay Corridor Core Capacity Traction Power Simulation*, October 2016 **[Appendix E]**

Placement of a new TPSS in proximity to each area of low voltage will allow BART to operate the 30 train per hour service optimally. Locating a new TPSS close to an existing TPSS site would only introduce redundant traction power capacity in that area and not enhance the existing system overall. Accessibility for operations and maintenance is another consideration when siting a new TPSS.

Further details on the siting of the five new TPSS are provided in Topic B, *Location*, starting on **page 11**.

Description of a TPSS

The typical TPSS site must accommodate several equipment areas, each one with certain required spatial clearances. Spacing considerations must include an Alternating Current (AC) house, Direct Current (DC) house, and space for two rectifier-transformers. These items of equipment can be configured in different ways so that the TPSS footprint can be accommodated within each site.

Figure 3: Typical TPSS Layout 1

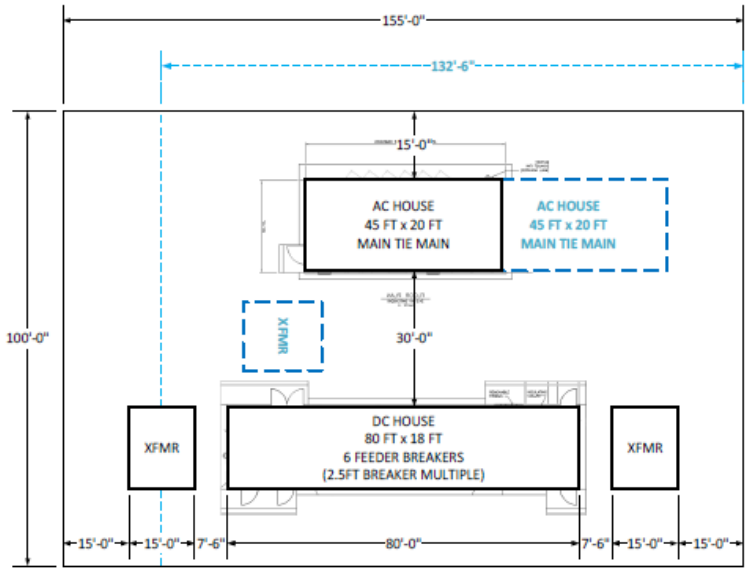
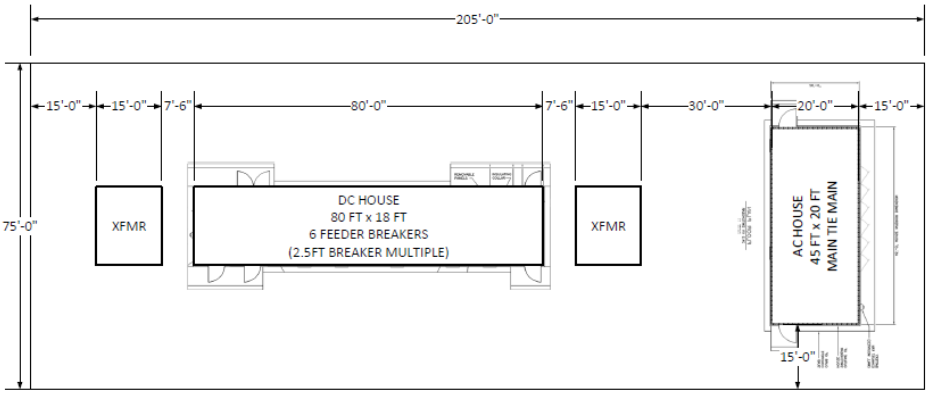


Figure 4: Typical TPSS Layout 2



Ventilation

The TPSS sites in San Francisco will be located under Market Street, within the existing BART stations at Montgomery and Civic Center. Underground TPSS facilities require a ventilation system. This system will be vented to the street level through a ventilation plenum, which can terminate at an at-grade vent grate in the sidewalk right-of-way. BART has identified several options for ventilating the two new TPSS under Market Street, and is coordinating with the City of San Francisco on the locations and design of these vents, which will be finalized during the design phase. The vents will be constructed pursuant to the California Building Code Chapter 4, Section 433, *Fixed Guideway Transit System* requirements and the National Fire Protection Association (NFPA) 130 Standard for Fixed Guideway Transit and Passenger Rail Systems, Edition 2014 requirements.

Constructability

BART has performed a constructability analysis[4] for the new TPSS to be located in downtown San Francisco. Consideration was given to spatial constraints and weight of the equipment as well as the impact on stakeholders during construction and installation. Installation activities for each new substation site in Downtown San Francisco will include:

- Providing temporary barrier
- Providing protection for other equipment.
- Providing civil and structural improvements.
- Installation of raceways and conduits through SFMTA and BART levels of the stations.
- Modification of entry points (passenger or skylight) for TPSS equipment delivery.
- Delivery and installation of TPSS equipment.
- Building permanent fire rated barrier.
- Restoration of facilities to their former state.

The constructability analysis confirmed that the TPSS could be installed within the Montgomery and Civic Center stations. At Montgomery, one station entrance would be temporarily closed, an escalator and stairway would be removed to provide a space for dropping the equipment down to the concourse level, and then the escalator and stairway would be replaced. At Civic Center, the current western access points located in front of Burger King (north-west corner of the intersection of Market and 8th Street) and in front of Chase Bank (south-west corner of the same intersection) would be permanently closed, to enable construction activities; and also to serve as the locations for placement of the emergency ventilation system and ventilation grates. Stairs and escalators at these two entrances will be removed, the TPSS equipment would be dropped to the concourse level through the opening, and then the opening would be decked over to create additional sidewalk space for pedestrians. Street lane closures may be required at both locations as the equipment is delivered to the site by truck, but will be limited in duration and occur during night time hours to minimize traffic impacts. The eastern entrances at the intersection of Market and 8th Street, the entrance at United Nation Plaza and the entrances at the intersection of Market and 7th Street would remain available for passenger use.

B. LOCATION

The new fleet will operate and the CBTC system will be installed within existing BART-owned right-of-way throughout BART's 112-mile system in five counties: San Francisco, Alameda, Contra Costa, San Mateo and Santa Clara. The physical features to be constructed as part of the Transbay Corridor Core Capacity Program – the features with a potential for environmental impacts – are HMC Phase 2 and the five traction power substations. The location of these features is further described below.

[4] PGH Wong, *Core Capacity Traction Power Equipment Constructability Review Downtown San Francisco, Revision B, November 7th, 2016* **[Appendix F]**

HMC Phase 2 Location Description

The Hayward Maintenance Complex (HMC) is located in the City of Hayward in Alameda County, California. It is being constructed within an industrial area on BART-owned property adjacent to the existing Hayward Yard, BART's existing operating tracks, and existing railroad tracks owned by the Union Pacific Railroad (UPRR). HMC Phase 2, the portion of HMC covered by this Categorical Exclusion, is bounded by Parkway West to the north, Whipple Road to the south, BART's existing operating tracks to the west, and the UPRR tracks and Carroll Avenue to the east. Residential development exists on the opposite side of the UPRR tracks and Carroll Road. Figure 1 in the Second Addendum to the Final Initial Study/Mitigated Negative Declaration [**Appendix C]** illustrates the location.

TPSS Location Description

The five new TPSS to be installed as part of the program would be in three counties – San Francisco, Alameda and Contra Costa. They are identified in **Table 1** and further described below.

Figure 5**, p.13,** shows the general location of the substations throughout the BART network. Site maps are provided in **Figures 6 to 15, pages 14 to 22**.

Table 1: Location of the Five New TPSS

Substation	City	Address	Description
Downtown San Francisco - Civic Center Station	San Francisco	1231 Market Street, San Francisco, CA 94103	The site is located underground on the concourse level at the western end of the station. It would involve closing the two western entrances permanently to Civic Center Station.
Downtown San Francisco- Montgomery Station	San Francisco	544 Market Street, San Francisco, CA, 94104	The location of the substation is planned to be in BART's paid area on the concourse level.
Oakland – south of 34th Street in I-980 right-of-way	Oakland	Next to 626, 33rd Street, Oakland, CA, 94609	Under highway ramp from EB I-580 to SB I-980 on Caltrans freeway right-of-way.
Concord - David Avenue and Minert Road	Concord	In front of 2050 Minert Road, Concord, CA, 94518	The site is on BART right-of-way next to the BART track, across Minert Road from a school and near a residential area.
Richmond - RYE Gap Breaker Conversion	Richmond	646 Portola Avenue, Richmond, CA, 94801	The site is on BART right-of-way next to a BART railyard, adjacent to an active UPRR and Amtrak right-of-way, and across Portola Avenue from a residential area. The TPSS would replace an existing gap breaker station.

Figure 5: General Location of the Five New TPSS

Downtown San Francisco - Civic Center Station

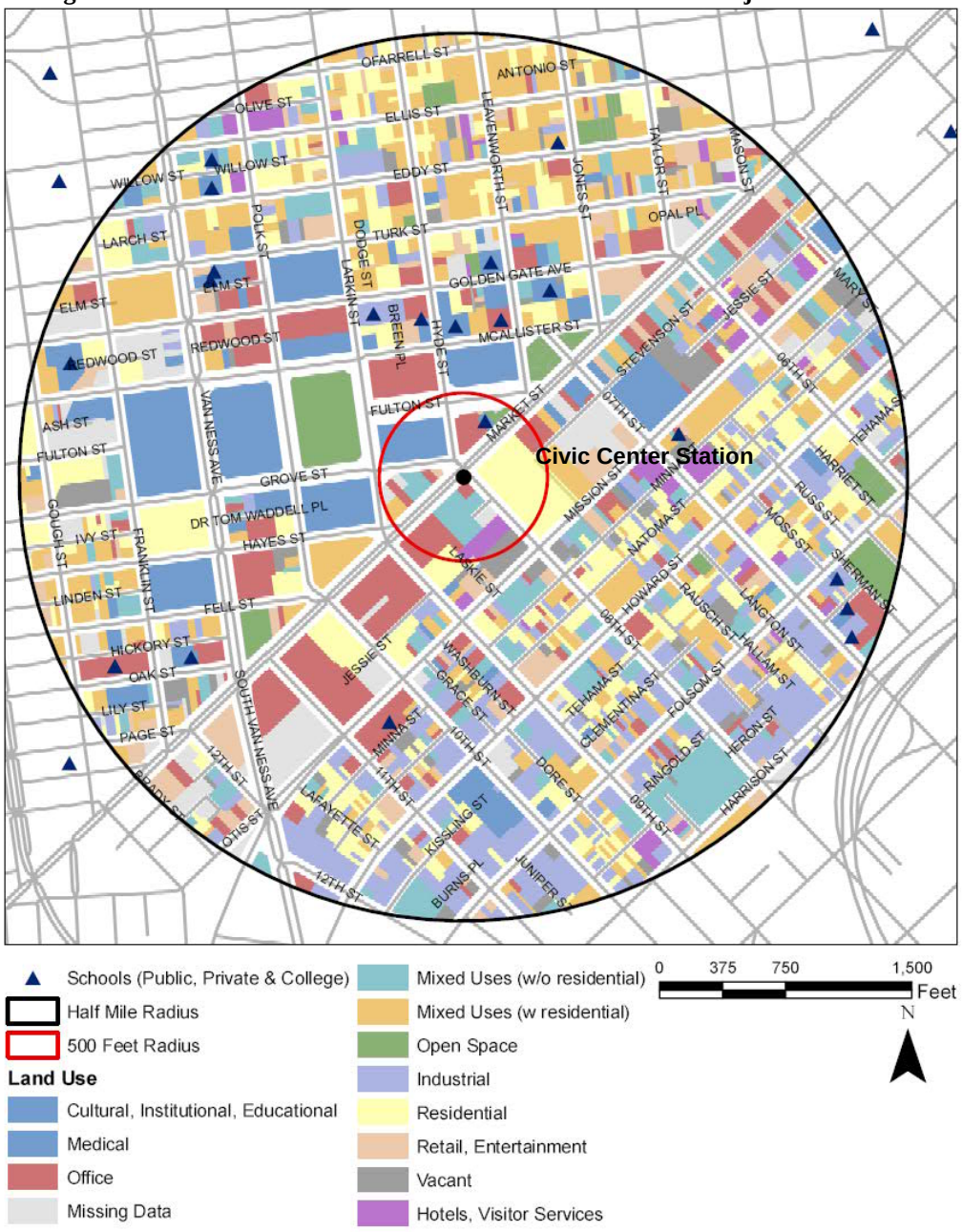
The proposed site for the *Civic Center* Station TPSS is underground on the concourse level of the station under Market Street, located near the intersection of Grove Street, Hyde Street and 8th Street. The proposed site would occupy the south-western end of the existing Civic Center Station.

The TPSS at Civic Center Station will be placed in the passageway connecting the concourse to the two station entrances located south and west of the station along Market Street as shown in **Figure 6, p.14.** This will necessitate the permanent closure of these entrances. John Rahaim, City and County of San Francisco Planning Department, sent BART a March 20, 2017, letter expressing support for BART's Core Capacity Program and acknowledging BART's intent to close the two westernmost entrances to the Civic Center Station and install a new TPSS in the corridor connecting the main part of the station to these entrances [**Appendix G**]. Six access portals would still be available for the riders at the eastern corner of the intersection of Market and 8th Street (2 access portals), the entrance at United Nation Plaza (2 access portals) and the entrances at the intersection of Market and 7th Street (2 access portals). The closure of these two portals has been analyzed for impact on emergency evacuation times and was found to have no impact [**Appendix H**].

Figure 6: Location of TPSS in Civic Center Station and Entrances to be Closed

The *Civic Center Station* site is located underground within the existing Civic Center Station near several public buildings including the San Francisco Public Library, the San Francisco City Hall and the Asian Art Museum. Parks in the vicinity of the proposed TPSS are the Civic Center Plaza and the United Nation Plaza. These elements are located north of Market Street. New residential buildings are under construction at the corner of 8th Street and Market Street. The TPSS will be located completely within existing transportation right-of-way underground within the Civic Center Station and will be consistent with the existing transportation land use. Consistency with land use and zoning is discussed in Topic D, *Land Use and Zoning*, starting on **page 24.**

Figure 7: Downtown San Francisco - Civic Center Substation Adjacent Land Use



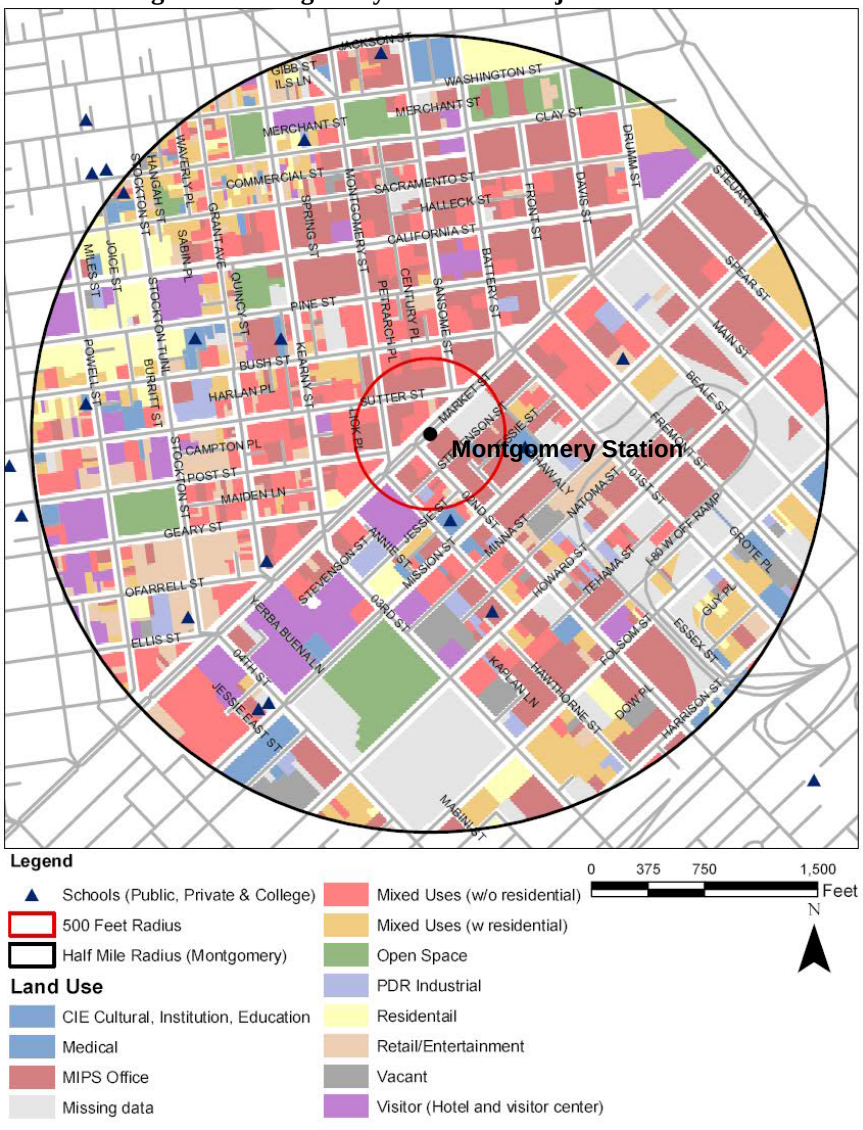
Downtown San Francisco - Montgomery Station

The location of the substation is planned to be underground on the concourse level in BART's paid area in Montgomery BART station in Downtown San Francisco. An alternative site is in the free area next to a MUNI stairway. Neither the underground concourse nor the area next to Muni stairway will involve permanent closure of any entrances to the Montgomery station.

The proposed site is located in the Financial District and the adjacent land uses are mainly offices. The TPSS will be located entirely underground, within existing transportation right-of-way within the Montgomery Station and will be consistent with the existing transportation land use. Consistency with land use and zoning is discussed in Topic D, *Land Use and Zoning*, starting on **page 24**.

Figure 8: Location of TPSS in Montgomery Station

Figure 9: Montgomery Substation Adjacent Land Use



Oakland –34th Street and I-980

The proposed substation would be located south of 34th Street in Caltrans-owned I-980 right-of-way, under the freeway off-ramp from eastbound I-580 to southbound I-980, as shown in Figure 10. The southbound I-980 lanes are immediately east of the site, and the BART trackway is in the center of the I-980 right-of-way. The proposed TPSS site is currently fenced in and accessible only by Caltrans maintenance crews, with no public access. The surrounding area is dominated by the freeway and ramp structures. The TPSS site is set among numerous large concrete freeway support columns for the freeway ramp structure overhead. Access to the TPSS site would be provided by the existing access road on the Caltrans right-of-way. Caltrans is supportive of this action based on initial conversations between BART and Caltrans, and a review of the proposal at a site meeting with Caltrans on August 15, 2016.

Several residential properties are located to the west of the proposed TPSS site. The residential properties are separated from the site by fences, trees, and the freeway support columns, which create an existing buffer between the TPSS site and the residential uses. A park is located on Caltrans property on the north side of 34th Street underneath the overhead freeway ramp structure north of 34th Street. The TPSS will be located completely within existing transportation right-of-way and will be consistent with the existing transportation land use for the parcel. Consistency with land use and zoning is further discussed in Topic D, *Land Use and Zoning*, starting **on page 24**.

Figure 10: Footprint of the Oakland TPSS

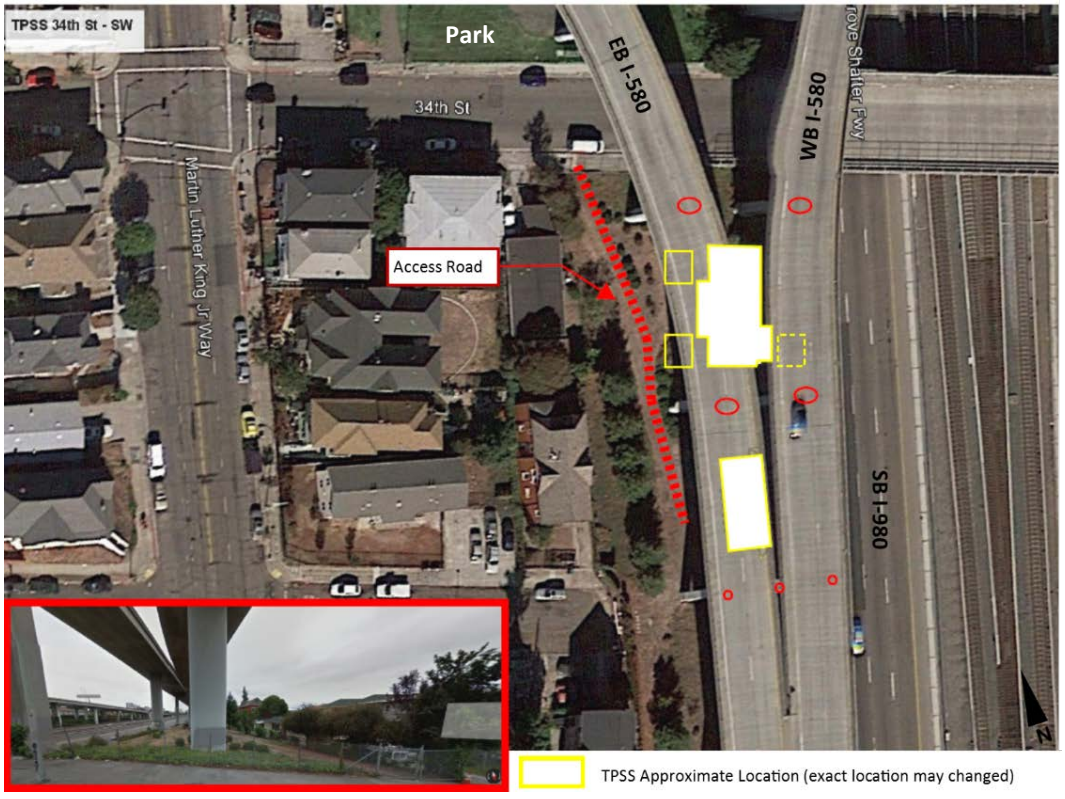
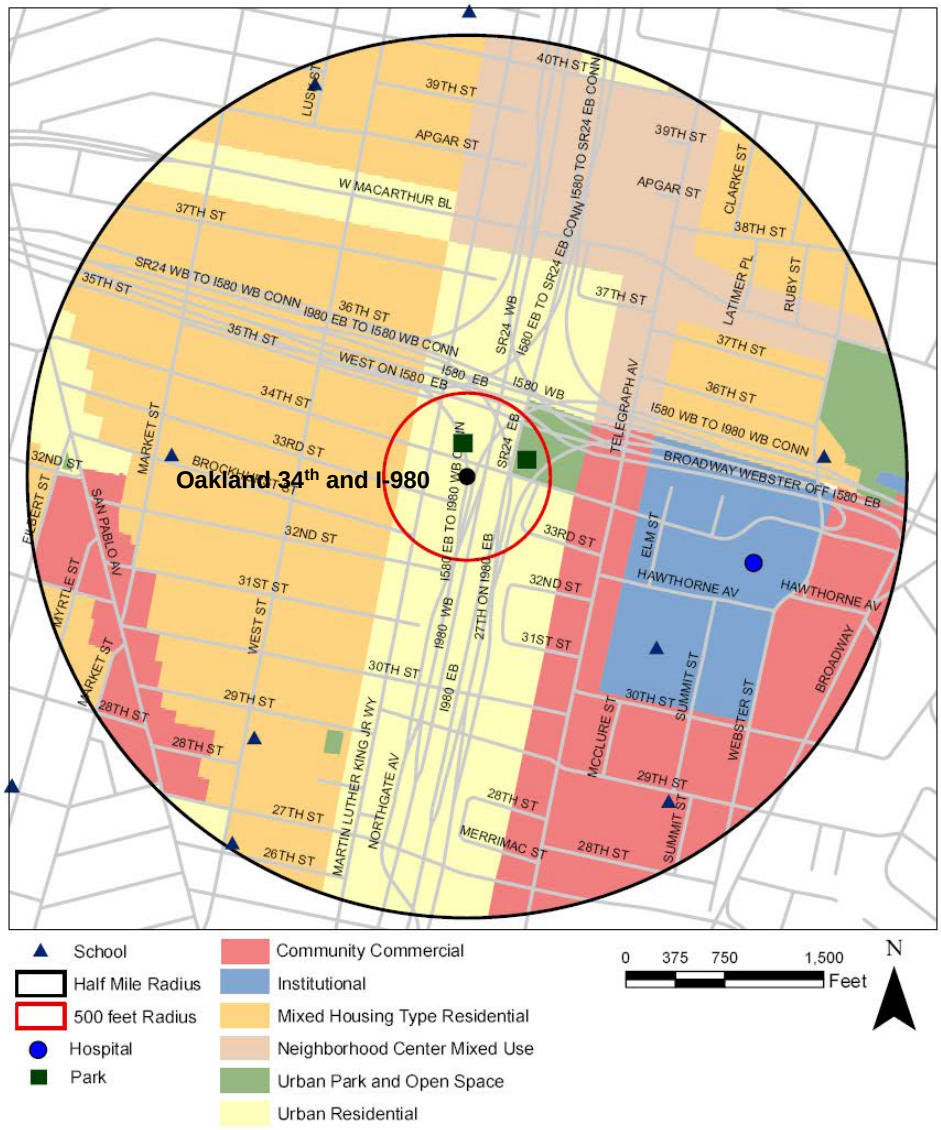


Figure 11: Oakland 34th Street and I-980 Substation Adjacent Land Use

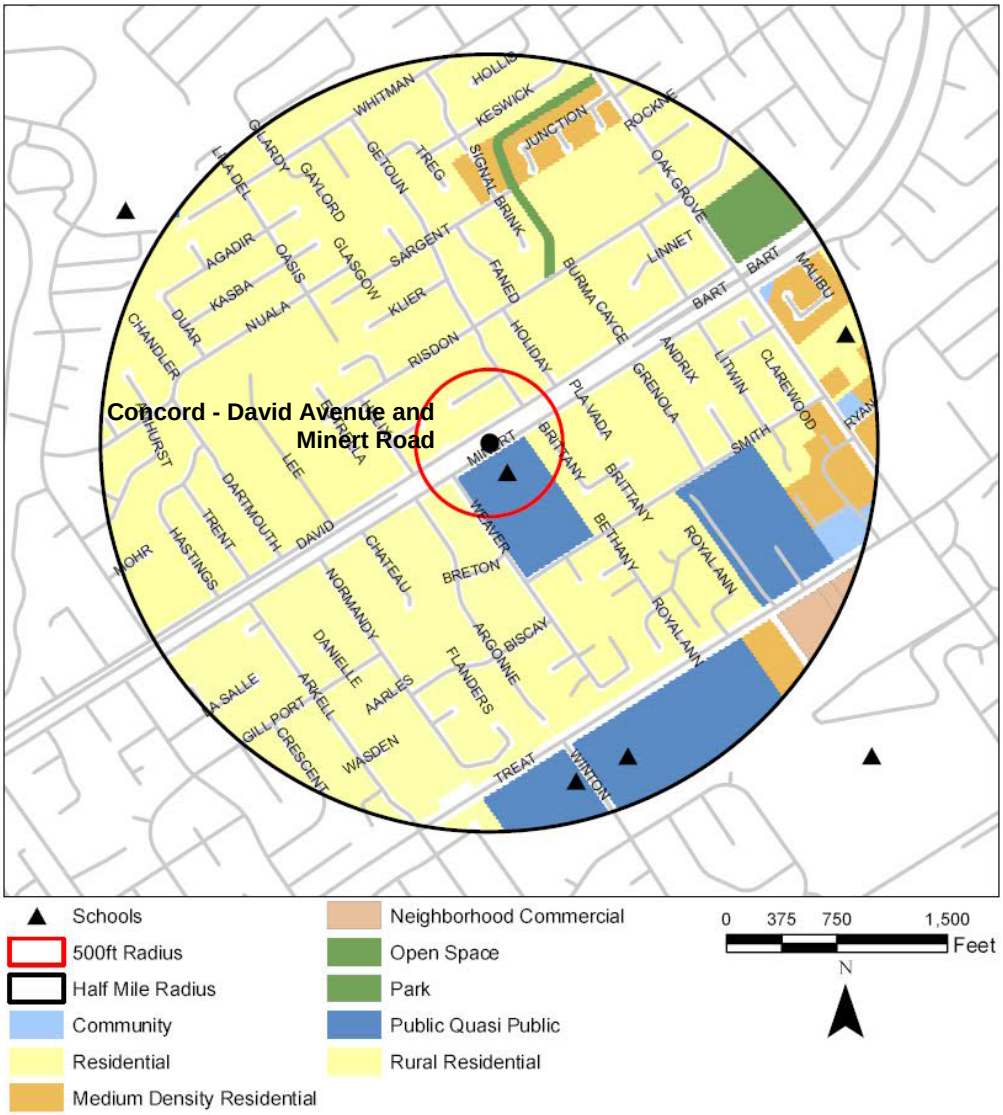


Concord - David Avenue and Minert Road

The site is located on BART's right-of-way south of BART's existing tracks and adjacent to Minert Road. The BART tracks are separated from all adjacent land uses by the two parallel arterial roadways on either side of the trackway, fencing, and vegetation. Minert Road is adjacent and parallel to the tracks on the south side, and David Avenue is adjacent and parallel to the trackway on the north side. The BART right-of-way is lined with vegetation at this point. Along the Minert Road side of the alignment, trees and other vegetation screen the right-of-way, and on the David Road side of the alignment, a hedge of oleander bushes screens the alignment. A middle school is located across Minert Road from the TPSS site. There are residential land uses adjacent to the school and on the north side of the BART tracks and across David Avenue. The closest residential use is north of the BART tracks and across David Avenue approximately 130 feet from the TPSS. The TPSS would be across Minert Road and approximately 150 feet from the closest building of the middle school. **Figure 12**, **p.19**, shows the orientation and location of the TPSS facility relative to the middle school. In general, the TPSS is parallel to the BART trackway and to the roadways on either side of the trackway. The TPSS will be located completely within existing transportation right-of-way and will be consistent with the existing transportation land use. Consistency with land use and zoning is further discussed in in Topic D, *Land Use and Zoning*, starting on **page 24.**

Figure 12: Location of Concord David Avenue and Minert Street TPSS

Figure 13: Concord - David Avenue and Minert Street Substation Adjacent Land Use



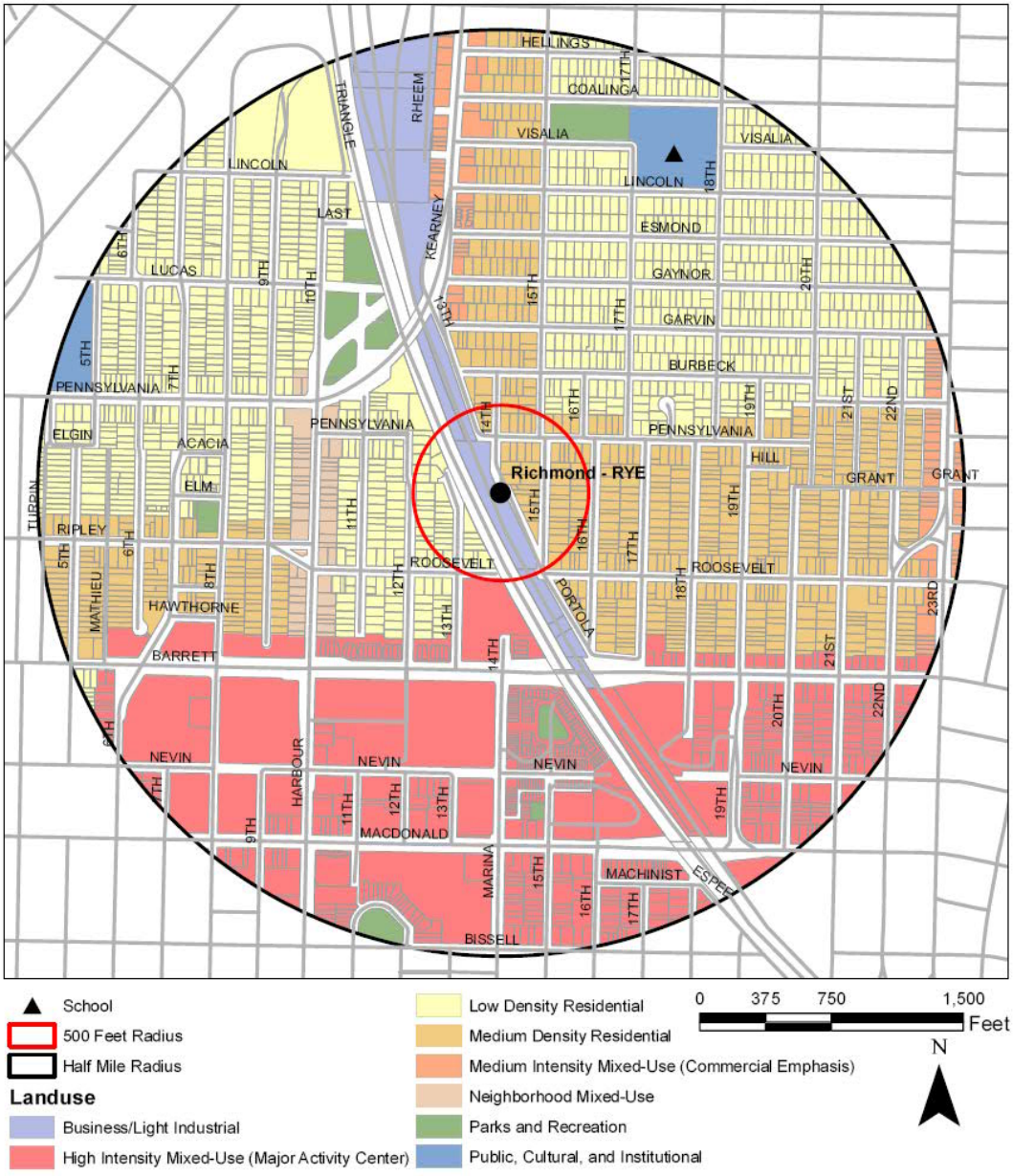
Note: According to the City of Concord general plan. The Public Quasi Public designation is applied to property owned by governmental entities and to semi-public facilities and it includes: Airport, hospitals, schools, government offices, corporation yards, and public facilities such as recycling centers, sewage treatment facilities and fire stations.

Richmond - RYE Gap Breaker Conversion

The TPSS site is on BART right-of-way between BART's existing railyard and Portola Avenue, and adjacent to an active Union Pacific and Amtrak railroad right-of-way. This site involves converting an existing gap breaker station to a TPSS. The TPSS would be consistent with the existing land use that currently includes the BART railyard and the UPRR/Amtrak railway tracks as illustrated in **Figure 14**, **p.21.** Several residential units are located on the opposite side of Portola Avenue from the site. The TPSS will be located completely within existing transportation right-of-way and will be consistent with the existing transportation land use. Consistency with land use and zoning is further discussed in Topic D, *Land Use and Zoning*, starting on **page 24**.

Figure 14: Richmond RYE Gap Breaker Conversion Location

Figure 15: Richmond Substation Adjacent Land Use



C. METROPOLITAN PLANNING AND AIR QUALITY CONFORMITY

The MPO for the San Francisco Bay Area is the Metropolitan Transportation Commission (MTC). The Regional Transportation Plan (RTP), called Plan Bay Area, was adopted in 2013 and amended in 2015. FTA and FHWA determined that the amended plan conforms to the State Implementation Plan for air quality on October 29, 2015.

On July 26, 2017, MTC adopted Plan Bay Area 2040. The Plan Bay Area 2040 Transit Project List (Appendix A to the Transportation-Air Quality Conformity Analysis for Plan Bay Area 2040 and Amended 2017 Transportation Improvement Program) includes BART's Transbay Corridor Core Capacity Project (all four major scope elements) as a fully-funded capital project. The RTP ID Number for the capital elements is 17-10-0006. The Transit Project List also states that the Core Capacity Project will be implemented in coordination with the BART Metro Program + Bay Fair

Connector, which includes the future service plan for 12-minute headways on all BART lines in the peak period (instead of current 15-minute headway) following implementation of the capital projects in the Transbay Corridor Core Capacity Project. The RTP ID Number for the BART Metro Program is 17-10-0005.

MTC performed the necessary studies to demonstrate air quality transportation conformity prior to adoption of Plan Bay Area 2040. MTC's plan-level conformity analysis included the fleet expansion element of the Transbay Corridor Core Capacity Project and the resulting BART Metro Program service plan with the more frequent 12 minute headways for the BART system. The remaining components of the Core Capacity Program – HMC Phase 2, CBTC and Traction Power Substations – are exempt from conformity analysis under 40 CFR 93.126 (As a fleet expansion, the acquisition of 306 vehicles is not exempt from conformity analysis.). Thus, BART's complete Transbay Corridor Core Capacity Program is included in an adopted, fiscally constrained regional transportation plan that is in conformance with the State Implementation Plan.

Non-exempt projects also require project-level air quality conformity, once they are included in a conforming regional plan with plan-level conformity. The railcar element of the Transbay Corridor Core Capacity Project is the one non-exempt element requiring project-level conformity. The vehicles are electrically powered, and more frequent service and increased capacity would tend to reduce VMT. On June 23, 2016, BART presented the Transbay Corridor Core Capacity Program to MTC's Air Quality Conformity Task Force (AQCTF) for information. Following adoption of Plan Bay Area 2040, which gives BART's Transbay Corridor Core Capacity Project BART plan-level conformity, BART returned to the AQCTF on August 24, 2017 and presented the project assessment finding that the Transbay Corridor Core Capacity Program is not a project of air quality concern under 40 CFR 93.123 (b)(1) for PM_{10} and/or $PM_{2.5}$, and a hotspot analysis is not required. The Task Force agreed and confirmed that the project is not a project of air quality concern.

The 2015 Transportation Implementation Plan (TIP) was adopted by the MTC on September 24, 2014 and was amended in 2015. FTA and FHWA last approved the conformity determination for the TIP on October 29, 2015. Appendix B to MTC's adopted Plan Bay Area 2040 includes an updated 2017 TIP with the elements of BART's Transbay Corridor Core Capacity Project as shown in **Table 2, page 23.**

Table 2: TIP ID in relation to the Core Capacity Project

Project Number	Name of the project	Air Quality Exempt Code	Explanation
TIP ID BRT030005	Traction Power System Renovation : *Replace obsolete elements and subsystems of the traction power system to maintain and improve reliability and safety*	2.08 - EXEMPT (40 CFR 93.126)	Reconstruction or renovation of transit buildings and structures (e.g., rail or bus buildings, storage and maintenance facilities, stations, terminals, and ancillary structures)
TIP ID BRT030004	Train Control Renovation: *Replace obsolete elements and subsystems of the train control system*	2.08 - EXEMPT (40 CFR 93.126)	Reconstruction or renovation of transit buildings and structures (e.g., rail or bus buildings, storage and maintenance facilities, stations, terminals, and ancillary structures)

D. LAND USE AND ZONING

The current zoning designation for HMC Phase 2 and surrounding areas is presented in the Final Negative Declaration [**Appendix A**]. HMC Phase 2 is consistent with the land use and zoning of the vicinity. No impacts are anticipated.

The current zoning designations around each of the five new TPSS are illustrated in **Figures 16** through **20, on pages 25 to 29**. Adjacent use maps are in Topic B, *Location*, starting on **page 11**. Each of the maps show a half mile radius and a 500 feet radius area. Schools within the vicinity of the proposed substation are identified on the land use map. Proposed TPSS sites are located in 4 different jurisdictions: San Francisco, Oakland, Richmond and Concord.

Zoning

Under state law (Cal. Gov. Code sections 53090 and 53091), local zoning and use permits under local zoning ordinances are not applicable to BART. Nevertheless, as shown below, the TPSS are compatible with existing zoning and land use. **Table 3**, on **pages 30** and **31**, shows the jurisdiction and existing zoning for the locations of each of the proposed TPSS. Four of the five proposed TPSS are located in existing BART right-of-way, and the fifth is within Caltrans right-of-way.

According to the San Francisco Municipal Code, zoning around Downtown San Francisco Civic Center substation is Downtown General (C3-G), and around Montgomery substation is Downtown Office (C3-O). Power substations are included in the use "Utility facility" of the Public Works Code.

Figure 16: Adjacent Zoning to Downtown San Francisco Civic Center Substation

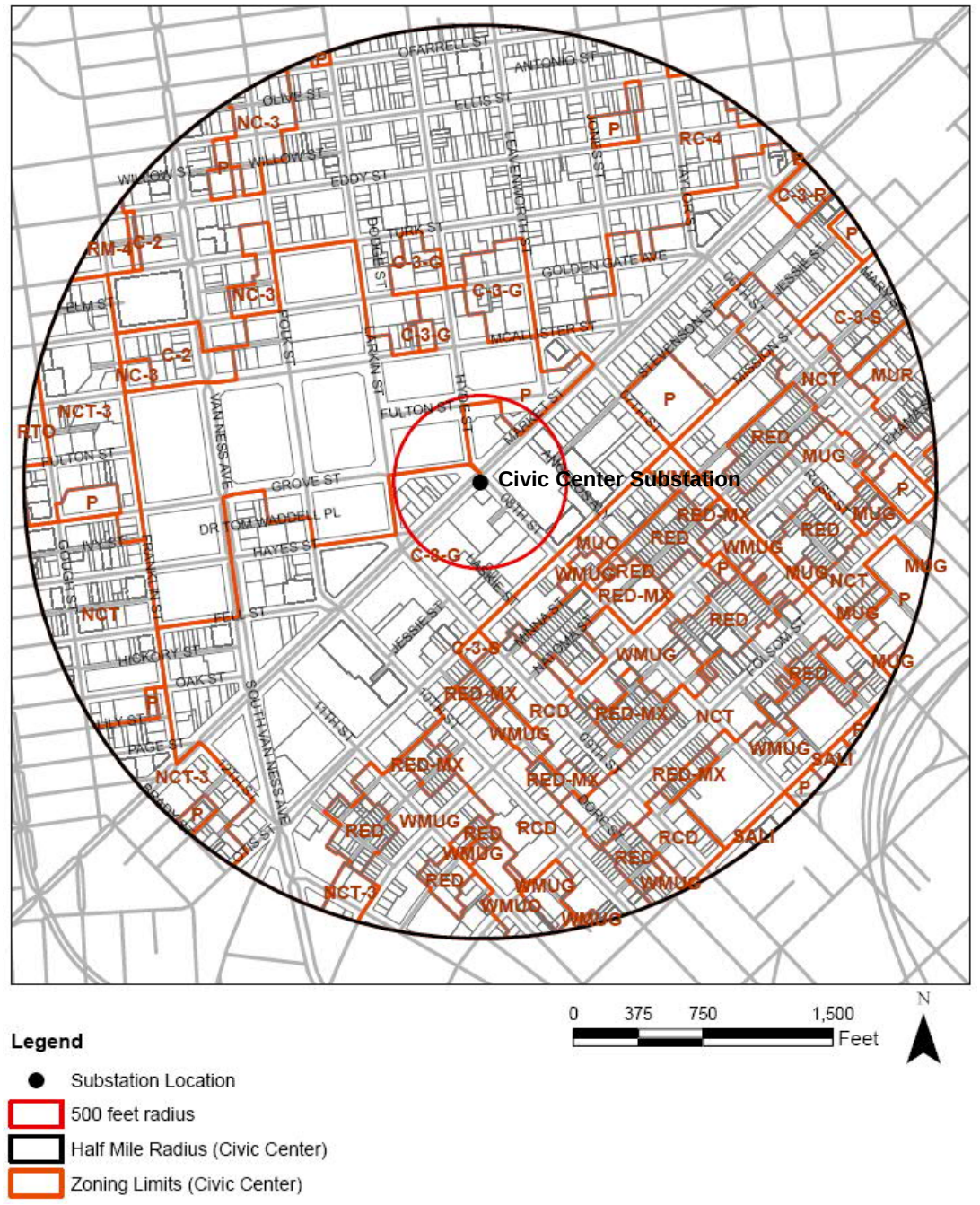
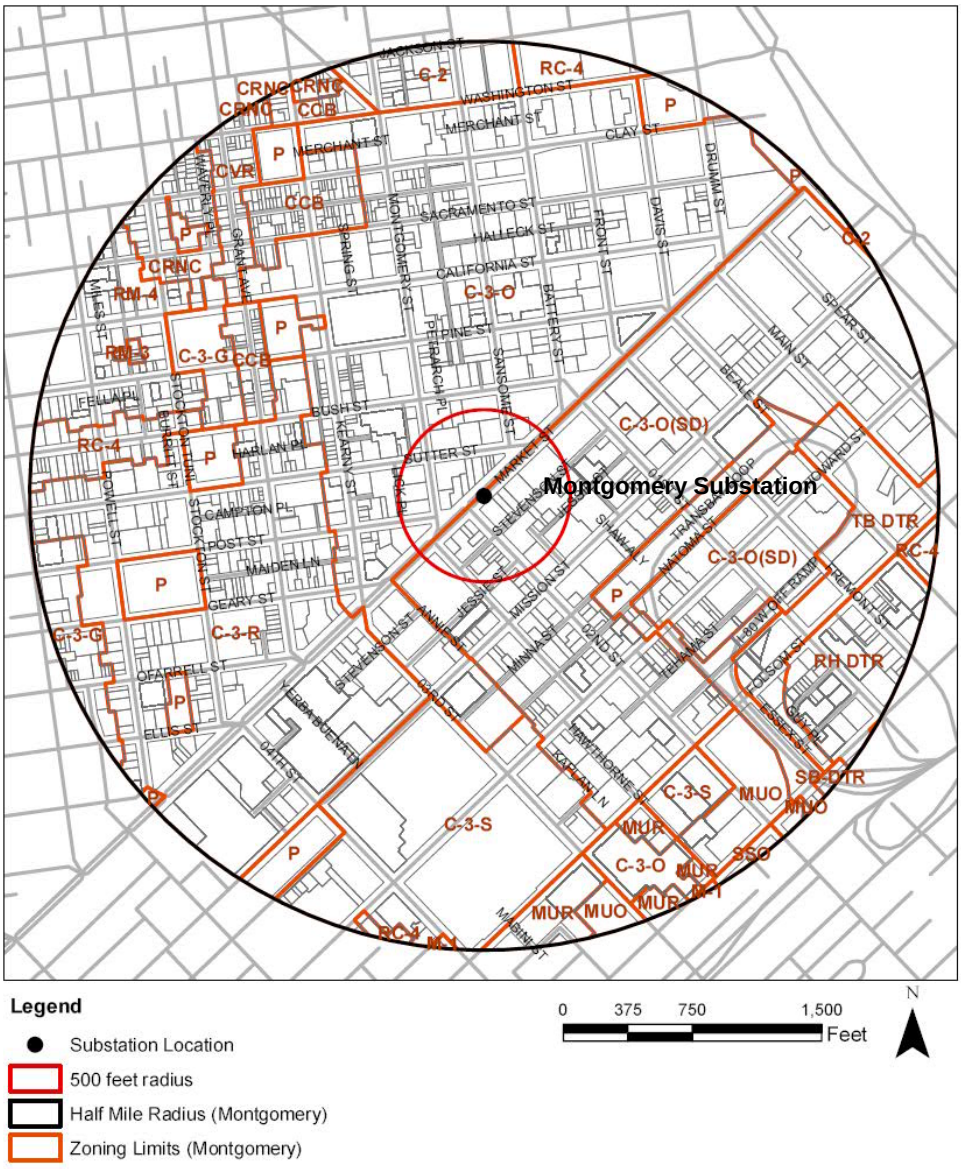


Figure 17: Adjacent Zoning to Downtown San Francisco Montgomery Substation



Zoning Categories according to the City and County of San Francisco Planning Code

Chinatown Mixed Use Districts
- *CCB: Community Business*
- *CRNC: Residential/Neighborhood*

Commercial
- *CVR: Visitor Retail*

Commercial District
- *C-2: Community Business*
- *C-3-G: Downtown General*
- *C-3-O: Downtown Office*
- *C-3-R: Downtown Retail*
- *C-3-S: Downtown Support*

Eastern Neighborhoods Mixed Use Districts
- *MUG: Mixed Use, General*
- *MUO: Mixed Use, Office*
- *MUR: Mixed Use, General*
- *WMUG: Western SoMa, Mixed Use, General*
- *WMUO: Western SoMa, Mixed Use, Office*

Neighborhood Commercial Transit Districts
- *NCT: Individual (Named, Controls vary)*
- *NCT-3: Moderate Scale*

Commercial Districts
- *RCD: Regional Commercial*

South of Market Mixed Use Districts
- *RED: Residential Enclave*
- *RED-MX: Residential Enclave Mixed Use*
- *SALI: Service/Arts/Light Industrial*
- *SSO: Service/Secondary Office*

Residential, Mixed (Houses & Apartments) Districts
- *RM-4: High Density (1 Unit per 200 sf)*

Residential Transit Oriented Districts
- *RTO: Residential Transit Oriented Development*

Industrial Light
- *M-1: Light Industrial*

Neighborhood Commercial Districts
- *NC-3: Moderate-Scale (3+ Commercial Stories)*

Public
- *P:* Public

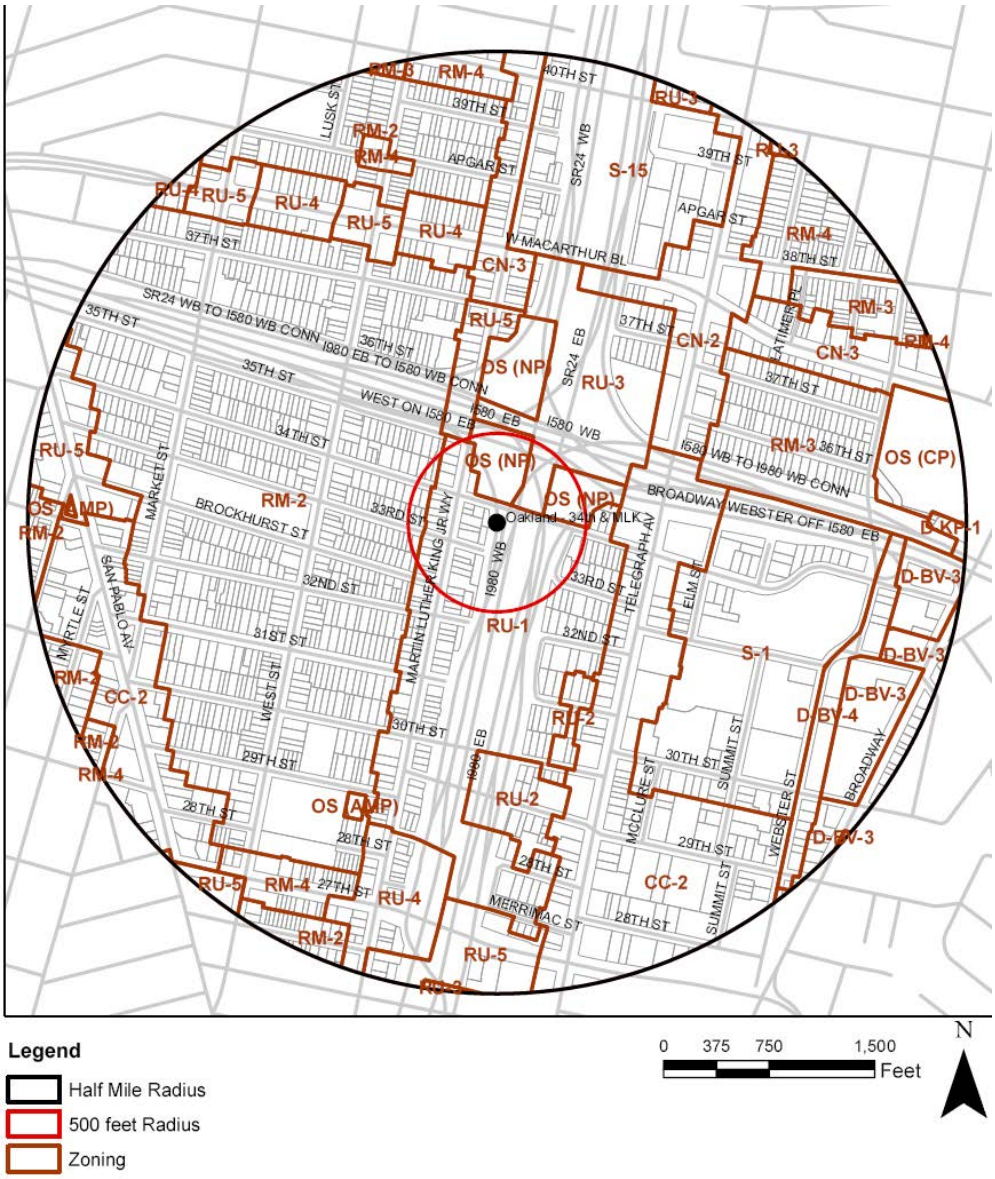
Residential, Mixed (Houses & Apartments) Districts
- *RM-3: Medium Density (1 Unit per 400 sf)*
- *RM-4: High Density (1 Unit per 200 sf)*

Downtown Residential District
- *RH DTR: Rincon Hill*
- *SB-DTR: South Beach*
- *TB DTR: Transbay*

Residential-Commercial Combined Districts
- *RC-4: High Density (1 Unit per 200 sf)*

The land surrounding the *Oakland - 34th Street and I-980 substation*, which is within Caltrans I-980 freeway right-of-way just south of 34th Street, is zoned Urban Residential (RU-1) according to Oakland Planning Code. Power substations are included in the use "Utility and vehicular Civic Activities".

Figure 18: Adjacent Zoning of Oakland 34th Street and I-980 Substation



Zoning Categories according to the City of Oakland Planning Code

CC: Community
CN: Neighborhood Center
D-BV: Broadway Valdez District
D-KP: Kaiser Permanente Oakland
OS-AMP: Active Mini-Park
OS-CP Community Park
OS-NP: Neighborhood Park
RM: Mixed Housing
RU: Residential Urban
S-1: Medical Center
S-15: Transit Oriented

The Concord David Avenue and Minert Road site is on BART right-of-way. No zoning is designated to this land in Concord Municipal Code. Power substations are included in the use "Utility facility transmission tower". Substations are allowed in areas with Residential zoning, which is the zoning for the properties across David Avenue from the proposed substation and adjacent to the Middle School across Minert Avenue from the proposed substation.

Figure 19: Adjacent Zoning of Concord David Avenue and Minert Road Substation

According to the City of Richmond Zoning Ordinance, land adjacent to the proposed *Richmond RYE Gap Breaker Conversion* Substation is zoned light industrial District (M2). Power substations are included in the use "Public utilities, major".

Figure 20: Adjacent Zoning of Richmond RYE Gap Breaker Conversion Substation

Zoning Categories according to the City of Richmond Planning Code

C-1: Neighborhood Commercial District
C-2: General Commercial District
CRR: Community and Regional Recreational District
M-2: Light Industrial District
MFR-1: Multifamily Residential District
MFR-3: Multifamily High Density Residential District
PC: Public and Civic Uses
SFR-3: Single-Family Low Density Residential District

Adjacent Uses

Existing land uses adjacent to the Downtown San Francisco TPSS locations include commercial (e.g.: retail, banks, restaurant, etc.), institutional, along with some multi-family residential along Market Street. Around the Downtown San Francisco Civic Center substation, public and institutional uses are dominant; these include library, park, schools, museum, governmental (city, state or federal) buildings. Downtown San Francisco Montgomery substation is located in the heart of the Financial District and offices are the main adjacent use. The proposed substations in downtown San Francisco are both entirely underground. The proposed vent grates for the TPSS are anticipated to be embedded in the sidewalk and will not have any visual impacts to the surroundings. No effects on adjacent uses are anticipated.

Existing land uses around the Oakland site in the I-980 right of way south of 34th Street include Interstate Highway (I-980), the BART tracks in the center of I-980, single and multi-families housing, and open spaces. The potential substation site is located under the existing freeway interchange ramp from EB I-580 to SB I-980, surrounded by multiple freeway columns. It will add a visual element among existing freeway support columns and other freeway and transportation facilities, between the existing residential uses to the west of the site and the I-980 freeway mainline to the east. Residential uses are shielded by the interspersed freeway columns, fencing and a row of trees. The TPSS would be placed in a context of transportation uses characterized by the presence of the freeway ramps overhead, and the freeway mainline and BART trackway to the east.

The immediate land uses adjacent to the Concord (David Avenue and Minert Road) Substation are two arterial roadways; that flank the BART trackway. The proposed substation is to be located within BART right-of-way across Minert Road from Oak Grove Middle School and will introduce a visual element between the school and the BART tracks. The existing land use north of David Avenue is single family housing (low-density residential), as is the land use on either side of the Oak Grove Middle School.

The proposed Richmond RYE Gap Breaker Conversion substation will convert BART's existing gap breaker station at the Richmond Yard to a TPSS. The site is contained entirely within BART's existing right-of-way near the intersection of Portola Avenue and 15th Street. Existing adjacent land uses include Class 1 railroad operations (Union Pacific and Amtrak), light industrial uses (BART railyard) and single family housing on the opposite side of Portola Avenue.

Table 3: Adjacent Zoning

Substations	Jurisdiction	Adjacent Zoning	City Zoning Classification
Civic Center Station	City and County of San Francisco	C3-G: Downtown General	"**Utility facility**" shall mean pipes, wires, tracks, conduits, tunnels, poles or other overhead supporting structures, with any appurtenances, or any other structures of any nature, upon, in, over or **under the streets** or places of the City and County of San Francisco which are used for the purpose of supplying or conveying any services or substances within the limits of the City and County of San Francisco
Montgomery Station	City and County of San Francisco	C3-O: Downtown Office	
Oakland I-980 & 34th street	City of Oakland	RU-1: Urban Residential	Zoning Code art. 17.19.030 Utility and vehicular civic activities. […] include the maintenance and operation of the following installations: B. Electrical Substations

Substations	Jurisdiction	Adjacent Zoning	City Zoning Classification
Concord – David Avenue and Minert Road	City of Concord	BART right of way - No Zoning in Concord Plan	"Utility facility, transmission towers" means a facility that provides a fixed base structure or facility serving as a junction point for transferring electric utility services from one transmission voltage to another or to local distribution and service voltages, and similar facilities for water supply and natural gas distribution. These uses include any of the following facilities that are not exempted from land use permit requirements by Government Code Section 53091: Electrical substations and switching stations, etc.
Richmond RYE Gap Breaker Conversion	City of Richmond	M2: Light Industrial District	Public utilities, major means generating plants, **electrical substations**, switching buildings, refuse collection processing, recycling or disposal facilities, water or waste treatment plants, and similar facilities of public agencies or public utilities.

The TPSS facilities and CBTC would be placed in areas already used predominantly for transportation purposes. They would be in BART or Caltrans right-of-way located next to BART's existing tracks and thus, such uses are consistent with existing zoning and land use. Typical TPSS facilities contain electrical equipment housed in pre-fabricated metal enclosures of rectangular shape approximately 12 feet in height, 40 feet wide, and 60 feet long. The project would not have any impacts on land use and zoning.

E. TRAFFIC AND PARKING IMPACTS

The program would not have any impacts on on-street or off-street parking because the improvements would be in either BART's or Caltrans' existing transportation right-of-way in areas not accessible to the public for automobile use. It would not change existing parking at BART stations, feeder bus service serving BART stations, or roadway lanes and signals. There would be no permanent loss of on-street or off-street public parking.

The program would expand Transbay Corridor rail capacity to meet existing demand and relieve overcrowding on trains. It will also position BART to better accommodate ridership growth, consistent with growth trends in the Bay Area. Plan Bay Area projects population to increase by 30% by 2040, much of which will be located close to BART stations.

F. CO HOT SPOTS

The Counties of Alameda, Contra Costa, San Francisco, San Mateo and Santa Clara are in a Federal attainment/maintenance area for CO and, also in attainment on the State level.

Since the project is in a Federal maintenance area, the project cannot have CO impacts substantial enough to cause violations of standards. A proposed project is likely to have an acceptable level of emissions compared to a No-Build condition if it is determined that it meets the following criteria:

- The project does not substantially increase (greater than two percent) the number of vehicles operating in cold start mode (starting a vehicle with a cold engine).

- The project does not substantially increase traffic volumes (i.e., increases greater than five percent).
- The project improves traffic flow (i.e., higher average speeds (up to 50 miles per hour) should be regarded as an improvement for uninterrupted roadways.
- A project that causes an insignificant increase in emissions may only be deemed satisfactory if the project does not move traffic closer to a receptor.

The expansion of the BART fleet by adding an additional 306 cars and other elements of the Transbay Corridor Core Capacity Program would meet all the criteria listed above. The railcars being procured for the program are electrically-powered and do not create emissions. The project is anticipated to relieve current overcrowding onboard trains and provide additional capacity for new transit riders, which could lead to reduced VMTs. Thus, the program would not cause any new localized CO exceedances of federal standards, generate emissions that would worsen existing violations or delay timely attainment of standards. On August 24, 2017, MTC's Air Quality Conformity Task Force agreed that the program is not a project of air quality concern.

G. HISTORIC RESOURCES

Historic resources will not be affected by the project. Installation of a new CBTC train control system will be contained wholly within BART's existing right-of-way and station structures, and will not affect historic resources.

HMC Phase 2 –was assessed in the Final Negative Declaration [**Appendix A**] and addenda for HMC [**Appendix B** and **Appendix C**], which concluded that Phase 2 of the facility would have no impacts on historic resources. The Negative Declaration notes that research, reviews of historic maps and aerials, and a pedestrian survey did not indicate the presence of known historical resources within the project site or within a ½-mile radius of the site and the track work area south of Whipple Road.

The new TPSS facilities are all within existing BART or Caltrans right-of-way. No historic resources will be affected. The three new East Bay TPSS sites are not located within or near a historic district or property. These three substations will not result in any substantive changes to the landscape or view shed proximate to these rights-of-way. The following sections provide more detail on the two new traction power substations in San Francisco, and support the conclusion of no impact.

Area of Potential Effects (APE)

The National Historic Preservation Act (NHPA) of 1966, as amended (16 USC § 470, et seq.) requires the FTA to take the effects of its undertakings on historic properties into account. As part of the Section 106 process, a geographic buffer is developed to assess impacts on cultural resources and referred to as an Area of Potential Effects (APE).

An Area of Potential Effects (APE) was developed to review the existing historic resources in relation to the new project elements. Since the two downtown San Francisco TPSS facilities are entirely within current underground station structures, the APE for the San Francisco structures is the sidewalk area that will include access points and ventilation grates on the surface, all embedded in the current operational footprint. Therefore, no ground level visual buffer was assumed as part of the development of the APE.

Historic Structures and Districts

The two TPSS facilities in San Francisco would be located within current underground station structures. The *Downtown San Francisco Civic Center* substation would be located in the *San Francisco Civic Center Historic District* according to Article 10 of the Planning Code of the City and County of San Francisco and the National Register of Historic Places (NRHP). There are also

existing historical landmarks within a 1000 feet radius from the *Civic Center* and *Montgomery* substations. The Historic District and Landmarks are identified in **Table 4** (**p. 33**), **Table 5** (**p. 34**), **Figure 21**, (**p.35**), and **Figure 22** (**p.35**)Since substations will be located entirely underground; the substations will not have any effect on historical landmarks or districts.

Each of the two new substations in downtown San Francisco will require new vent grates for ventilation purposes. The anticipated vent grates are to be embedded in the sidewalk pavement at-grade similar to existing vent grates, and are not expected to introduce any visual elements along the Market Street corridor. The initial design of the vent structures was closely reviewed for any potential impacts to the Market Street historic district and/or to adjacent historic structures. BART is collaborating with the City and County of San Francisco regarding the number, location, size, and exterior appearance of these facilities and is committed to have the design be context sensitive in its use of materials. The final decisions will be made during final design.

At Civic Center, two existing passenger entrance portals will be removed to facilitate the placement of the TPSS underground. One of these entrances, near the corner of Market Street and Grove Street, is within the Civic Center Historic District. The removal of this portal structure would not have any adverse visual effect. An overall improvement to the visual quality is anticipated. Based upon a conversation that took place between FTA and the California State Historic Preservation Office (SHPO) on November 17, 2016, BART will not need to consult with the SHPO regarding the closure of the station entrance at Market and Grove Streets in San Francisco's Civic Center Historic District. No contributing structures are being removed, no new structures are being constructed, and there will be no expansion of the station or increased depth of disturbance associated with the installation of the TPSS. Additionally, the station entrance itself does not contribute to the significance of the historic district. Therefore, the closing of the entrances will have no adverse impact on the historic district.

As mentioned earlier, for Montgomery and Civic Center Substations, the TPSS ventilation would be through grates embedded in the sidewalk, at-grade. Design of the grates would be context sensitive. The surface level grates embedded in the sidewalk will not create any adverse visual impact to historic resources in the surrounding area.

Sources used for this analysis include the GIS database from the City and County of San Francisco[5] Planning Department and the GIS database from the NRHP[6], which includes both nationally and locally designated historic resources.

Table 4: List of Historic Districts in the Vicinity of the Proposed Civic Center TPSS

	Name	Listed under…	Boundaries	Station Included
A	**San Francisco Civic Center Historic District**	NRHP (78000757) and Article 11	Roughly bounded by Golden Gate Ave., 7th Street, Franklin, Hayes and Market Street	Civic Center

[5] City of San Francisco, *Map of the Landmarks and Landmark Districts as defined and listed in Article 10 of the San Francisco Planning Code*, available online: https://data.sfgov.org/Housing-and-Buildings/Landmarks/8ynb-89vj
[6] National Register of Historic Places, *Public, non-restricted data depicting National Register spatial data processed by the Cultural Resources GIS facility*, Available online: https://www.nps.gov/maps/full.html?mapId=7ad17cc9-b808-4ff8-a2f9-a99909164466

Table 5: List of Historic Buildings and Designated Landmarks in the Vicinity of the Proposed Civic Center TPSS[7]

	Name	Listed under…	Address	Close to which substation	Distance (feet)[8]
1	**Orpheum Theater Building**	Article 10 (#94)	1192 Market Street	Civic Center	215

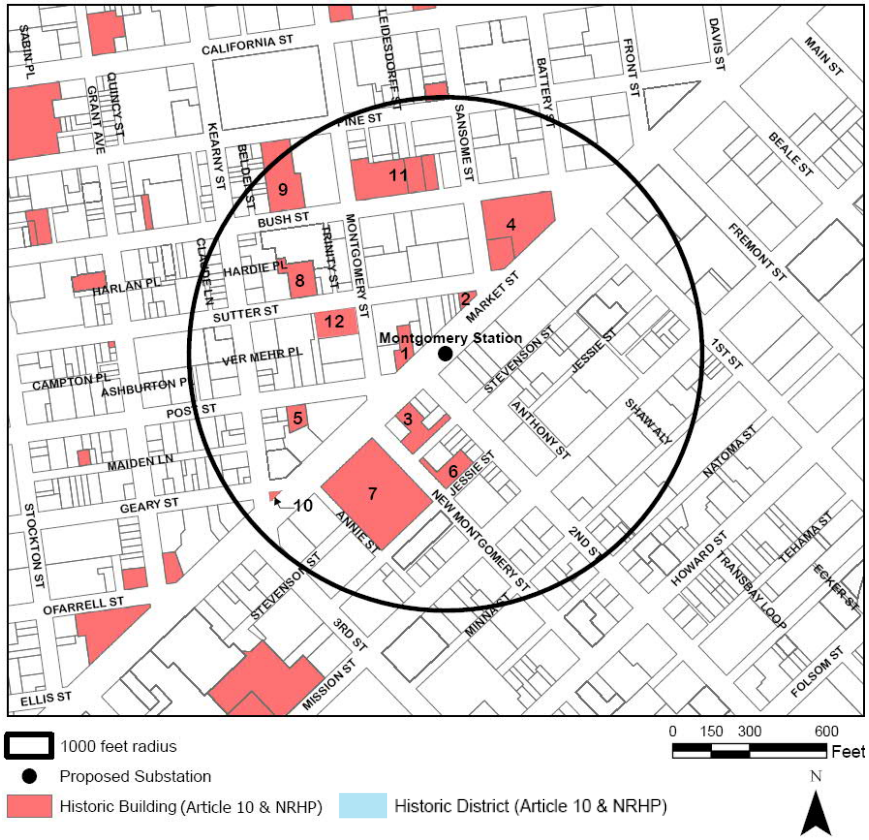
Table 6: List of Historic Buildings and Designated Landmarks in the Vicinity of the Proposed Montgomery TPSS9

	Name	Listed under…	Address	Close to which substation	Distance (feet)[10]
1	**Hobart Building**	Article 10 (#162)	582 Market Street	Montgomery	255
2	**Flatiron building**	Article 10 (#155)	1 Sutter Street	Montgomery	175
3	**Hoffman's Grill**	Article 10 (#144)	619 Market Street	Montgomery	340
4	**Crown Zellerbach Building**	Article 10 (#183)	1 Bush Plaza	Montgomery	315
5	**The Mechanics Institute**	Article 10 (#134)	57 Post Street	Montgomery	655
6	**Sharon Building**	Article 10 (#163)	36-63 New Montgomery Street	Montgomery	390
7	**Palace Hotel and Garden Court Room**	Article 10 (#18)	2 New Montgomery Street	Montgomery	640
8	**Hallidie Building**	Article 10 (#37) and NRHP (71000185)	130 Sutter Street	Montgomery	630
9	**SF Mining Exchange**	Article 10 (#113)	350 Bush Street	Montgomery	895
10	**Lotta Fountain**	Article 10 (#73) and NRHP (75000475)	Kearny Street	Montgomery	760
11	**Mills Building & Tower**	Article 10 (#76) and NRHP (77000334)	220 Montgomery Street	Montgomery	625
12	**Hunter-Dulin Building**	NRHP (97000348)	111, Sutter Street	Montgomery	390

[7] Source: NRHP GIS data and City and County of San Francisco GIS Data.
[8] Distances were calculated approximatively with Google Earth Tools.
[9] Source: NRHP GIS data and City and County of San Francisco GIS Data.
[10] Distances were calculated approximatively with Google Earth Tools.

Figure 21: Historic Buildings and District in Vicinity of Civic Center TPSS

Figure 22: Historic Buildings in the Vicinity of Montgomery TPSS



** Historical buildings and districts are listed and numbered in the tables above*

Archaeological and Native American Cultural Resources

Installation of the new CBTC train control system and the procurement of railcars are wholly within BART's existing rail and station right-of-way and operating envelope, and will have no impact on archaeological and Native American cultural resources.

For HMC Phase 2, the Negative Declaration [**Appendix A**] and the addenda for HMC **[Appendix B** and **Appendix C**] assessed the potential impacts on archeological and Native American cultural resources. The project, as defined, would not have any adverse effects on archeological and Native American cultural resources.

For the TPSS facilities, the proposed locations of the substations are all wholly within existing station structures or are in a previously excavated (disturbed) context for railroad or highway construction. Therefore, no effects to archeological and Native American resources are anticipated.

The two San Francisco TPSS facilities are wholly within the existing station structures for Civic Center and Montgomery stations. No excavations are anticipated, and the only surface disruption would be to rebuild small sections of the sidewalk on Market Street for the ventilation grates. The Market Street right-of-way has already been highly disturbed to a depth of approximately 80-100 feet for cut-and-cover construction of the underground BART system and stations in the 1960s and 1970s, and for modifications to the Market Street roadway and sidewalk.

The three East Bay TPSS facilities will be constructed within existing transportation rights-of-way that have already been disturbed for railroad, roadway, freeway and overpass construction. The Concord site was first disturbed when a railroad right-of-way was constructed on this alignment, and it was further disturbed in the 1960s when the right-of-way was rebuilt as BART. The Richmond site was first constructed as a railroad right-of-way , and was rebuilt for BART in the 1960s. The Oakland site was significantly disturbed beginning in the 1960s during construction of SR-24, I-580 and I-980. The site features multiple columns and footings for the freeway overpass structures that are overhead, and the site was graded and resloped to allow the adjacent freeway to be built in a below-grade trench configuration.

However, in an event that previously undisturbed soils are encountered, the following may be required:

- *Avoidance of Discovered Cultural Resources and Measures to Reduce Harm*: If evidence of an archaeological site or other suspected historic resource is encountered during construction, including darkened soil representing past human activity ("midden") that could conceal material remains (e.g., worked stone, faunal bone, hearths, or storage pit), all ground-disturbing activity within 100 feet of the find shall be halted and BART notified. BART will hire an archaeologist meeting the Secretary of the Interior's Standards for Professional Archaeologist to assess the find. Impacts to any significant resources may be mitigated through avoidance, data recovery, or other methods determined adequate by the qualified archaeologist and that are consistent with the Secretary of the Interior's Standards for Archeological Documentation. Any mitigation plan developed by the qualified archaeologist shall be approved by BART prior to implementation. Project-related ground-disturbing activities shall not be continued in the vicinity.

- *Avoidance of Discovered Human Remains and Measures to Reduce Harm:* If human remains, including disarticulated or cremated remains, are discovered during any phase of construction, all ground-disturbing activities in the vicinity and any nearby area reasonably suspected to overlie adjacent human remains shall be immediately halted. BART and the relevant County Coroner shall be notified immediately, in accordance with the Section 5097.98 of the State Public Resources Code and Section 7050.05 of California's Health and Safety Code. If the remains are determined by the county coroner to be Native American, it is the responsibility of the county coroner to inform the Native American Heritage Commission (NAHC) within 24 hours. The guidelines of the NAHC should be adhered to in the treatment and disposition

of the remains. BART shall retain a qualified archaeologist who meets the Secretary of the Interior's Standards for Professional Archaeologist and with Native American burial experience to conduct a field investigation of the specific site and consult with the person identified as the Most Likely Descendent, if any, identified by the NAHC. BART shall approve any mitigation recommended by the qualified archaeologist prior to implementation, taking account of the provisions of State law as set forth in the CEQA Guidelines Section 15064.5(e) and Public Resources Code Section 5097.98. Approved mitigation must be implemented before resumption of ground-disturbing activities in the vicinity.

In such cases, coordination with the SHPO and consultation with Native American tribes will be required. However, there are no potential archeological discoveries anticipated due to the already developed nature of the locations of the project elements.

H. NOISE

In October 2016, a Noise and Vibration Technical Report was completed to assess the potential for ongoing airborne noise impact to noise-sensitive land use located in the proximity to new and refurbished TPSS and the new communication-based train control system [**Appendix I**]. Screening distances were used from the candidate sites for new and upgraded TPSS to assist with the initial evaluation of potential noise impacts and site visits were conducted on March 17 and June 8, 2016 for the East Bay and March 30 and June 23, 2016 for San Francisco.

Table 7: List of noise sensitive receptors and the closest distance to the TPSS site

TPSS Location	Sensitive Use	Distance to Nearest Receptor (feet)
Downtown San Francisco - Civic Center	Residential with no open windows, Orpheum Theater, Public Library, and City College	15*****
Downtown San Francisco - Montgomery	Urban with few sensitive land uses	15*****
Oakland 34th Street and I-980	Residential and Grove Shafter Park	85
Concord - David Avenue and Minert Road	Residential and Oak Grove Middle School	110
Richmond - RYE Gap Breaker Conversion	Residential	100

**Distance from ventilation system intake or discharge grill in sidewalk with receptor at approximately > 15 feet from grill.*

Noise-sensitive uses were identified for each potential TPSS site and measurements of existing ambient noise measurements were conducted at the East Bay locations between June 20 and 24, 2016. Six long-term (24 hours or longer) measurements were conducted and nine short-term (typically 15 minutes) measurements were performed. Measured long-term existing average day-night sound levels (L_{dn}) varied between 64 and 76 decibels. The calculated L_{dn} levels for the short-term measurement locations varied from 57 to 83 decibels.

Existing baseline community noise information developed by the City and County of San Francisco in 2008 was used for the San Francisco TPSS locations. Modeled L_{dn} levels based on the City and County of San Francisco database indicated that levels vary between 74 and 76 decibels.

Because the specific equipment and layout of each final TPSS location has not yet been determined, it is not possible to accurately predict the TPSS noise emission levels and calculate noise impacts at the time of the preparation of this report. BART's practices in TPSS design is to develop the TPSS component specifications, equipment layout and ancillary features such as a perimeter screen wall that would avoid impacts to the vicinity of the final TPSS locations. This approach is consistent with

the process used for the Warm Springs Extension. The Noise and Vibration Technical Memorandum provides noise impact avoidance criteria at the approximate boundary of each TPSS site as referenced in Section 3.4.2 and Table 3-4 with TPSS acoustic noise emission performance consistent with the limit criteria levels, the project will avoid noise impacts at any identified noise-sensitive land uses in the vicinity of the TPSS facilities.

Design and installation best practices will help TPSS sites perform within or under the noise thresholds. BART (or its contractor) will monitor the noise levels post deployment. Noise levels will be compared with the thresholds, and a sound wall or other noise reduction mechanisms will be installed if the threshold is exceeded. Operations and performance standards of recently installed TPSS (e.g., Warm Springs) will additionally inform this entire process of design, installation and operations.

No perceptible noise is expected from operation of the communication-based train control system.

HMC was the subject of a separate noise report done by Wilson Ihrig in 2011 **[Appendix K**], and updated by Wilson Ihrig in 2014 [**Appendix L**] and 2017 [**Appendix M**]. The latest review found that the noise levels in areas adjacent to HMC Phase 2 would not exceed the FTA threshold for Moderate Impacts and thus, no impacts are anticipated. In the original Negative Declaration, Phase 2 was to include a soundwall (SW-3) to be built at the property line to shield residences north of the site. In Addendum 2, based on Wilson Ihrig's 2014 analysis, the sound wall was moved from the property line and replaced with a short wall atop an existing ramp structure in approximately the same relationship to the adjacent residences. In its 2017 analysis, Wilson Ihrig determined that the ramp structure itself was sufficient to avoid a moderate impact, without the short wall on top. The original Negative Declaration also determined that another soundwall (SW-4) would be needed for Phase 2. SW-4 has already been built as part of Phase 1. Therefore, since all required sound walls were already built during Phase 1, no additional sound wall would be built under HMC Phase 2.

I. VIBRATION

The Negative Declaration [**Appendix A**] and addenda for HMC **[Appendix B** and **Appendix C**] assessed the potential impacts on vibration. The project as defined includes several design and best practices measures that will be implemented to ensure that there are no vibration impacts. Measures to reduce the effect of vibration include vibration reducing technology and construction vibration best management practices.

The program does not involve new or relocated trackway outside of HMC Phase 2. Operation of neither the TPSS nor the communication-based train control system will generate any ground-borne vibration impacts. Temporarily elevated vibration levels could result from construction activities associated with reworking and constructing new TPSS. These activities may include demolition, grading, minor excavation, foundation fabrication, paving and installation of systems components. No high vibration producing activity such as pile driving is anticipated to be necessary for the installation of the TPSS or the CBTC equipment. While the construction vibration may be briefly elevated, the change would not be substantial and would not create significant impacts[11].

J. ACQUISITIONS & RELOCATIONS REQUIRED

Implementation of the program will be on BART and Caltrans right-of-way. It will not result in displacements of residences or businesses. Caltrans is supportive of the use of their property based on the initial conversations between BART and Caltrans and a field meeting at the site on August 15, 2016. No full acquisitions or easements are required. BART has begun the process of negotiating a cooperative agreement with Caltrans for use of I-980 right-of-way for the Oakland 34th Street and I-980.

[11] Appendix H: Core Capacity Noise and Vibration Technical Memorandum, October 2016, p.37.

K. HAZARDOUS MATERIALS

The Final Negative Declaration [**Appendix A**] and addenda for HMC [**Appendix B** and **Appendix C**] assessed the potential for encountering hazardous materials. Although there are no known sources of groundwater pollution on the HMC site, the HMC Negative Declaration includes mitigation provisions if unknown contamination is discovered that includes remediation of contaminated sites prior to construction. The Negative Declaration makes note of a previous spill of chemicals stored in underground storage tanks on the Univar (formerly Chem Central) property, approximately 1/8 to 1/4 mile south/southwest of the HMC site. The contamination is not on HMC site, and the contamination plume is moving away from the HMC site. No effects are anticipated.

None of the proposed substations would be located on sites identified by the State Water Resources Control Board (SWRCB) as presenting contamination[12]. Thus, no effects are anticipated at the time.

Based on current land use, the TPSS site located in Richmond has a potential risk of contamination due to its proximity to railyard. Metal, oil and gasoline contamination is often encountered in railyards. However, the installation of a TPSS involves only minimal subsurface ground disturbance. Therefore, no encounters with hazardous materials are anticipated. Any identified environmental site conditions that may represent a risk to public health and safety will be remediated in accordance with federal, state, and local environmental laws and regulations. The appropriate federal, state and local parties would be notified if site conditions that represent a risk to public health are identified.

Record Search

The California SWRCB GeoTracker website was searched for publicly available records for cleanup sites in the Leaking Underground Storage Tank (LUST) and Cleanup Program databases. The GeoTracker website also includes documentation for the Department of Toxic Substances Control (DTSC) EnviroStor database as a separate layer. Sites that were identified in close proximity to the TPSS sites on the GeoTracker website were reviewed to obtain information and documents regarding the known or potential extent of contamination related to those facilities.

Civic Center TPSS

The GeoTracker website identified three listings, which constituted one property within the vicinity of the Civic Center TPSS location. The property at 1169 Market Street in San Francisco is in the EnviroStor and LUST database. The 4-acre site is situated east of the intersection of Market Street and 8th Street, adjacent east of the Civic Center TPSS site. According to a 2003 Voluntary Action Agreement with DTSC, the property contained a waste paint consolidation area. The first LUST incident was closed in 1995. The results of the DTSC voluntary action review to determine whether additional characterization and/or cleanup of the property is unknown. Another UST was discovered during construction activities in May 2016. This UST was found to be leaking; however, adequate impacted soil was removed from the premises, and the incident was closed in July 2017.

Montgomery Station TPSS

Two nearby listings were found within the GeoTracker website, which constituted one property near the Montgomery Station TPSS site. The Former Chevron Building at 555/575 Market Street is adjacent southeast of the TPSS site and in the LUST database. The first LUST incident was discovered in 1996 and the facility received a Closure/No Further Action Level in 1997. The second LUST incident was discovered in 1998 and the facility was issued a closure in July 2000.

The listings noted above will not have any direct or indirect effects on the two underground TPSS sites in downtown San Francisco in Civic Center and Montgomery Stations. Installation of the two

[12] State Water Resources Control Board (Geotracker) *http://geotracker.waterboards.ca.gov [Accessed on April 10, 2016]*

TPSS sites will occur entirely within the existing station boxes and will not involve any excavation of soil.

Oakland south of 34th Street in I-980 right-of-way

The GeoTracker website did not identify any facilities within close proximity of the Oakland TPSS site.

Concord David and Minert Road:

The GeoTracker website did not identify any facilities within close proximity of the Concord TPSS site.

Richmond RYE Gap Breaker

The GeoTracker website did not identify any facilities within close proximity of the Richmond TPSS site. As already mentioned in the chapter text, this TPSS is in close proximity to a railyard, which is a potential concern due to heavy metals, volatile organic compounds, semi-volatile organic compounds, pesticides, and herbicides (for weed suppression).

In case larger excavations are required at any of the substation sites, any potential impacts can be addressed through standard measures below:

- Further Soil and Groundwater Investigations Prior to any Construction Activities
- Remediation of Contaminated Sites Prior to Construction
- Cease Work in the Event of Discovered Environmental Contamination During Construction.

L. COMMUNITY DISRUPTION AND ENVIRONMENTAL JUSTICE

BART, as a recipient of federal funds, is required by the FTA to comply with Title VI of the Civil Rights Act of 1964 and its amendments (Act). Title VI of the Civil Rights Act of 1964 requires that no person in the United States, on the grounds of race, color or national original be excluded from, be denied the benefits of, or be subjected to discrimination, under any program or activity receiving federal financial assistance. Presidential Executive Order 12898 "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" addresses environmental justice in minority and low income populations. Presidential Executive Order 13166 "Improving Access to Services for Persons with Limited English Proficiency" addresses services to those individuals with Limited English Proficiency (LEP).

FTA Circular 4702.1B, dated October 1, 2012, entitled *Title VI Requirements and Guidelines for Federal Transit Administration Recipients* (Title VI Circular) and FTA Circular 4703.1, dated August 15, 2012, entitled *Environmental Justice Policy Guidance for Federal Transit Administration Recipients* (EJ Circular), require that federal funding recipients, such as BART, review its transportation decisions to ensure equity in the transportation decision making process and to ensure that decisions are not made on the basis of race, color, national origin or socioeconomic status.

The existing BART system covers large portions of the Bay Area and bisects a number of communities, including designated minority and low-income populations. Below is an analysis of potential impacts, if any, from the project on Title VI/Environmental Justice (EJ) communities.

Expansion of the railcar fleet (306 vehicles)

Passengers will benefit from the additional revenue vehicles which will lead to less crowding and increased train frequencies distributed throughout the BART system. The actual train operating schedules will be established closer to the project opening date and staff will make every effort to

ensure equitable distribution of vehicles. Additionally, the Title VI service monitoring process reviews vehicle assignments throughout the system for equity considerations every three years as part of BART's Title VI Triennial Review for the FTA. Because the planned equitable distribution of rail vehicles will be a benefit to all passengers, there are no impacts anticipated. Therefore, no disproportionately high and adverse effects to Title VI/EJ communities are anticipated.

Phase 2 of Hayward Maintenance Complex (HMC)

HMC Phase 2 was the subject of a separate Categorical Exclusion [**Appendix D**] issued on September 21, 2011 by the FTA. The Negative Declaration **[Appendix A**] and the CE plus addenda **[Appendix B** and **Appendix C**] for HMC are incorporated into this document by reference. HMC was also part of a separate Environmental Justice (EJ) analysis that includes an analysis of the protected communities that could be affected by the HMC. The EJ analysis was submitted to the FTA along with the HMC Initial Study/Mitigated Negative Declaration in 2011. **Appendix N** presents the EJ analysis. Neither Phase 2 of HMC nor the environment affected by HMC Phase 2 have changed since 2011. The project as defined in the EJ Analysis incorporates measures to avoid, minimize, or mitigate adverse effects to the Title VI/EJ communities. For specific details on the measures, please refer to page 21 of **Appendix N**. Because there have been no changes to the project or environment since 2011 and per the EJ Analysis, the project has incorporated measures to avoid, minimize or mitigate adverse effects, there are no remaining impacts anticipated. Therefore, no disproportionately high and adverse effects to Title VI/EJ communities are anticipated.

Communications-Based Train Control (CBTC)

The CBTC equipment in operation will not make any noise, and it will be largely invisible to the public. The CBTC equipment will be entirely in existing transportation right-of-way and existing structures. No impacts from installation or operation of CBTC equipment are anticipated. Therefore, no disproportionately high and adverse effects are anticipated for any surrounding communities, including Title VI/EJ communities.

Traction Power Substations

Demographic Setting

A GIS analysis was performed to review the demographic characteristics of the communities around the five proposed TPSS sites. The affected geographic area by the project includes uses directly adjacent to the TPSS sites. For the purposes of this evaluation, the affected geographic area has been delineated by the Census Block Groups within a half mile buffer of every TPSS.

Two aspects that define EJ communities were analyzed for the census block around the substations:

- Low Income Population: Individuals whose income is at or below 200 percent of the poverty level established for households by the Department of Health and Human Services (HHS) poverty guidelines. This assumption is more inclusive of low-income populations, accounting for higher incomes in the Bay Area as compared to the rest of the United States. The 200 percent threshold is also consistent with the assumptions employed by the MTC in its February 2009 Equity Analysis Report.
- Minority Population: All people except for Non-Hispanic white as defined by the US Census. This includes persons who self-identified themselves as American Indian or Alaskan Native, Black or African American, Native Hawaiian or other Pacific Islander, or Hispanic or Latinos.

To identify Minority and Low Income populations geographically, a percentage threshold based on the total population within the BART four-county service area was determined. Using the 2010 Census data, the percentage of Minority population within the BART systems is 59% and the percentage of Low Income population is 26%. If the Minority or the Low-Income population of the

Census Block Group (community) within the Affected Geographic Area was greater than the BART service area percentage, then the community was identified as a Minority or Low Income Census Block Group.

Table 8 and **Table 9** show a summary of the findings for the Census Block of each proposed TPSS site. Maps and complete tables per substation location and Census Block are presented in **Appendix O**.

Table 8: Low Income Communities near Proposed TPSS

Substations	Total Population[13]	Low Income Population	Percentage of Low Income Population	EJ Low Income Community?
Civic Center	54,187	27,779	52,0%	Yes
Montgomery	42,259	19,044	45,1%	Yes
Oakland 34th Street and I-980	21,943	10,140	46,2%	Yes
Richmond RYE Gap Breaker	21,119	12,508	59,2%	Yes
Concord Minert Road	14,643	2,384	16,3%	No

Table 9: EJ Minority Communities near Proposed TPSS

Substations	Total Population[14]	Minority Population	Percentage of Minority Population	EJ Minority Community?
Civic Center	54,187	35,522	65,6%	Yes
Montgomery	42,259	19,044	64,5%	Yes
Oakland 34th Street and I-980	21,943	14,738	66,0%	Yes
Richmond RYE Gap Breaker	21,119	20,240	95,2%	Yes
Concord Minert Road	14,643	5,959	16,3%	No

Four out of five of the proposed TPSS locations are in Census tracts characterized as Title VI/EJ communities. These four TPSS sites are Civic Center, Montgomery, Oakland 34th Street and I-980 and Richmond RYE Gap Breaker.

Determination of Effects

Traction power substations currently exist at approximately 76 locations throughout the BART System, and are situated proportionally in locations necessary to provide the power distribution necessary to operate the System. Traction power substations cannot be concentrated in one particular portion of the System; they must be distributed throughout the System at regular intervals to be effective and must be placed in areas where low voltage is expected. As substations are distributed across the entirety of the BART System in both Title VI/EJ and non-Title VI/EJ communities, the proposed Transbay Corridor Core Capacity Program improvements do not specifically benefit nor disproportionately impact one community over another.

The planned substations are located on existing BART and Caltrans right-of-way within the current fenced trackway or fenced existing highway right-of-way not accessible to the public, or underground in BART's existing station facilities. Thus, these new substations will not divide any community, affect or alter its character or have the potential to disrupt any community activities.

[13] Total Population in half mile radius around substation

The noise and vibration analysis studies BART performed determined that the new traction power substations would not perceptibly increase existing noise levels along the corridor, and accordingly, no impacts are anticipated. Therefore, no disproportionately high and adverse effects are anticipated for any surrounding communities including Title VI/EJ communities.

Any fences or walls that are erected to obscure traction power substations will be equitable in materials, finishes and style to other similar facilities located in non-EJ communities. No adverse visual impacts are anticipated. Therefore, there are no disproportionately high and adverse visual effects to Title VI/EJ communities.

The projected elements in the CE are within existing transportation right-of-way with systems that are currently operational. Core Capacity project improvements will deliver direct and tangible travel time and reliability and overall mobility benefits to all riders of the system including Title VI/EJ populations that use the BART system.

While 4 out of the 5 proposed TPSS locations are in Title VI/EJ Communities, the analysis above finds that the proposed locations do not disproportionately or adversely impact Title VI/Environmental Justice communities. For any potential impacts that were found, feasible measures were included in the project that would eliminate or reduce the adverse effects to acceptable levels.

Finally, locations for TPSS were determined using objective criteria based on engineering and operational specifications. The distribution of these TPSS facilities adhere to BART's Environmental Justice Policy (2012) which ensures that, "decisions related to vehicle replacement and new investments, or changes in transit facilities, deliver equitable levels of service and benefits to minority and low-income populations." As mentioned above, TPSS are located throughout the entirety of the BART system in both Title VI/EJ and non-Title VI/EJ communities. The TPSS are necessary to keep BART operational which benefits the entire community (including Title VI/EJ communities) at large, and all communities will benefit proportionately from the increased service levels made possible by the project.

Per the FTA Title VI/EJ Circulars, proposed projects should look at the likely adverse effects and benefits, select alternatives, and incorporate measures to address impacts as needed. Due to operational and engineering specifications that prescribe the location of TPSS in a manner that can connect to the BART mainline, there are no feasible alternatives for modifying the locations of TPSS out of a specific community. While there are no alternatives, TPSS facilities do benefit all communities including minority and low-income, and with implementation of the recommended measures, all adverse effects to Title VI/EJ populations have been reduced or minimized to less-than-significant levels.

M. USE OF PUBLIC PARKLAND AND RECREATION AREAS

The Negative Declaration [**Appendix A**] and addenda [**Appendix B** and **Appendix C**] for HMC assessed the potential impacts on public parkland and recreation areas. No impacts are anticipated.

The table below lists the closest parks to the five new substations based on geographic information system and city databases.

Table 10: List of the Closest Parkland or Recreational Area

	Closest parkland or recreational area? (feet)	Name of the Closest Park
Civic Center Station	440	United Nations Plaza
Montgomery Station	350	McKesson Plaza
Oakland 34th Street & I-980	85	Grove Shafter Park
Concord – Minert Road	425	Oak Grove Middle School Playground
Richmond	1075	Lucas Park

The program will not use land from or otherwise affect parks or a recreation areas. Access to parks will be improved in general by more frequent peak hour service. There is no Section 4(f) use or temporary occupancy of public recreation areas.

N. IMPACTS ON WETLANDS

The Negative Declaration [**Appendix A**] and addenda [**Appendix B** and **Appendix C]** for HMC assessed potential impacts on wetlands. The project as defined would not have adverse effects on wetlands.

There are no wetlands in the vicinity of the traction power substation locations. The project would not involve any activities that will discharge dredged or fill material into waters and wetlands. No Section 404 Permit would be required. No adverse effects on wetlands are anticipated.

O. FLOODPLAIN IMPACTS

The Negative Declaration **[Appendix A**] and addenda [**Appendix B** and **Appendix C**] for HMC assessed potential impacts on floodplains. The project as defined would not have adverse effects on floodplains.

For the City and County of San Francisco, the GIS data are not available but the Federal Emergency Management Agency's (FEMA) issued a preliminary flood map. The Downtown San Francisco Civic Center and Montgomery Substations are not located in the 100-years flood plain area designated on the City's interim floodplain map. The project would not place structures in the 100-year flood hazard area that would impede or redirect flood flows[14]. Per FEMA's Flood Insurance Rate Maps, the Concord David Avenue and Minert Road substation is located approximately 75 feet from the 100-year flood plain. **Appendix P** shows the location of the floodplains in relation to proposed TPSS sites. There is no floodplain area in the vicinity of the Richmond RYE Gap breaker substation.

No effects on the flood zone or to the floodplain elevation are anticipated.

P. IMPACTS ON WATER QUALITY, NAVIGABLE WATERWAYS, & COASTAL ZONES

The San Francisco Bay is approximatively 2.5 miles from HMC Phase 2 and half a mile from the closest substation (Downtown San Francisco Montgomery Station). The Negative Declaration [**Appendix A**] for HMC assessed that the project as defined would not have adverse effects. The Downtown San Francisco Montgomery Station TPSS is underground and no effects on the bay are

[14] City and County of San Francisco *San Francisco Floodplain Management Program* Available online: *http://sfgsa.org/san-francisco-floodplain-management-program* [accessed on October 5th, 2016]

anticipated. Except the bay, there are no other water bodies within a half mile radius of HMC or any substation sites.

Construction and areas of soil disturbance may be considered activities that may affect water quality. In case larger excavations are required, the project would avoid releases or discharges into waterways and the storm drain system. Storm water best management practices (as discussed in the Section S *Impacts Caused by Construction* on **page 47**) will be employed during construction as needed.

There would be no construction or operation of facilities that would result in any discharge into navigable waters since construction would not be along navigable waterways. Therefore, no Clean Water Act, Section 401 Certification would be required for the proposed project. No adverse effect on water quality, navigable waterways and coastal zones are anticipated.

Q. IMPACTS ON ECOLOGICALLY-SENSITIVE AREAS AND ENDANGERED SPECIES

The Negative Declaration [**Appendix A**] and addenda for HMC [**Appendix B** and **Appendix C**] assessed potential impacts on biological resources, including habitat, and concluded that the facility would have less than significant impacts.

The TPSS sites are located within the existing BART and Caltrans right-of-way, The two in San Francisco are located underground, while the three located in the East Bay are in transportation and industrial land use and not in or near any ecologically sensitive areas and endangered species, The Richmond and Concord sites feature gravel ballast trackway with sparse and intermittent vegetation, while the Oakland site is located under a freeway ramp structure. the project as defined would not have adverse effects on biological resources.

Endangered & Threatened Species

Information regarding the potential presence of species and critical habitats listed or proposed for listing under the ESA, was obtained from the following sources:

- US Fish and Wildlife Service
- California Natural Diversity Database (CNDDB) of the California Department of Fish and Wildlife.

According to the California Natural Diversity Database (CNDDB)[15] of the California Department of Fish and Wildlife, the following endangered or threatened species have their habitat in the region where the substations will be located.

[15] California Natural Diversity Database, GIS Data

Table 11: List of Endangered or Threatened Species in the Vicinity of the New TPSS Sites

Species	Location	Radius[a]	Status	Effects?	Explanation
Longfin Smelt (fish)	San Francisco	1/2 mile	Federal Listed Candidate, State Listed Threatened	None	No works in waterways
California Black Rail (bird)	San Francisco	1/2 mile	State Listed Threatened	None	Underground work
Beach Layia (plant)	San Francisco	500 feet	Federal and State Listed Endangered	None	No works executed on beaches
Alameda Whipsnake (snake)	Richmond & Concord	500 feet	Federal and State listed Threatened	None	Poor quality habitat

Maps of the CNDDB with the location of these species habitat are provided in **Appendix P.**

The Longfin Smelt (*Spirinchus thaleichthys*) is a fish. Construction and operation would avoid discharges into waterways and thus, no effects are anticipated.

The California Black Rail (*Laterallus jamaicensis coturniculus*) is a bird. Since work in the San Francisco area will be underground, there would be no effect.

The Beach Layia (*Layia carnosa*) is a plant occuring in beach area in San Francisco. Since no work will take place on beaches and all work will be underground or on existing sidewalks, no effects are anticipated.

Alameda Whipsnake (*Masticophis lateralis euryxanthus*) may occur in grasslands and open woodlands. The Richmond and Concord TPSS site are railroad right-of-way consisting of gravel ballast trackway, with intermittent sparse vegetation. Since the sites are not grasslands or open woodlands, no effects are anticipated.

Under Section 7, Federal agencies must consult with the U.S. Fish and Wildlife Service (Service) when any agency action may potentially affect a listed endangered or threatened species. Since no effects on endangered or threatened species are anticipated, no Section 7 consultation was deemed necessary. No permits from the Army Corps, the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service are required.

Mature Tree Removal

The Civic Center and Montgomery substations in San Francisco are located entirely underground and there are no trees in the existing facilities. There are no trees at the Richmond RYE Gap Breaker TPSS site. Therefore, no tree removal is planned on those sites and no trees would be affected.

Tree removal may occur for installation of the *Concord - David Avenue and Minert Road* TPSS and the *Oakland south of 34th Street in the I-980 right-of-way* TPSS. The number of trees to be removed will be determined later in the design phase. Any future removal would be performed outside the nesting season as part of the best practices. If tree removal is needed, the tree(s) would be replaced at a 1:1 ratio outside BART's operating envelope. Therefore, no adverse effects are anticipated.
No trees will be affected on the HMC Phase 2 site.

R. IMPACTS ON SAFETY AND SECURITY

General Safety

The project would comply with seismic safety standards per BART Facilities Standards. The general design policy of BART Facilities Standards Structural Criteria for Seismic Design incorporates the relevant seismic safety provisions of the California Building Code (CBC) and the California Department of Transportation Bridge Design Specifications (CBDS) along with other professional industry standards. BART Design Criteria require that all operating facilities be designed to withstand the effects of the Maximum Credible Earthquake without significant degradation of structural integrity.

The project would comply with security procedures per BART Facilities Standards, both during construction and operation. Work would be coordinated with BART Police and a security plan would be developed for the project. No effects on general safety and security are anticipated.

Downtown San Francisco Civic Center Substation

The construction of the Downtown San Francisco Civic Center substation requires the permanent closure of two passenger entrances/exits to the station. Six entrances/exits will still be in operation. The remaining entrances/exits will satisfy the requirements of NFPA 130[16] [**Appendix H**].

In the event of a failure, substation equipment may catch fire, introducing a safety risk at the concourse level. Ventilation will remove smoke from the underground station. A permanent fire rated barrier will be built as a part of the project. Therefore, no effects are anticipated.

Downtown San Francisco Montgomery Substation

The location of this substation is directly in the middle of Montgomery Station in BART's paid area, with a secondary location in the free area adjacent to an SFMTA stairway. The location is in an area with minimal foot traffic, within BART's paid area and next to MUNI's paid area. Redefining the perimeter and paid area barriers will be necessary and structural improvements may be necessary to support a new substation. Therefore, no effects are anticipated.

As with the Civic Center substation, in the event of a failure, substation equipment may catch fire introducing a safety risk at the concourse level. Ventilation will remove smoke from the station. A permanent fire rated barrier will be built as a part of the project. Therefore, no effects are anticipated.

Substation near public access

Substations would need to be fenced to prevent people from being in contact with electrical equipment. Substations in Richmond (RYE Gap Breaker Conversion), Concord (David Avenue and Minert Road) and Oakland (34th Street and I-980) will be fenced and signage will warn people of the danger, as with all current BART substations. Therefore, no effects are anticipated.

S. IMPACTS CAUSED BY CONSTRUCTION

The Final Negative Declaration [**Appendix A**] and addenda for HMC [**Appendix B** and **Appendix C**] assessed the impacts caused by construction and concluded that the project as defined would not have adverse effects during construction.

The potential construction impacts of the five new TPSS are discussed below.

[16] NFPA 130: Standard for Fixed Guideway Transit and Passenger Rail Systems, National Fire Protection Association, Edition 2014

Construction Schedule[17]

Construction of HMC Phase 2 would commence approximately in Winter 2019 and would be separated in two key elements: the storage yard and the flyover. The construction of the storage yard would take approximately 24 months. The storage yard would be constructed simultaneously with the flyover that is projected to be built in approximately 35 months.

Installation of the new TPSS is expected to begin in the Fall of 2019. The projected span of construction activities for a TPSS is 10 months for each location in downtown San Francisco. A period of eight months per substation is anticipated for the East Bay substations located in Oakland, Richmond and Concord.

Installation of CBTC would consist of installation of new racks, servers, computers, communication equipment and cable trays within the existing wayside train control rooms and central control facilities. The activities would also include trenching for new cabling, concrete pads for electronic equipment and radio antennas along the trackway. A majority of the activities would involve testing the new system and associated software engineering. All of these associated activities will take place within existing BART right-of-way and existing facilities. BART anticipates that the installation would be occur in eight phases, with each of the phases focusing on a specific part of the BART system. Phases would start in 2019 and end in 2028.

Traffic management plan

For the downtown San Francisco TPSS locations, temporary partial street closures could be needed for the delivery and installation of the equipment. Depending on the station, an existing skylight or the existing BART entrance may be used to deliver the equipment to the underground level. Temporary sidewalk closures may be necessary. For the delivery through a passenger station entrance, the entrances will need to be closed to the public during the construction. Delivery of the largest equipment is expected to require a street level crane setup, with work performed during off hours, and with active traffic management to avoid adverse impacts.

During construction and installation, there may be occasional impacts to BART service and MUNI service. Since new raceways and conduits will need to be routed to connect the new substation to the existing contact rail system at track level, this work will need to occur during BART and MUNI non-operational hours. Access and work protections from train movement and electrification will need to be implemented.

Adequate space must be maintained during construction on the sidewalk and street. Work will need to occur during non-peak hours to minimize any impacts to automobile and pedestrian traffic. Community outreach efforts are also recommended for addressing any potential concerns from affected local businesses[18].

Stormwater Pollution Prevention

BART will obtain coverage under a NPDES General Permit for stormwater, the BART District shall require the contractor to implement control measures consistent with the General Permit and recommendation and policies of the RWQCB – including submittal of a Notice of Intent with site map, developing a Storm Water Pollution Prevention Plan (SWPPP), and implementing BMPs

[17] Construction schedule is at a preliminary stage and could change

[18] PGH Wong, *Draft Core Capacity Traction Power Equipment Constructability Review Downtown San Francisco, May 8, 2016* **[Appendix F]**

Air Quality

The major emission sources during construction are emissions from diesel-fueled construction equipment, dust generated by mechanical disturbance, and windblown dust from exposed soil. The proposed project would generate a limited amount of dust and other air pollutant emissions as construction will consist primarily of minor grading, the construction of concrete slabs, and the delivery and setting of equipment by use of a crane. The locations in Oakland, Richmond, and Concord have more potential for dust as the locations may have some exposed soil. The construction area for the San Francisco locations will be made up of street and sidewalks.

The Bay Area Air Quality Management District (BAAQMD) provides some screening criteria in their Air Quality Guidelines (May 2010). These criteria are to help determine whether a proposed project would result in potentially significant air quality impacts. The screening level for general light industry is 259,000 square feet. It is estimated that construction would occur over approximately 45,000 square feet (total for all 5 locations), well below the construction-related screening sizes used in the Air Quality Guidelines.

The BAAQMD recommends the implementation of the measures listed below irrespective of any potential of construction-related emissions exceeding applicable thresholds of significance. Project specifications will incorporate these measures as applicable and the construction contractor will be required to implement them. The construction manager will oversee and monitor the contractor's compliance with construction measures, rules, and regulations.

Basic Construction Measures Recommended for All Proposed Projects[19]

- All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
- All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
- All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
- All vehicle speeds on unpaved roads shall be limited to 15 mph.
- All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.
- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.
- All construction equipment shall be maintained and properly tuned in accordance with manufacturer’s specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.
- Post a publicly visible sign with the telephone number and person to contact at the Lead Agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The BAAQMD’s phone number shall also be visible to ensure compliance with applicable regulations.

Construction greenhouse gas (GHG) emissions include emissions produced by onsite construction equipment and emissions arising from traffic delays due to construction. These emissions will be produced at different levels throughout the construction phase. The measures listed above will also help reduce construction equipment GHG emissions. The frequency and occurrence of traffic related GHG emissions can be reduced by implementing better traffic management during construction phases.

[19] *BAAQMD, Air Quality Guidelines, 2010*

BART will implement the BAAQMD recommended measures as listed above. No impacts are anticipated.

Noise and Vibration

Temporarily elevated noise and vibration levels could result from construction activities associated with re-working and constructing new TPSS[20]. These activities may include demolition, grading, minor excavation, foundation fabrication, paving and installation of system components. The increased levels may occur in residential areas and at other noise-sensitive land uses located within 200 feet of the construction activity. No very high noise and vibration producing activity such as pile driving is anticipated to be necessary for elements of this program. Construction at each TPSS location will be for a limited amount of time. While construction noise and perhaps vibration levels will be briefly elevated, they will not be substantial and will not create impacts if best management practices are followed.

The following good practice measures will be applied by contract specifications to construction as appropriate to minimize temporary construction noise and vibration:

- All equipment powered by internal combustion engines shall be equipped with effective mufflers and silencers in good repair.
- All compressed air and hydraulically driven equipment shall be equipped with the manufacturer's "quiet package" if available.
- Avoid nighttime construction affecting residential neighborhoods.
- Locate stationary construction equipment as far as possible from noise-sensitive use.
- Construct temporary noise barriers, such as temporary walls or noise curtains between noise-sensitive receivers and any very noisy activities requiring an extended duration.
- Route construction-related truck traffic to roadways that will cause the least disturbance to nearby residents.
- Use alternative construction methods if necessary to minimize the use of impact and high vibration equipment (e.g., vibratory compactors) near sensitive land use.

BART will implement the best practices measures listed above. No impacts are anticipated.

Construction Management Best Practice

Best construction and management practices would be evaluated during the final design phase and could include but not limit to:

- Construction Phasing and Traffic Management Plan
- Construction Phasing to Reduce Air Emissions
- Dust Control during Construction
- Construction-Related Greenhouse Gas Best Management Practices
- Identify construction activities that, due to concerns regarding traffic safety or congestion, must take place during off-peak hours
- Conduct a Health and Safety Risk Assessment prior to any construction activity
- Develop a site-specific Health and Safety Plan

BART will implement the best practices measures listed above. No impacts are anticipated.

[20] *Noise and Vibration Technical Report* [**Appendix I**], October 2016, p 37.

T. SUPPORTING TECHNICAL STUDIES OR MEMORANDA

On November 17, 2016, the BART Board adopted the Transbay Corridor Core Capacity Project with a finding that the 306 additional vehicles, communications based train control, and five new traction power substations are statutorily exempt from the California Environmental Quality Act (CEQA) in accordance with the Public Resources Code, Section 21080(b)(10) [**Appendix J**].

U. PUBLIC OUTREACH AND AGENCY COORDINATION

BART has coordinated with Caltrans regarding the TPSS proposed for installation in the I-980 right-of-way south of 34th Street in Oakland. Caltrans staff did not identify any issues, and the process for securing a cooperative agreement has been initiated.

BART is coordinating with the City and County of San Francisco relative to the closure of the Civic Center station entrances and the number, location, size, and design of the TPSS vent grates along Market Street. The letter [**Appendix G]Error! Reference source not found.** documents the City's support for the project.

BART has coordinated with the MTC's Air Quality Conformity Task Force on the analysis process for an air quality conformity finding for the acquisition of additional vehicles.

The new BART vehicles, traction power enhancements, and the CBTC system are described on the BART website at: https://www.bart.gov/about/projects and https://www.bart.gov/sites/default/files/better-bart/BetterBART_Brochure_0.pdf

The action described above meets the criteria for a NEPA categorical exclusion (CE) in accordance with 23 CFR Part 771.118 (subsections (c)(1) (power substations and other discrete utilities within or adjacent to existing right of way), (c)(5) (installation and improvement of safety and communication equipment within or adjacent to existing right of way), (c)(7)(acquisition of rail cars that can be accommodated by existing facilities or by new facilities that qualify for categorical exclusion) and (c)(12) (projects within existing operational right of way including transit power substations and transit venting structures).

Oct. 12, 2017

Applicant's Environmental Reviewer **Date**

REFERENCE

The list of CEs in 23 CFR 771.118 focuses on actions most applicable to FTA. It is FTA's responsibility to determine whether the action described by the grant applicant ("applicant") falls within the CE category (i.e., the action meets all conditions listed in the CE), whether the action is inappropriately segmented from a larger project, and whether there are unusual circumstances that would make a CE determination inappropriate).

Grant applicants should include sufficient information for FTA to make a CE determination. A description of the project in the grant application, as well as any maps or figures typically included with the application or as requested by the FTA Regional Office, should be submitted to FTA to determine whether the CE applies.

Given the nature of the CEs listed under section 771.118(c), documentation demonstrating compliance with environmental requirements other than NEPA, such as Section 106 of the National Historic Preservation Act ("Section 106"), or Section 7 of the Endangered Species Act, may be necessary for the processing of the grant. That supporting documentation can be included in TEAM (preferred) or kept in the FTA Regional Office's project files. Other applicable environmental requirements must be met regardless of the

applicability of the CE under NEPA, but compliance with other environmental requirements does not elevate an action that otherwise is categorically excluded under section 771.118(c) to section 771.118(d).

Pursuant to 40 C.F.R. § 1506.5, applicants or applicants' contractors may prepare NEPA documents for submittal to federal agencies. However, the applicant is responsible for submitting accurate and complete documentation to FTA. The applicant should prepare a separate transmittal letter or statement to accompany the CE verifying that they have reviewed the information contained in the document when they transmit it to FTA. The transmittal should include the following statement:

> *"in submitting the Transbay Corridor Core Capacity Program categorical exclusion (CE) to the FTA, the applicant, the Bay Area Rapid Transit, affirms that it has reviewed and supports the information presented documenting the proposed action as meeting the criteria for a CE in accordance with 23 CFR Part 771.118 (d). Following independent review and verification by FTA, applicant requests that it be notified of the acceptability of its submission"*

INFORMATION REQUIRED FOR PROBABLE CATEGORICAL EXCLUSION
(Per 23 C.F.R. Part 771.118)

For the
Transbay Corridor Core Capacity Program
BAY AREA RAPID TRANSIT (BART)

Revision Record	
Issue No.	**Date**
Draft 1	January 2017
Draft 2	May 2017
Draft 3	June 2017
Draft 4	August 2017
Final	October 2017

U.S. Department
of Transportation

**Federal Transit
Administration**

REGION IX
Arizona, California,
Hawaii, Nevada, Guam,
American Samoa,
Northern Mariana Islands

90 7th Street
Suite 15-300
San Francisco, CA 94103-6701
(415) 734-9490
(415) 734-9489 (fax)

SEP 14 2017

Ms. Grace Crunican, General Manager
San Francisco Bay Area Rapid Transit District
300 Lakeside Drive, P.O. Box 12688
Oakland, CA 94604-2688

Re: Categorical Exclusion Request for BART
Transbay Core Capacity Project

Dear Ms. Crunican, GRACE

The Federal Transit Administration (FTA) has completed its review of your letter received on September 5, 2017 for an environmental determination for the proposed San Francisco Bay Area Rapid Transit District (BART) Transbay Core Capacity project (Project). The project proposes a package of strategic investments that will increase BART capacity between San Francisco and Oakland. The project consists of four elements including the expansion of the rail car fleet by 306 cars, the expansion of the existing Hayward Maintenance Complex (HMC), the implementation of a communications-based train control system (CBTC), and the addition of five new traction power substations (TPSS).

Based on the information presented in your request letter and the supporting documentation you submitted, we concur in your determination that the Project described above meets the criteria for a NEPA categorical exclusion (CE) in accordance with 23 CFR Part 771.118 (subsections (c)(1) (power substations and other discrete utilities within or adjacent to existing right of way), (c)(5) (installation and improvement of safety and communication equipment within or adjacent to existing right of way), (c)(7)(acquisition of rail cars that can be accommodated by existing facilities or by new facilities that qualify for categorical exclusion) and (c)(12) (projects within existing operational right of way including transit power substations and transit venting structures).

This review, which is based on past experience with similar projects, finds that the Project: does not induce significant environmental impacts to planned growth or land use for the area; does not require the relocation of significant numbers of people; does not have a significant impact on natural, cultural, recreational, historical or other resource; does not involve significant air, noise, or water quality impacts; does not have significant impacts on travel patterns; and does not otherwise, either individually or cumulatively, have any significant environmental impact.

If you have any questions about this review, please contact Dominique Paukowits, FTA Region IX Community Planner, at (415) 734-9469 or dominique.paukowits@dot.gov.

Sincerely,

Leslie T. Rogers
Regional Administrator

INFORMATION REQUIRED FOR PROBABLE CATEGORICAL EXCLUSION (Per 23 C.F.R. Part 771.118)

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Acronyms

AC	Alternating Current
BAAQMD	Bay Area Air Quality Management District
BART	Bay Area Rapid Transit
BMP	Best Management Practices
CBTC	Communication-based Train Control
CE	Categorical Exclusion
CEQA	California Environmental Quality Act
CNDDB	California Natural Diversity Database
DC	Direct Current
EJ	Environmental Justice
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
GHG	Greenhouse Gases
HHS	Department of Health and Human Services
HMC	Hayward Maintenance Complex
LEP	Limited English Proficiency
MPO	Metropolitan Planning Organization
MTC	Metropolitan Transportation Agency
NAHC	Native American Heritage Commission
NEPA	National Environmental Policy Act
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
ROQ	Right-of-way
RTP	Regional Transportation Plan
RWQCB	Regional Water Quality Control Boards
SFMTA	San Francisco Municipal Transportation Agency
SHPO	State Historic Preservation Officer
SWRCB	State Water Resources Control Board
TIP	Transportation Improvement Program
TPSS	Traction Power Substations

INTRODUCTION

This Documented Categorical Exclusion (DCE) is intended to satisfy NEPA requirements for the Transbay Corridor Core Capacity Program. The DCE is divided into 21 sections or "Topic Areas" designated A through U, as shown in the Table of Contents on **page 2**. Topic Area A describes the Transbay Corridor Core Capacity Program, Topic Area B describes the location of each program element, and Topic Areas C through U discuss the program's anticipated impacts on the physical and human environment.

A. DETAILED PROJECT DESCRIPTION

The Bay Area Rapid Transit (BART) system currently consists of 112 route miles of heavy rail transit serving 46 stations in San Francisco, in the East Bay, and on the Peninsula (see **Figure 1**). An additional 10 route miles and 2 stations are currently under construction south of Warm Springs, and an additional 10 miles and 2 stations are being built in eastern Contra Costa County. The system operates as five lines designated by different colors - Yellow, Green, Red, Orange and Blue. Four of these lines - all but the Orange Line - merge into a single double-track alignment connecting San Francisco and Oakland, which operates through the Transbay Tube[1].

Figure 1: Existing BART System plus Extensions under Construction

On the main trunk of the BART system, from the Oakland wye through the Transbay Tube to Daly City, BART currently operates a maximum of 23 trains per hour in the peak direction. Train lengths vary, but currently average 8.9 cars per train in the peak. Between Oakland and San Francisco, peak hour trains are crowded and ridership is continuing to grow. As the system expands and the core of the system continues to attract development, further increases in ridership are expected.

[1] Bay Area Rapid Transit (BART), Available online: *https://www.bart.gov*

BART is proposing a package of strategic investments that will increase capacity between San Francisco and Oakland by more than 30 percent. During peak hour (weekdays from 8 to 9 am and 5:30 to 6:30 pm), the number of trains operating through the tube will be increased from 23 per hour to 30 in each direction, and train lengths will be increased from an average of 8.9 to 10 cars per train. The Transbay Corridor Core Capacity Program will allow BART to operate up to 30 ten-car trains per hour through the Transbay Tube, maximizing passenger throughput in the most heavily used part of the system. The program includes four elements:

1. Expansion of the rail car fleet by 306 new cars;
2. Phase 2 of the Hayward Maintenance Complex (HMC) to add additional storage for the expanded rail car fleet;
3. Communication-based train control (CBTC) system;
4. Five additional traction power substations (TPSS).

Each of these elements is further described starting on **page 8**.

CEQA Process and Prior NEPA Documentation

The California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) processes for Phases 1 and 2 of the HMC were already well advanced when the CEQA and NEPA processes were undertaken for the rest of the Transbay Corridor Core Capacity Program:

- May 26, 2011: the BART Board adopted the Final Negative Declaration for HMC under CEQA.
- September 21, 2011: the Federal Transit Administration (FTA) approved a Categorical Exclusion (CE) for HMC under NEPA. The CE indicated no adverse impacts.
- May 9, 2013: the BART Board adopted an Addendum to the CEQA Negative Declaration to cover demolishing Building 3 and replacing it with a new building for the component repair shop. This change is in HMC Phase 1 and does not affect Phase 2.

The FTA's 2011 Categorical Exclusion for HMC covered both Phase I (maintenance facility) and Phase 2 (storage facility). At the time, BART was experiencing a short term need for added maintenance capacity but was unsure of the need for additional storage at HMC. The future need for additional storage capacity was viewed in the context of planning for other major expansion projects. BART elected to proceed with HMC Phase 1 as a separate project with independent utility from HMC Phase 2. Once planning for the Transbay Corridor Core Capacity Program was initiated, the need for additional cars and storage became more apparent, and prior work on HMC Phase 2 was revived.

The BART Board adopted a second addendum to the HMC Negative Declaration in August 2016. That addendum summarizes the changes made to the HMC project since 2011. Only one of the changes – a sound wall discussed in Section H *Noise* (**page 37**) – is within the footprint of HMC Phase 2. Otherwise, neither Phase 2 of HMC nor the environment affected by Phase 2 has changed since 2011, and no additional impacts are anticipated. The Negative Declaration and the CE for HMC plus the two addenda are incorporated into this document by reference and are provided as appendices.

On November 17, 2016, the BART Board adopted the Transbay Corridor Core Capacity Program with a finding that the 306 added vehicles, communications based train control, and five additional traction power substations are statutorily exempt from the CEQA in accordance with the Public Resources Code, Section 21080(b)(10). This BART Board action completes the CEQA process for these three elements. The CEQA process for HMC was completed by the Negative Declaration and the addenda to the Negative Declaration cited above.

Expansion of the rail car fleet by 306 new cars

BART's existing fleet of 669 rail cars is at the end of its useful life and is being replaced. BART is starting to receive deliveries on an order of 775 vehicles, including 669 replacement vehicles and 106 vehicles for extensions and capacity expansion[2].

In a second phase of vehicle procurement, the subject of this categorical exclusion, BART intends to acquire an additional 306 new rail cars, bringing the total fleet to 1,081 vehicles.

Of the 306 additional cars to be acquired in the second phase, 252 are needed for BART to expand capacity in the Transbay Corridor and to operate 30 ten-car trains per hour on the four lines that operate through the Transbay Tube (Red, Blue, Green and Yellow). The remaining 54 are to increase capacity on the Orange line (which does not operate through the Transbay tube) and to provide additional cars for the ready reserve fleet.

Phase 2 of the Hayward Maintenance Complex

The current storage capacity across all of BART's yards and tail tracks is 893 vehicles. BART currently has 669 cars in the fleet, and BART has 775 new cars on order to replace the existing fleet. Once the new fleet of 775 cars is delivered, BART will still have capacity for 893 cars, meaning that space for approximately 118 additional cars will exist on the system, though all unused spaces cannot always be used effectively, due to the need to have spare spaces to marshal trains in the yards. To accommodate the additional 306 new vehicles that BART will acquire as part of the Transbay Corridor Core Capacity Program, and to maintain functional yards with room to properly marshal trains, BART will construct HMC Phase 2 to provide storage for 25 ten-car trains, or 250 additional rail vehicles. This will give BART a future total fleet of 1081 cars and a system storage capacity of 1143 cars across all the yards. BART will have marshalling capacity of approximately 62 spaces, divided between 4 yards, or about 15 spaces per yard. This space is needed to keep the yards functional.

The yard will be constructed with access to the existing yard and electrified such that it may serve as a fully operational vehicle storage facility. The HMC offers the only practical site to expand storage on the BART system to accommodate the additional cars that are part of the Transbay Core Capacity Program. HMC Phase 2 provides for additional storage capacity only. Added maintenance capacity will be provided by the HMC Phase 1 project, which is separately funded and outside the scope of the Transbay Corridor Core Capacity Program.

Communication-based Train Control (CBTC) System

To achieve the shorter headways needed to operate 30 regularly scheduled trains per hour through the Transbay Tube, BART will replace its existing train control system with a new CBTC system.

The new CBTC system will be based on a moving-block signaling approach throughout the existing system plus the extension now under construction between Warm Springs and Berryessa. The new CBTC system will consist largely of lineside equipment installed within BART's existing right-of-way throughout the entire system. Existing signaling equipment will be overlaid with the most current electronics, software, computer systems, and cabling. New zone controllers, radio antennas, interlocking controllers and wayside radio transponder tags will be installed throughout the trackside alignment, train control rooms and central control facilities. Cars and maintenance vehicles will be outfitted with processor based controllers, transponders, communication equipment and location sensors.

[2] Bay Area Rapid Transit (BART) *New Train Car Project* http://www.bart.gov/about/projects/cars/why-new-cars [Accessed on August 17th 2016]

Installation activities will include trenching for new cabling, concrete pads for electronic equipment and radio antennas along the trackway as well as new racks, servers, computers, communication equipment and cable trays within the wayside train control rooms and central control facilities. These activities will take place within existing BART right-of-way.

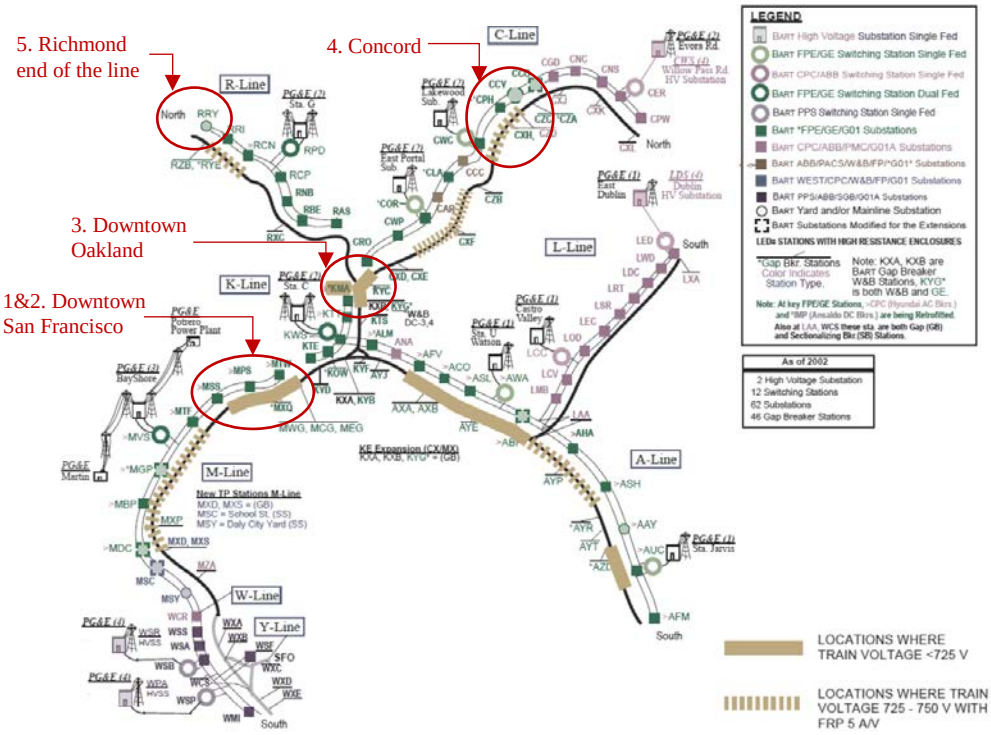
New Traction Power Substations (TPSS)

The increased train lengths and more frequent peak period trains will require additional traction power during operation. BART has conducted simulations to assess the power requirements associated with operating 30 regularly scheduled ten-car trains through the Transbay Tube per hour. The simulations assumed 30 trains per hour, and included various delay scenarios that would lead to bunched trains, providing a safety factor or contingency in the analysis. It also assumed the electrical profile of BART's new vehicles as well as the CBTC system necessary to operate trains this frequently. The simulations revealed specific areas along BART's mainline where the traction power requirements for the increased service exceed the capacity available from BART's existing traction power system[3].

Five sites have been identified for new substations and are shown in the **Figure 2**

1. Civic Center Station in San Francisco
2. Montgomery Station in San Francisco
3. Oakland near I-980 and 34th Street
4. Concord - David Avenue and Minert Road
5. Richmond - RYE Gap Breaker Conversion (Richmond Yard)

Figure 2: The BART Traction Power Subtransmission Network and Low Voltage Areas



[3] PGH Wong Engineering Inc., *BART Transbay Corridor Core Capacity Traction Power Simulation*, October 2016 **[Appendix E]**

Placement of a new TPSS in proximity to each area of low voltage will allow BART to operate the 30 train per hour service optimally. Locating a new TPSS close to an existing TPSS site would only introduce redundant traction power capacity in that area and not enhance the existing system overall. Accessibility for operations and maintenance is another consideration when siting a new TPSS.

Further details on the siting of the five new TPSS are provided in Topic B, *Location*, starting on **page 11**.

Description of a TPSS

The typical TPSS site must accommodate several equipment areas, each one with certain required spatial clearances. Spacing considerations must include an Alternating Current (AC) house, Direct Current (DC) house, and space for two rectifier-transformers. These items of equipment can be configured in different ways so that the TPSS footprint can be accommodated within each site.

Figure 3: Typical TPSS Layout 1

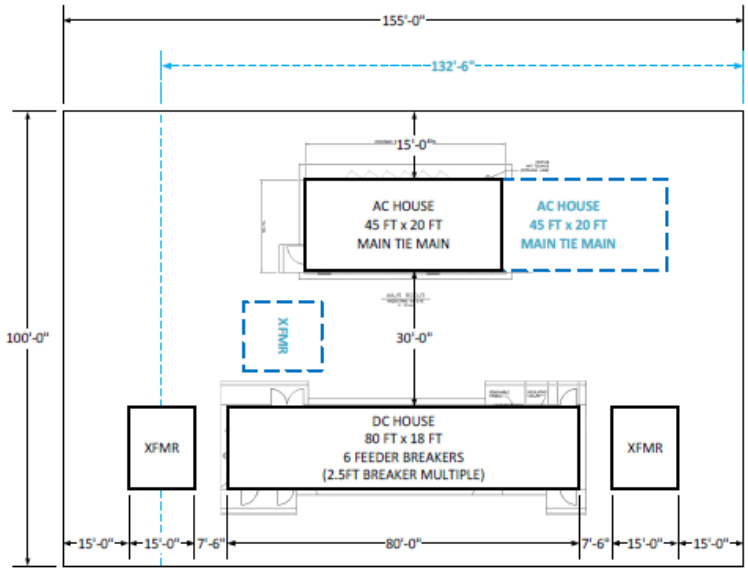
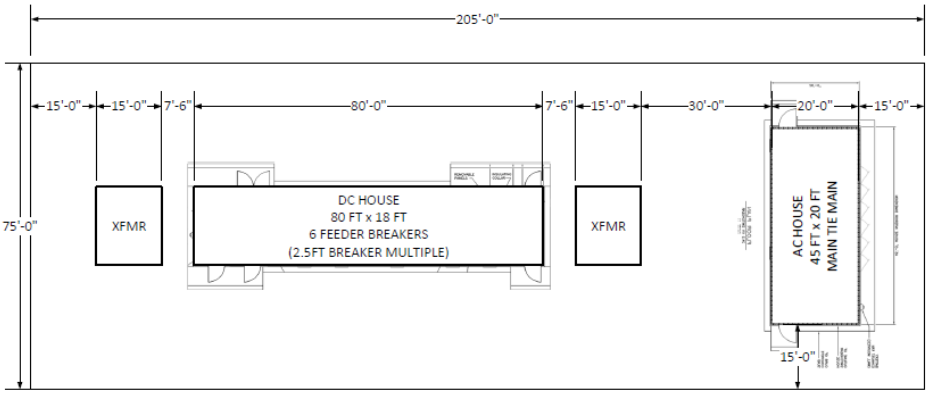


Figure 4: Typical TPSS Layout 2



Ventilation

The TPSS sites in San Francisco will be located under Market Street, within the existing BART stations at Montgomery and Civic Center. Underground TPSS facilities require a ventilation system. This system will be vented to the street level through a ventilation plenum, which can terminate at an at-grade vent grate in the sidewalk right-of-way. BART has identified several options for ventilating the two new TPSS under Market Street, and is coordinating with the City of San Francisco on the locations and design of these vents, which will be finalized during the design phase. The vents will be constructed pursuant to the California Building Code Chapter 4, Section 433, *Fixed Guideway Transit System* requirements and the National Fire Protection Association (NFPA) 130 Standard for Fixed Guideway Transit and Passenger Rail Systems, Edition 2014 requirements.

Constructability

BART has performed a constructability analysis[4] for the new TPSS to be located in downtown San Francisco. Consideration was given to spatial constraints and weight of the equipment as well as the impact on stakeholders during construction and installation. Installation activities for each new substation site in Downtown San Francisco will include:

- Providing temporary barrier
- Providing protection for other equipment.
- Providing civil and structural improvements.
- Installation of raceways and conduits through SFMTA and BART levels of the stations.
- Modification of entry points (passenger or skylight) for TPSS equipment delivery.
- Delivery and installation of TPSS equipment.
- Building permanent fire rated barrier.
- Restoration of facilities to their former state.

The constructability analysis confirmed that the TPSS could be installed within the Montgomery and Civic Center stations. At Montgomery, one station entrance would be temporarily closed, an escalator and stairway would be removed to provide a space for dropping the equipment down to the concourse level, and then the escalator and stairway would be replaced. At Civic Center, the current western access points located in front of Burger King (north-west corner of the intersection of Market and 8th Street) and in front of Chase Bank (south-west corner of the same intersection) would be permanently closed, to enable construction activities; and also to serve as the locations for placement of the emergency ventilation system and ventilation grates. Stairs and escalators at these two entrances will be removed, the TPSS equipment would be dropped to the concourse level through the opening, and then the opening would be decked over to create additional sidewalk space for pedestrians. Street lane closures may be required at both locations as the equipment is delivered to the site by truck, but will be limited in duration and occur during night time hours to minimize traffic impacts. The eastern entrances at the intersection of Market and 8th Street, the entrance at United Nation Plaza and the entrances at the intersection of Market and 7th Street would remain available for passenger use.

B. LOCATION

The new fleet will operate and the CBTC system will be installed within existing BART-owned right-of-way throughout BART's 112-mile system in five counties: San Francisco, Alameda, Contra Costa, San Mateo and Santa Clara. The physical features to be constructed as part of the Transbay Corridor Core Capacity Program – the features with a potential for environmental impacts – are HMC Phase 2 and the five traction power substations. The location of these features is further described below.

[4] PGH Wong, *Core Capacity Traction Power Equipment Constructability Review Downtown San Francisco, Revision B, November 7th, 2016* **[Appendix F]**

HMC Phase 2 Location Description

The Hayward Maintenance Complex (HMC) is located in the City of Hayward in Alameda County, California. It is being constructed within an industrial area on BART-owned property adjacent to the existing Hayward Yard, BART's existing operating tracks, and existing railroad tracks owned by the Union Pacific Railroad (UPRR). HMC Phase 2, the portion of HMC covered by this Categorical Exclusion, is bounded by Parkway West to the north, Whipple Road to the south, BART's existing operating tracks to the west, and the UPRR tracks and Carroll Avenue to the east. Residential development exists on the opposite side of the UPRR tracks and Carroll Road. Figure 1 in the Second Addendum to the Final Initial Study/Mitigated Negative Declaration [**Appendix C]** illustrates the location.

TPSS Location Description

The five new TPSS to be installed as part of the program would be in three counties – San Francisco, Alameda and Contra Costa. They are identified in **Table 1** and further described below.

Figure 5**, p.13,** shows the general location of the substations throughout the BART network. Site maps are provided in **Figures 6 to 15, pages 14 to 22**.

Table 1: Location of the Five New TPSS

Substation	City	Address	Description
Downtown San Francisco - Civic Center Station	San Francisco	1231 Market Street, San Francisco, CA 94103	The site is located underground on the concourse level at the western end of the station. It would involve closing the two western entrances permanently to Civic Center Station.
Downtown San Francisco- Montgomery Station	San Francisco	544 Market Street, San Francisco, CA, 94104	The location of the substation is planned to be in BART's paid area on the concourse level.
Oakland – south of 34th Street in I-980 right-of-way	Oakland	Next to 626, 33rd Street, Oakland, CA, 94609	Under highway ramp from EB I-580 to SB I-980 on Caltrans freeway right-of-way.
Concord - David Avenue and Minert Road	Concord	In front of 2050 Minert Road, Concord, CA, 94518	The site is on BART right-of-way next to the BART track, across Minert Road from a school and near a residential area.
Richmond - RYE Gap Breaker Conversion	Richmond	646 Portola Avenue, Richmond, CA, 94801	The site is on BART right-of-way next to a BART railyard, adjacent to an active UPRR and Amtrak right-of-way, and across Portola Avenue from a residential area. The TPSS would replace an existing gap breaker station.

Figure 5: General Location of the Five New TPSS

Downtown San Francisco - Civic Center Station

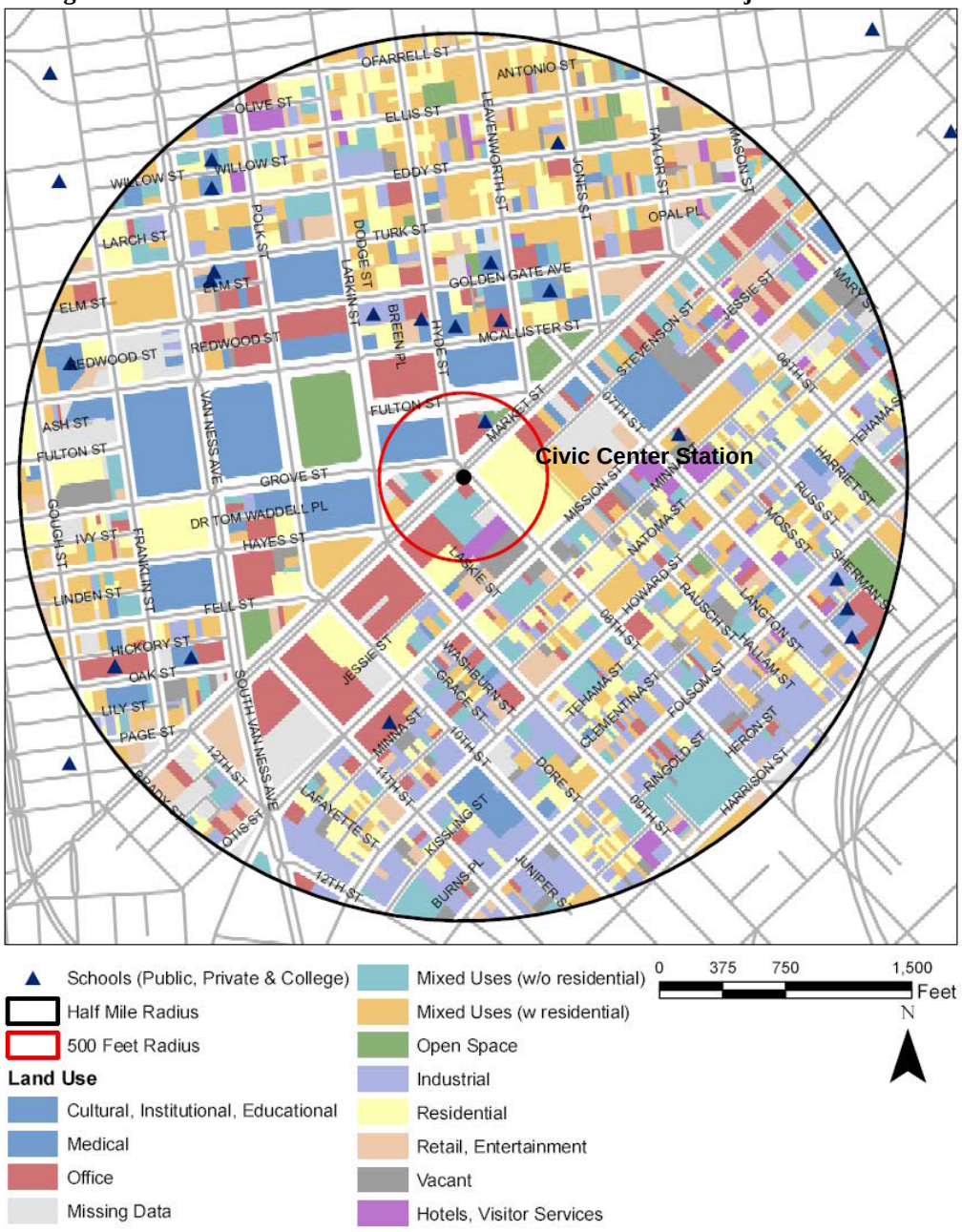
The proposed site for the *Civic Center* Station TPSS is underground on the concourse level of the station under Market Street, located near the intersection of Grove Street, Hyde Street and 8th Street. The proposed site would occupy the south-western end of the existing Civic Center Station.

The TPSS at Civic Center Station will be placed in the passageway connecting the concourse to the two station entrances located south and west of the station along Market Street as shown in **Figure 6, p.14.** This will necessitate the permanent closure of these entrances. John Rahaim, City and County of San Francisco Planning Department, sent BART a March 20, 2017, letter expressing support for BART's Core Capacity Program and acknowledging BART's intent to close the two westernmost entrances to the Civic Center Station and install a new TPSS in the corridor connecting the main part of the station to these entrances [**Appendix G**]. Six access portals would still be available for the riders at the eastern corner of the intersection of Market and 8th Street (2 access portals), the entrance at United Nation Plaza (2 access portals) and the entrances at the intersection of Market and 7th Street (2 access portals). The closure of these two portals has been analyzed for impact on emergency evacuation times and was found to have no impact [**Appendix H**].

Figure 6: Location of TPSS in Civic Center Station and Entrances to be Closed

The *Civic Center Station* site is located underground within the existing Civic Center Station near several public buildings including the San Francisco Public Library, the San Francisco City Hall and the Asian Art Museum. Parks in the vicinity of the proposed TPSS are the Civic Center Plaza and the United Nation Plaza. These elements are located north of Market Street. New residential buildings are under construction at the corner of 8th Street and Market Street. The TPSS will be located completely within existing transportation right-of-way underground within the Civic Center Station and will be consistent with the existing transportation land use. Consistency with land use and zoning is discussed in Topic D, *Land Use and Zoning*, starting on **page 24.**

Figure 7: Downtown San Francisco - Civic Center Substation Adjacent Land Use



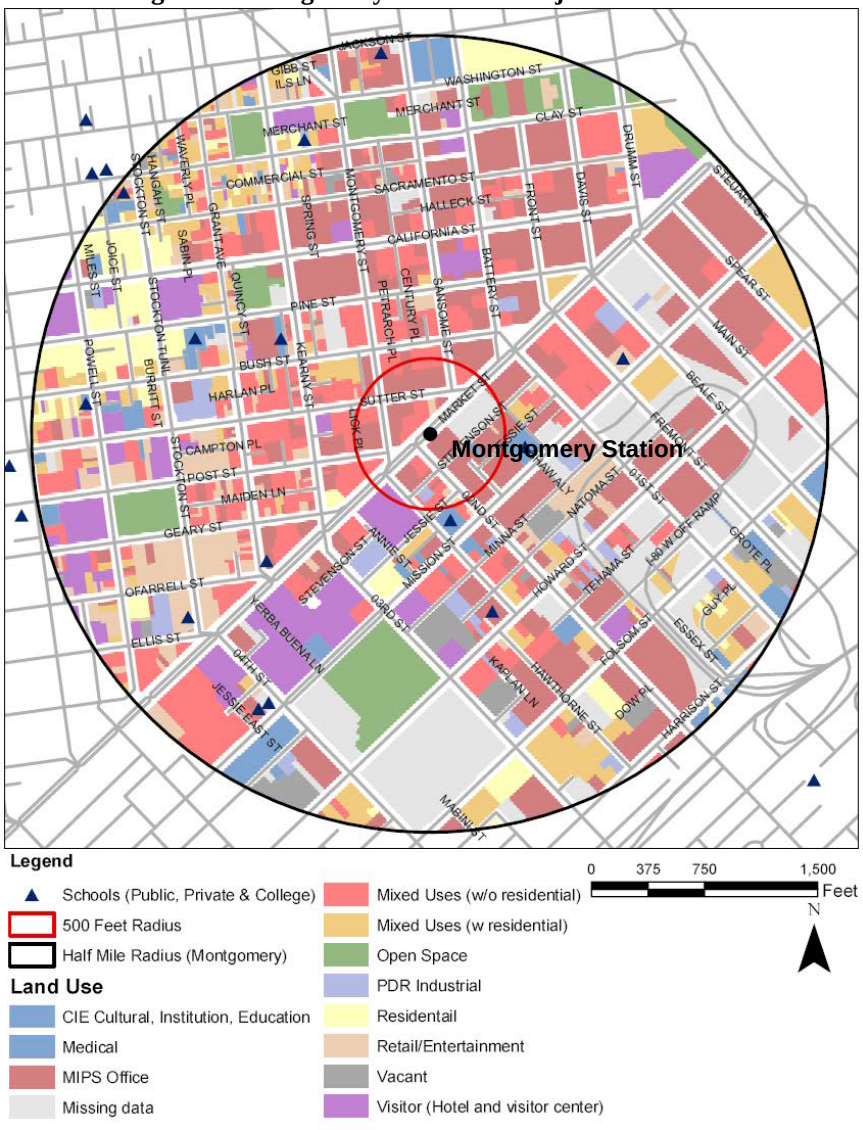
Downtown San Francisco - Montgomery Station

The location of the substation is planned to be underground on the concourse level in BART's paid area in Montgomery BART station in Downtown San Francisco. An alternative site is in the free area next to a MUNI stairway. Neither the underground concourse nor the area next to Muni stairway will involve permanent closure of any entrances to the Montgomery station.

The proposed site is located in the Financial District and the adjacent land uses are mainly offices. The TPSS will be located entirely underground, within existing transportation right-of-way within the Montgomery Station and will be consistent with the existing transportation land use. Consistency with land use and zoning is discussed in Topic D, *Land Use and Zoning*, starting on **page 24**.

Figure 8: Location of TPSS in Montgomery Station

Figure 9: Montgomery Substation Adjacent Land Use



Oakland –34th Street and I-980

The proposed substation would be located south of 34th Street in Caltrans-owned I-980 right-of-way, under the freeway off-ramp from eastbound I-580 to southbound I-980, as shown in Figure 10. The southbound I-980 lanes are immediately east of the site, and the BART trackway is in the center of the I-980 right-of-way. The proposed TPSS site is currently fenced in and accessible only by Caltrans maintenance crews, with no public access. The surrounding area is dominated by the freeway and ramp structures. The TPSS site is set among numerous large concrete freeway support columns for the freeway ramp structure overhead. Access to the TPSS site would be provided by the existing access road on the Caltrans right-of-way. Caltrans is supportive of this action based on initial conversations between BART and Caltrans, and a review of the proposal at a site meeting with Caltrans on August 15, 2016.

Several residential properties are located to the west of the proposed TPSS site. The residential properties are separated from the site by fences, trees, and the freeway support columns, which create an existing buffer between the TPSS site and the residential uses. A park is located on Caltrans property on the north side of 34th Street underneath the overhead freeway ramp structure north of 34th Street. The TPSS will be located completely within existing transportation right-of-way and will be consistent with the existing transportation land use for the parcel. Consistency with land use and zoning is further discussed in Topic D, *Land Use and Zoning*, starting **on page 24**.

Figure 10: Footprint of the Oakland TPSS

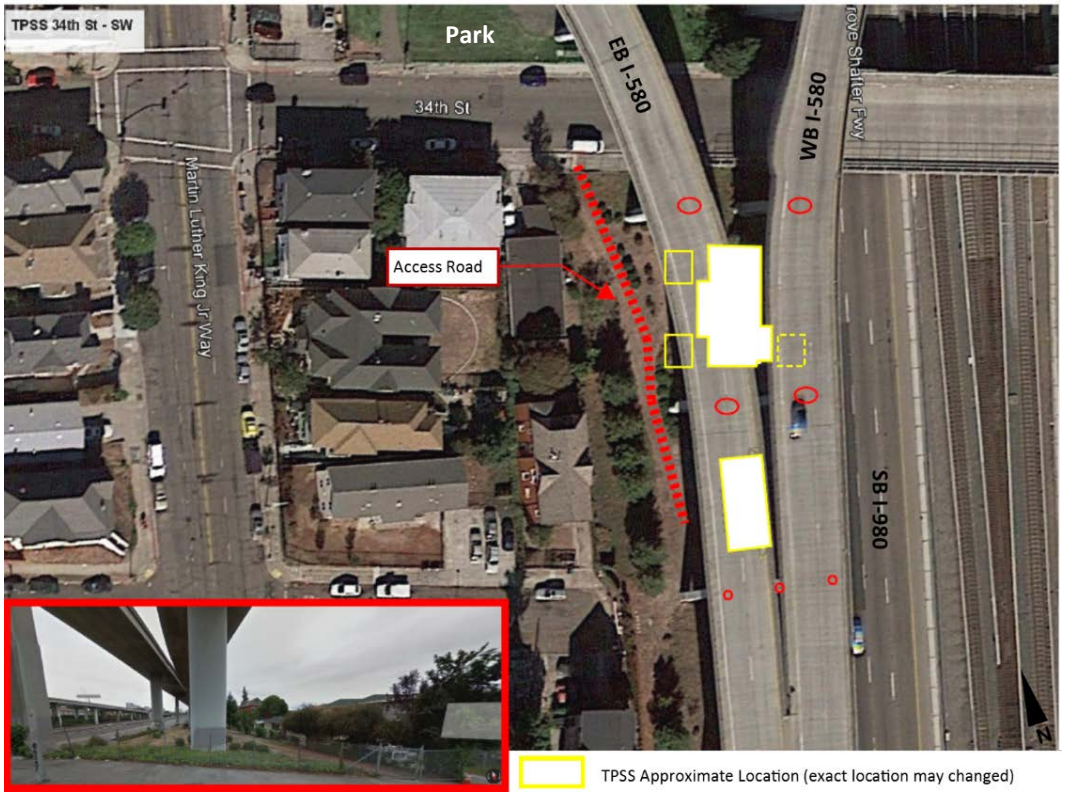
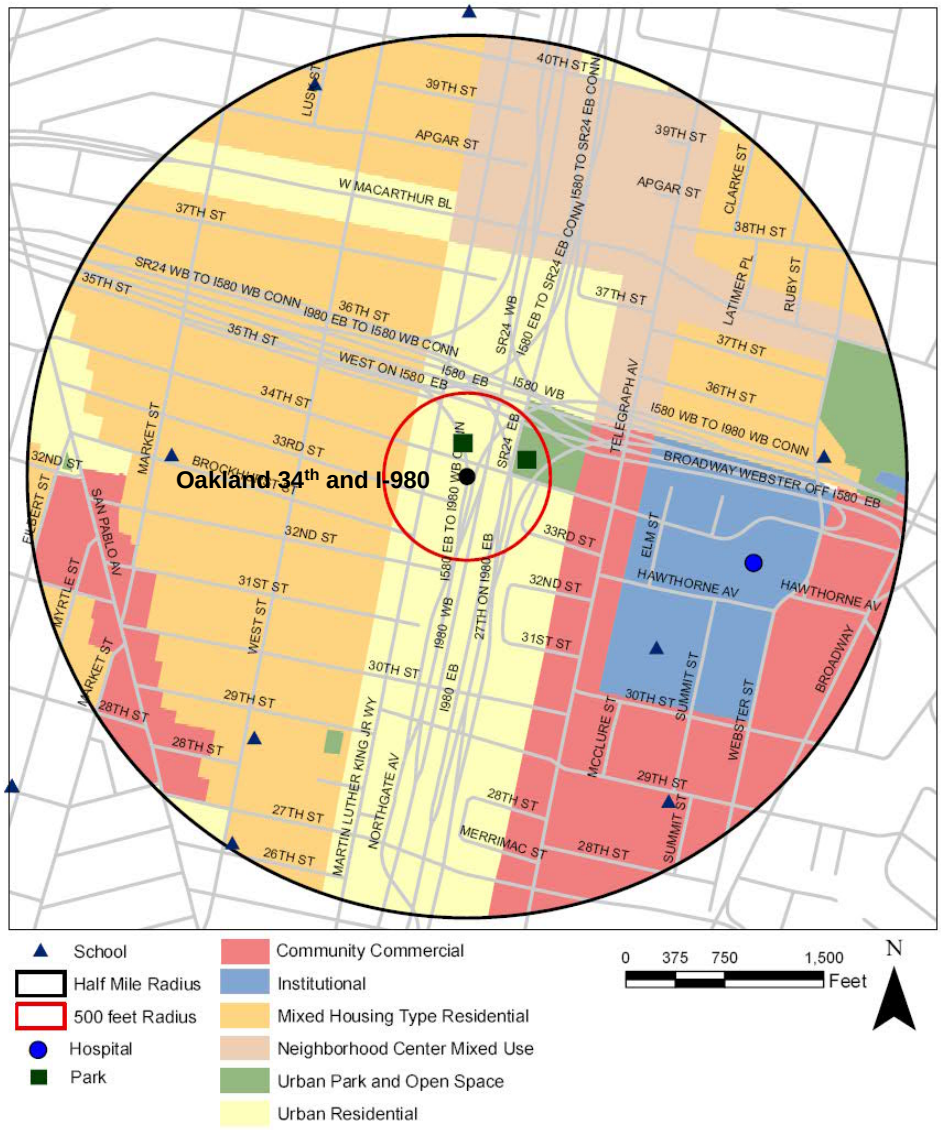


Figure 11: Oakland 34th Street and I-980 Substation Adjacent Land Use

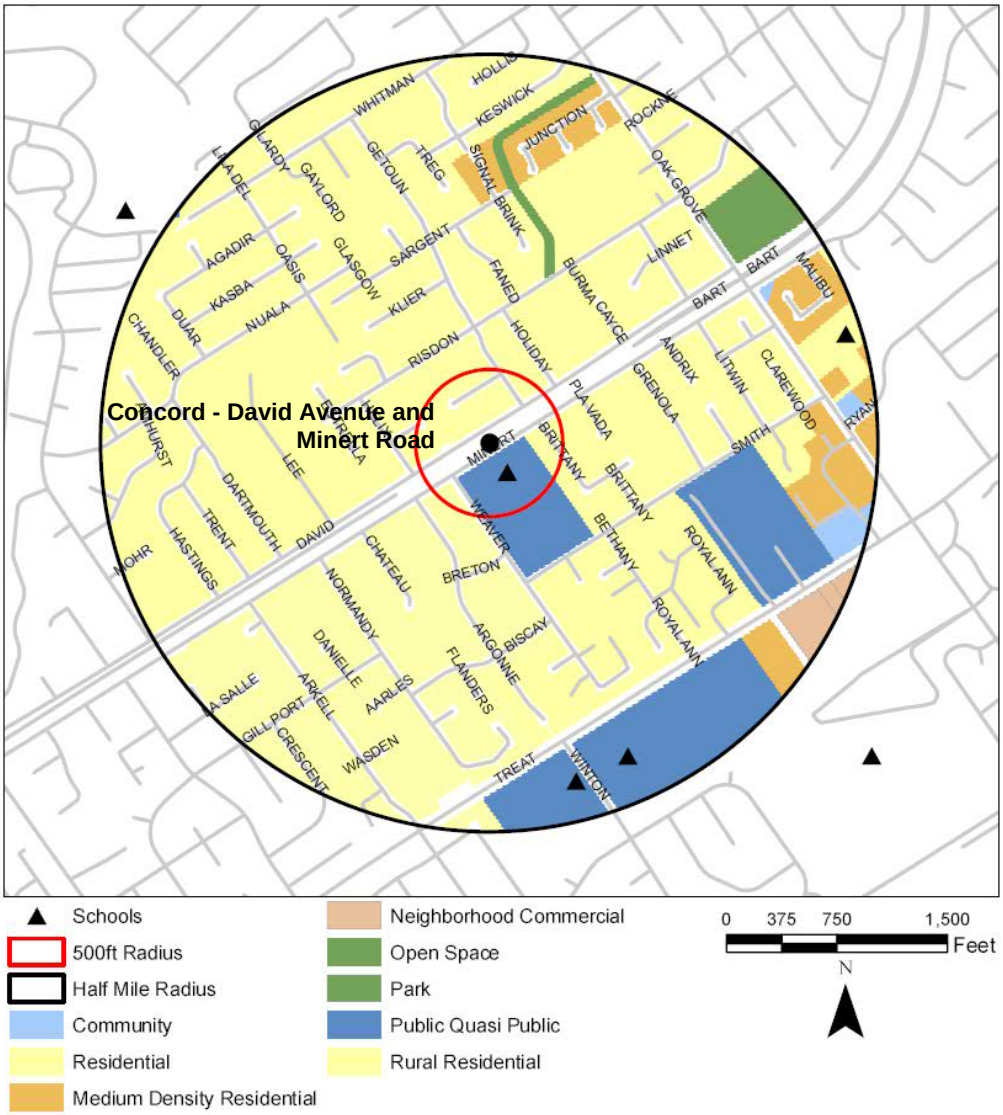


Concord - David Avenue and Minert Road

The site is located on BART's right-of-way south of BART's existing tracks and adjacent to Minert Road. The BART tracks are separated from all adjacent land uses by the two parallel arterial roadways on either side of the trackway, fencing, and vegetation. Minert Road is adjacent and parallel to the tracks on the south side, and David Avenue is adjacent and parallel to the trackway on the north side. The BART right-of-way is lined with vegetation at this point. Along the Minert Road side of the alignment, trees and other vegetation screen the right-of-way, and on the David Road side of the alignment, a hedge of oleander bushes screens the alignment. A middle school is located across Minert Road from the TPSS site. There are residential land uses adjacent to the school and on the north side of the BART tracks and across David Avenue. The closest residential use is north of the BART tracks and across David Avenue approximately 130 feet from the TPSS. The TPSS would be across Minert Road and approximately 150 feet from the closest building of the middle school. **Figure 12**, **p.19**, shows the orientation and location of the TPSS facility relative to the middle school. In general, the TPSS is parallel to the BART trackway and to the roadways on either side of the trackway. The TPSS will be located completely within existing transportation right-of-way and will be consistent with the existing transportation land use. Consistency with land use and zoning is further discussed in in Topic D, *Land Use and Zoning*, starting on **page 24.**

Figure 12: Location of Concord David Avenue and Minert Street TPSS

Figure 13: Concord - David Avenue and Minert Street Substation Adjacent Land Use



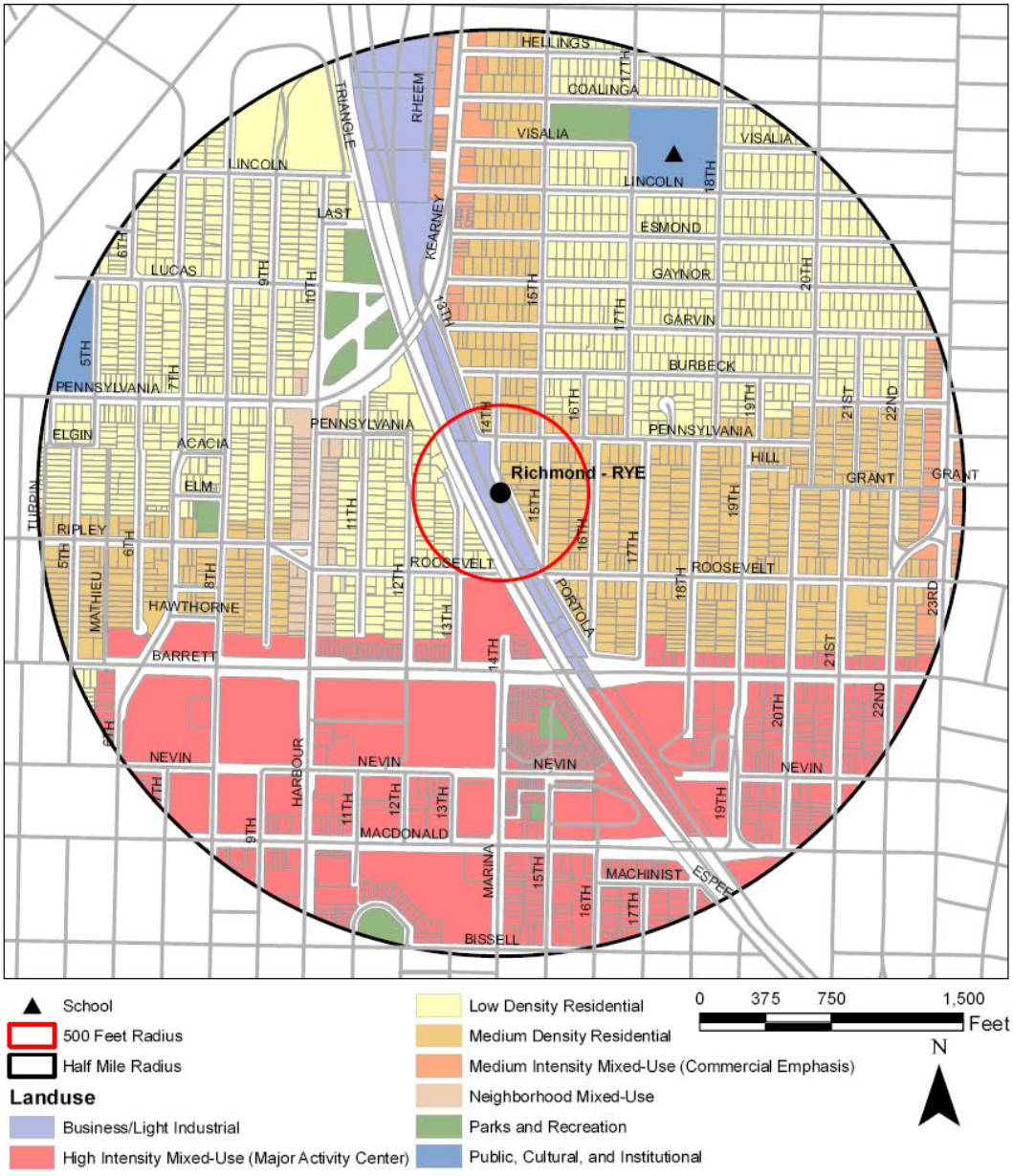
Note: According to the City of Concord general plan. The Public Quasi Public designation is applied to property owned by governmental entities and to semi-public facilities and it includes: Airport, hospitals, schools, government offices, corporation yards, and public facilities such as recycling centers, sewage treatment facilities and fire stations.

Richmond - RYE Gap Breaker Conversion

The TPSS site is on BART right-of-way between BART's existing railyard and Portola Avenue, and adjacent to an active Union Pacific and Amtrak railroad right-of-way. This site involves converting an existing gap breaker station to a TPSS. The TPSS would be consistent with the existing land use that currently includes the BART railyard and the UPRR/Amtrak railway tracks as illustrated in **Figure 14**, **p.21.** Several residential units are located on the opposite side of Portola Avenue from the site. The TPSS will be located completely within existing transportation right-of-way and will be consistent with the existing transportation land use. Consistency with land use and zoning is further discussed in Topic D, *Land Use and Zoning*, starting on **page 24**.

Figure 14: Richmond RYE Gap Breaker Conversion Location

Figure 15: Richmond Substation Adjacent Land Use



C. METROPOLITAN PLANNING AND AIR QUALITY CONFORMITY

The MPO for the San Francisco Bay Area is the Metropolitan Transportation Commission (MTC). The Regional Transportation Plan (RTP), called Plan Bay Area, was adopted in 2013 and amended in 2015. FTA and FHWA determined that the amended plan conforms to the State Implementation Plan for air quality on October 29, 2015.

On July 26, 2017, MTC adopted Plan Bay Area 2040. The Plan Bay Area 2040 Transit Project List (Appendix A to the Transportation-Air Quality Conformity Analysis for Plan Bay Area 2040 and Amended 2017 Transportation Improvement Program) includes BART's Transbay Corridor Core Capacity Project (all four major scope elements) as a fully-funded capital project. The RTP ID Number for the capital elements is 17-10-0006. The Transit Project List also states that the Core Capacity Project will be implemented in coordination with the BART Metro Program + Bay Fair

Connector, which includes the future service plan for 12-minute headways on all BART lines in the peak period (instead of current 15-minute headway) following implementation of the capital projects in the Transbay Corridor Core Capacity Project. The RTP ID Number for the BART Metro Program is 17-10-0005.

MTC performed the necessary studies to demonstrate air quality transportation conformity prior to adoption of Plan Bay Area 2040. MTC's plan-level conformity analysis included the fleet expansion element of the Transbay Corridor Core Capacity Project and the resulting BART Metro Program service plan with the more frequent 12 minute headways for the BART system. The remaining components of the Core Capacity Program – HMC Phase 2, CBTC and Traction Power Substations – are exempt from conformity analysis under 40 CFR 93.126 (As a fleet expansion, the acquisition of 306 vehicles is not exempt from conformity analysis.). Thus, BART's complete Transbay Corridor Core Capacity Program is included in an adopted, fiscally constrained regional transportation plan that is in conformance with the State Implementation Plan.

Non-exempt projects also require project-level air quality conformity, once they are included in a conforming regional plan with plan-level conformity. The railcar element of the Transbay Corridor Core Capacity Project is the one non-exempt element requiring project-level conformity. The vehicles are electrically powered, and more frequent service and increased capacity would tend to reduce VMT. On June 23, 2016, BART presented the Transbay Corridor Core Capacity Program to MTC's Air Quality Conformity Task Force (AQCTF) for information. Following adoption of Plan Bay Area 2040, which gives BART's Transbay Corridor Core Capacity Project BART plan-level conformity, BART returned to the AQCTF on August 24, 2017 and presented the project assessment finding that the Transbay Corridor Core Capacity Program is not a project of air quality concern under 40 CFR 93.123 (b)(1) for PM_{10} and/or $PM_{2.5}$, and a hotspot analysis is not required. The Task Force agreed and confirmed that the project is not a project of air quality concern.

The 2015 Transportation Implementation Plan (TIP) was adopted by the MTC on September 24, 2014 and was amended in 2015. FTA and FHWA last approved the conformity determination for the TIP on October 29, 2015. Appendix B to MTC's adopted Plan Bay Area 2040 includes an updated 2017 TIP with the elements of BART's Transbay Corridor Core Capacity Project as shown in **Table 2, page 23.**

Table 2: TIP ID in relation to the Core Capacity Project

Project Number	Name of the project	Air Quality Exempt Code	Explanation
TIP ID BRT030005	Traction Power System Renovation : *Replace obsolete elements and subsystems of the traction power system to maintain and improve reliability and safety*	2.08 - EXEMPT (40 CFR 93.126)	Reconstruction or renovation of transit buildings and structures (e.g., rail or bus buildings, storage and maintenance facilities, stations, terminals, and ancillary structures)
TIP ID BRT030004	Train Control Renovation: *Replace obsolete elements and subsystems of the train control system*	2.08 - EXEMPT (40 CFR 93.126)	Reconstruction or renovation of transit buildings and structures (e.g., rail or bus buildings, storage and maintenance facilities, stations, terminals, and ancillary structures)

D. LAND USE AND ZONING

The current zoning designation for HMC Phase 2 and surrounding areas is presented in the Final Negative Declaration [**Appendix A**]. HMC Phase 2 is consistent with the land use and zoning of the vicinity. No impacts are anticipated.

The current zoning designations around each of the five new TPSS are illustrated in **Figures 16** through **20, on pages 25 to 29**. Adjacent use maps are in Topic B, *Location*, starting on **page 11**. Each of the maps show a half mile radius and a 500 feet radius area. Schools within the vicinity of the proposed substation are identified on the land use map. Proposed TPSS sites are located in 4 different jurisdictions: San Francisco, Oakland, Richmond and Concord.

Zoning

Under state law (Cal. Gov. Code sections 53090 and 53091), local zoning and use permits under local zoning ordinances are not applicable to BART. Nevertheless, as shown below, the TPSS are compatible with existing zoning and land use. **Table 3**, on **pages 30** and **31**, shows the jurisdiction and existing zoning for the locations of each of the proposed TPSS. Four of the five proposed TPSS are located in existing BART right-of-way, and the fifth is within Caltrans right-of-way.

According to the San Francisco Municipal Code, zoning around Downtown San Francisco Civic Center substation is Downtown General (C3-G), and around Montgomery substation is Downtown Office (C3-O). Power substations are included in the use "Utility facility" of the Public Works Code.

Figure 16: Adjacent Zoning to Downtown San Francisco Civic Center Substation

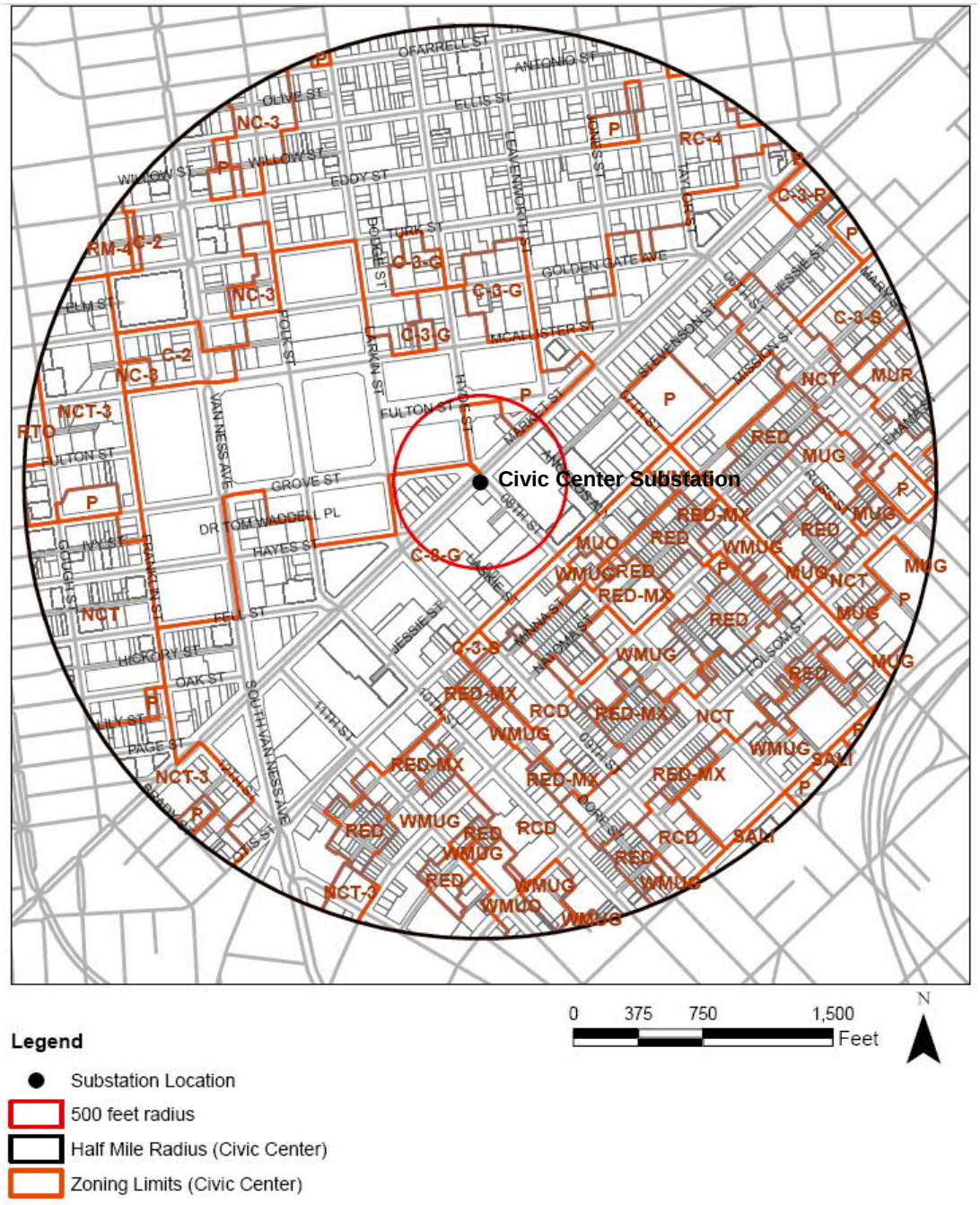
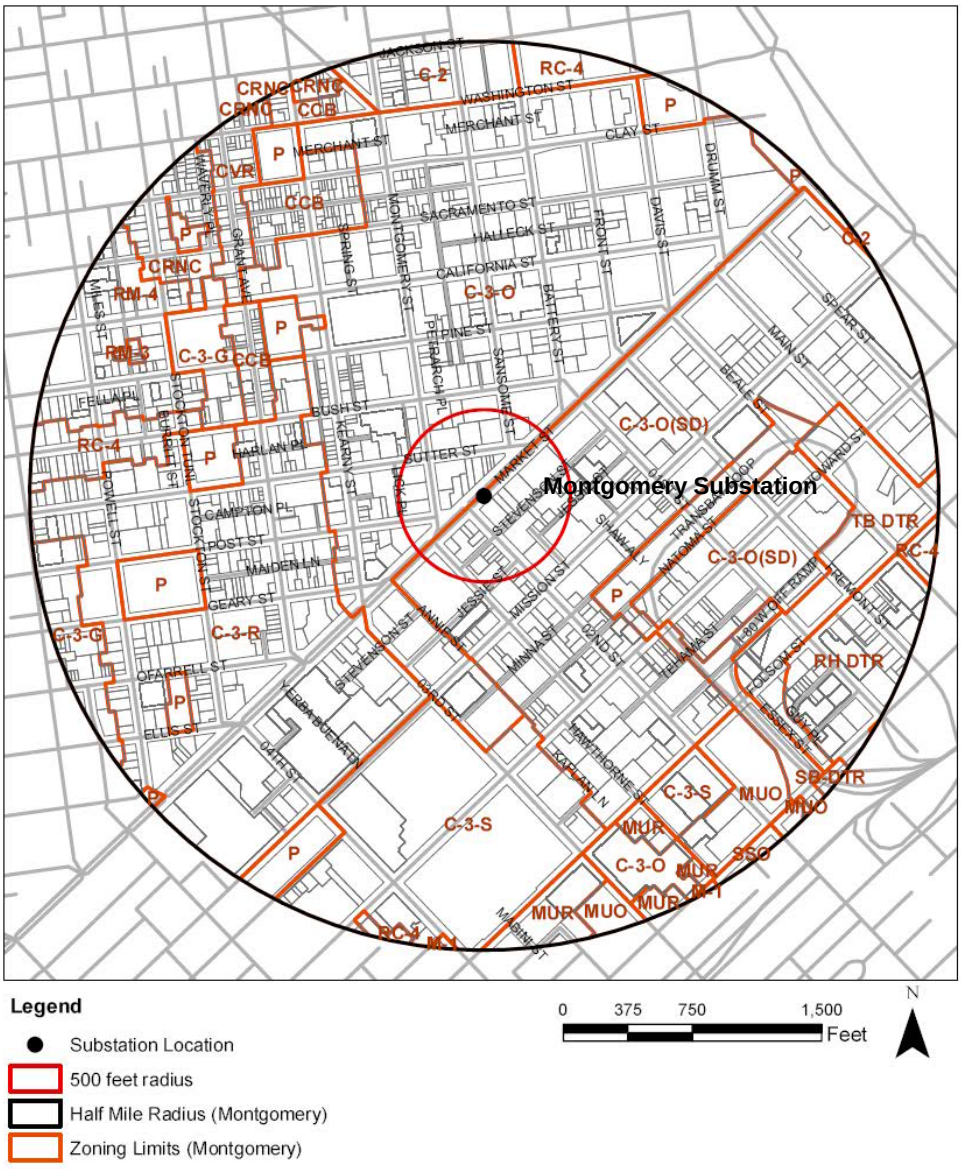


Figure 17: Adjacent Zoning to Downtown San Francisco Montgomery Substation



Zoning Categories according to the City and County of San Francisco Planning Code

Chinatown Mixed Use Districts
- *CCB: Community Business*
- *CRNC: Residential/Neighborhood*

Commercial
- *CVR: Visitor Retail*

Commercial District
- *C-2: Community Business*
- *C-3-G: Downtown General*
- *C-3-O: Downtown Office*
- *C-3-R: Downtown Retail*
- *C-3-S: Downtown Support*

Eastern Neighborhoods Mixed Use Districts
- *MUG: Mixed Use, General*
- *MUO: Mixed Use, Office*
- *MUR: Mixed Use, General*
- *WMUG: Western SoMa, Mixed Use, General*
- *WMUO: Western SoMa, Mixed Use, Office*

Neighborhood Commercial Transit Districts
- *NCT: Individual (Named, Controls vary)*
- *NCT-3: Moderate Scale*

Commercial Districts
- *RCD: Regional Commercial*

South of Market Mixed Use Districts
- *RED: Residential Enclave*
- *RED-MX: Residential Enclave Mixed Use*
- *SALI: Service/Arts/Light Industrial*
- *SSO: Service/Secondary Office*

Residential, Mixed (Houses & Apartments) Districts
- *RM-4: High Density (1 Unit per 200 sf)*

Residential Transit Oriented Districts
- *RTO: Residential Transit Oriented Development*

Industrial Light
- *M-1: Light Industrial*

Neighborhood Commercial Districts
- *NC-3: Moderate-Scale (3+ Commercial Stories)*

Public
- *P:* Public

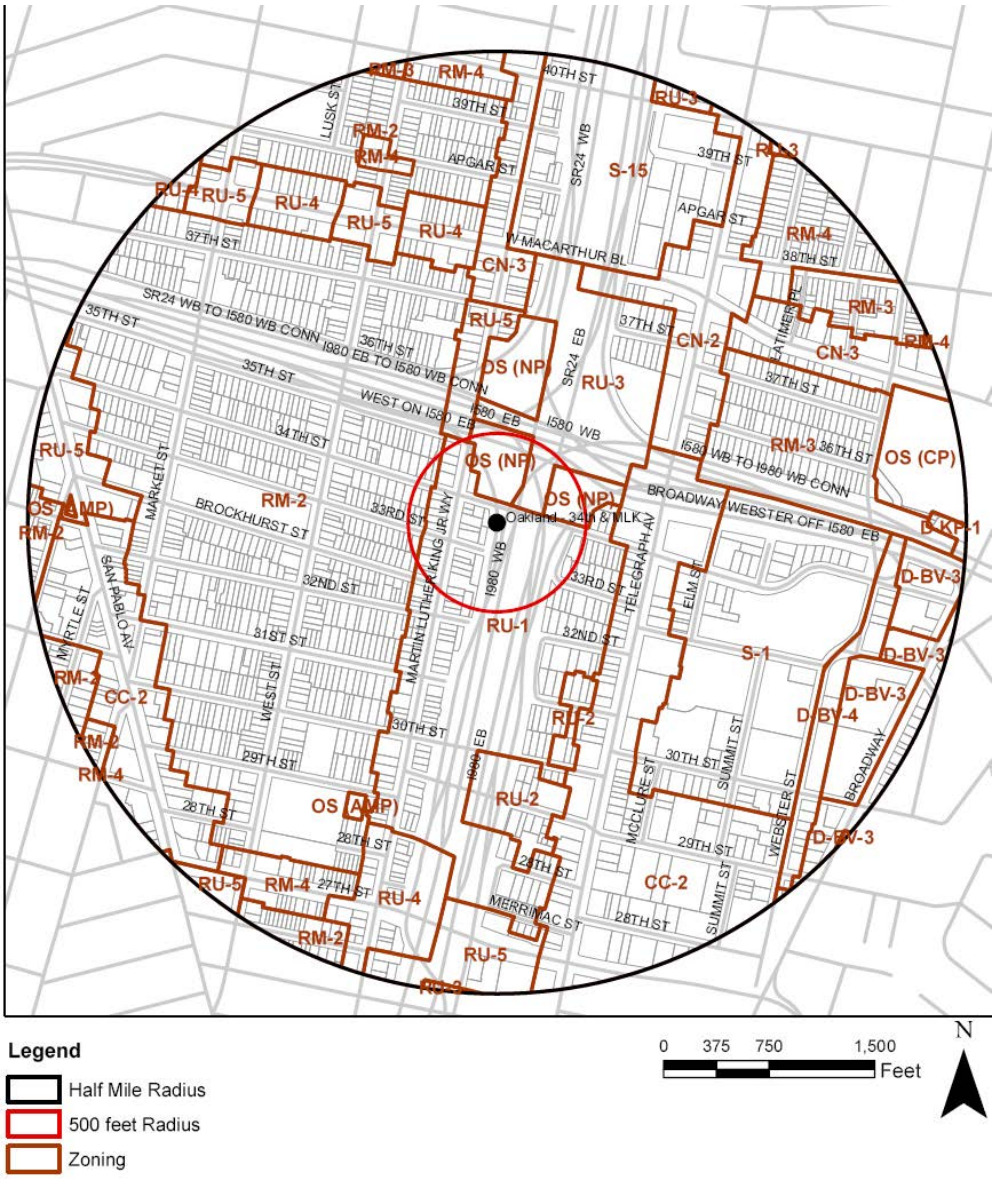
Residential, Mixed (Houses & Apartments) Districts
- *RM-3: Medium Density (1 Unit per 400 sf)*
- *RM-4: High Density (1 Unit per 200 sf)*

Downtown Residential District
- *RH DTR: Rincon Hill*
- *SB-DTR: South Beach*
- *TB DTR: Transbay*

Residential-Commercial Combined Districts
- *RC-4: High Density (1 Unit per 200 sf)*

The land surrounding the *Oakland - 34th Street and I-980 substation*, which is within Caltrans I-980 freeway right-of-way just south of 34th Street, is zoned Urban Residential (RU-1) according to Oakland Planning Code. Power substations are included in the use "Utility and vehicular Civic Activities".

Figure 18: Adjacent Zoning of Oakland 34th Street and I-980 Substation



Zoning Categories according to the City of Oakland Planning Code

CC: Community
CN: Neighborhood Center
D-BV: Broadway Valdez District
D-KP: Kaiser Permanente Oakland
OS-AMP: Active Mini-Park
OS-CP Community Park
OS-NP: Neighborhood Park
RM: Mixed Housing
RU: Residential Urban
S-1: Medical Center
S-15: Transit Oriented

The Concord David Avenue and Minert Road site is on BART right-of-way. No zoning is designated to this land in Concord Municipal Code. Power substations are included in the use "Utility facility transmission tower". Substations are allowed in areas with Residential zoning, which is the zoning for the properties across David Avenue from the proposed substation and adjacent to the Middle School across Minert Avenue from the proposed substation.

Figure 19: Adjacent Zoning of Concord David Avenue and Minert Road Substation

According to the City of Richmond Zoning Ordinance, land adjacent to the proposed *Richmond RYE Gap Breaker Conversion* Substation is zoned light industrial District (M2). Power substations are included in the use "Public utilities, major".

Figure 20: Adjacent Zoning of Richmond RYE Gap Breaker Conversion Substation

Zoning Categories according to the City of Richmond Planning Code

C-1: Neighborhood Commercial District
C-2: General Commercial District
CRR: Community and Regional Recreational District
M-2: Light Industrial District
MFR-1: Multifamily Residential District
MFR-3: Multifamily High Density Residential District
PC: Public and Civic Uses
SFR-3: Single-Family Low Density Residential District

Adjacent Uses

Existing land uses adjacent to the Downtown San Francisco TPSS locations include commercial (e.g.: retail, banks, restaurant, etc.), institutional, along with some multi-family residential along Market Street. Around the Downtown San Francisco Civic Center substation, public and institutional uses are dominant; these include library, park, schools, museum, governmental (city, state or federal) buildings. Downtown San Francisco Montgomery substation is located in the heart of the Financial District and offices are the main adjacent use. The proposed substations in downtown San Francisco are both entirely underground. The proposed vent grates for the TPSS are anticipated to be embedded in the sidewalk and will not have any visual impacts to the surroundings. No effects on adjacent uses are anticipated.

Existing land uses around the Oakland site in the I-980 right of way south of 34th Street include Interstate Highway (I-980), the BART tracks in the center of I-980, single and multi-families housing, and open spaces. The potential substation site is located under the existing freeway interchange ramp from EB I-580 to SB I-980, surrounded by multiple freeway columns. It will add a visual element among existing freeway support columns and other freeway and transportation facilities, between the existing residential uses to the west of the site and the I-980 freeway mainline to the east. Residential uses are shielded by the interspersed freeway columns, fencing and a row of trees. The TPSS would be placed in a context of transportation uses characterized by the presence of the freeway ramps overhead, and the freeway mainline and BART trackway to the east.

The immediate land uses adjacent to the Concord (David Avenue and Minert Road) Substation are two arterial roadways; that flank the BART trackway. The proposed substation is to be located within BART right-of-way across Minert Road from Oak Grove Middle School and will introduce a visual element between the school and the BART tracks. The existing land use north of David Avenue is single family housing (low-density residential), as is the land use on either side of the Oak Grove Middle School.

The proposed Richmond RYE Gap Breaker Conversion substation will convert BART's existing gap breaker station at the Richmond Yard to a TPSS. The site is contained entirely within BART's existing right-of-way near the intersection of Portola Avenue and 15th Street. Existing adjacent land uses include Class 1 railroad operations (Union Pacific and Amtrak), light industrial uses (BART railyard) and single family housing on the opposite side of Portola Avenue.

Table 3: Adjacent Zoning

Substations	Jurisdiction	Adjacent Zoning	City Zoning Classification
Civic Center Station	City and County of San Francisco	C3-G: Downtown General	"**Utility facility**" shall mean pipes, wires, tracks, conduits, tunnels, poles or other overhead supporting structures, with any appurtenances, or any other structures of any nature, upon, in, over or **under the streets** or places of the City and County of San Francisco which are used for the purpose of supplying or conveying any services or substances within the limits of the City and County of San Francisco
Montgomery Station	City and County of San Francisco	C3-O: Downtown Office	
Oakland I-980 & 34th street	City of Oakland	RU-1: Urban Residential	Zoning Code art. 17.19.030 Utility and vehicular civic activities. […] include the maintenance and operation of the following installations: B. Electrical Substations

Substations	Jurisdiction	Adjacent Zoning	City Zoning Classification
Concord – David Avenue and Minert Road	City of Concord	BART right of way - No Zoning in Concord Plan	"Utility facility, transmission towers" means a facility that provides a fixed base structure or facility serving as a junction point for transferring electric utility services from one transmission voltage to another or to local distribution and service voltages, and similar facilities for water supply and natural gas distribution. These uses include any of the following facilities that are not exempted from land use permit requirements by Government Code Section 53091: Electrical substations and switching stations, etc.
Richmond RYE Gap Breaker Conversion	City of Richmond	M2: Light Industrial District	Public utilities, major means generating plants, **electrical substations**, switching buildings, refuse collection processing, recycling or disposal facilities, water or waste treatment plants, and similar facilities of public agencies or public utilities.

The TPSS facilities and CBTC would be placed in areas already used predominantly for transportation purposes. They would be in BART or Caltrans right-of-way located next to BART's existing tracks and thus, such uses are consistent with existing zoning and land use. Typical TPSS facilities contain electrical equipment housed in pre-fabricated metal enclosures of rectangular shape approximately 12 feet in height, 40 feet wide, and 60 feet long. The project would not have any impacts on land use and zoning.

E. TRAFFIC AND PARKING IMPACTS

The program would not have any impacts on on-street or off-street parking because the improvements would be in either BART's or Caltrans' existing transportation right-of-way in areas not accessible to the public for automobile use. It would not change existing parking at BART stations, feeder bus service serving BART stations, or roadway lanes and signals. There would be no permanent loss of on-street or off-street public parking.

The program would expand Transbay Corridor rail capacity to meet existing demand and relieve overcrowding on trains. It will also position BART to better accommodate ridership growth, consistent with growth trends in the Bay Area. Plan Bay Area projects population to increase by 30% by 2040, much of which will be located close to BART stations.

F. CO HOT SPOTS

The Counties of Alameda, Contra Costa, San Francisco, San Mateo and Santa Clara are in a Federal attainment/maintenance area for CO and, also in attainment on the State level.

Since the project is in a Federal maintenance area, the project cannot have CO impacts substantial enough to cause violations of standards. A proposed project is likely to have an acceptable level of emissions compared to a No-Build condition if it is determined that it meets the following criteria:

- The project does not substantially increase (greater than two percent) the number of vehicles operating in cold start mode (starting a vehicle with a cold engine).

- The project does not substantially increase traffic volumes (i.e., increases greater than five percent).
- The project improves traffic flow (i.e., higher average speeds (up to 50 miles per hour) should be regarded as an improvement for uninterrupted roadways.
- A project that causes an insignificant increase in emissions may only be deemed satisfactory if the project does not move traffic closer to a receptor.

The expansion of the BART fleet by adding an additional 306 cars and other elements of the Transbay Corridor Core Capacity Program would meet all the criteria listed above. The railcars being procured for the program are electrically-powered and do not create emissions. The project is anticipated to relieve current overcrowding onboard trains and provide additional capacity for new transit riders, which could lead to reduced VMTs. Thus, the program would not cause any new localized CO exceedances of federal standards, generate emissions that would worsen existing violations or delay timely attainment of standards. On August 24, 2017, MTC's Air Quality Conformity Task Force agreed that the program is not a project of air quality concern.

G. HISTORIC RESOURCES

Historic resources will not be affected by the project. Installation of a new CBTC train control system will be contained wholly within BART's existing right-of-way and station structures, and will not affect historic resources.

HMC Phase 2 –was assessed in the Final Negative Declaration [**Appendix A**] and addenda for HMC [**Appendix B** and **Appendix C**], which concluded that Phase 2 of the facility would have no impacts on historic resources. The Negative Declaration notes that research, reviews of historic maps and aerials, and a pedestrian survey did not indicate the presence of known historical resources within the project site or within a ½-mile radius of the site and the track work area south of Whipple Road.

The new TPSS facilities are all within existing BART or Caltrans right-of-way. No historic resources will be affected. The three new East Bay TPSS sites are not located within or near a historic district or property. These three substations will not result in any substantive changes to the landscape or view shed proximate to these rights-of-way. The following sections provide more detail on the two new traction power substations in San Francisco, and support the conclusion of no impact.

Area of Potential Effects (APE)

The National Historic Preservation Act (NHPA) of 1966, as amended (16 USC § 470, et seq.) requires the FTA to take the effects of its undertakings on historic properties into account. As part of the Section 106 process, a geographic buffer is developed to assess impacts on cultural resources and referred to as an Area of Potential Effects (APE).

An Area of Potential Effects (APE) was developed to review the existing historic resources in relation to the new project elements. Since the two downtown San Francisco TPSS facilities are entirely within current underground station structures, the APE for the San Francisco structures is the sidewalk area that will include access points and ventilation grates on the surface, all embedded in the current operational footprint. Therefore, no ground level visual buffer was assumed as part of the development of the APE.

Historic Structures and Districts

The two TPSS facilities in San Francisco would be located within current underground station structures. The *Downtown San Francisco Civic Center* substation would be located in the *San Francisco Civic Center Historic District* according to Article 10 of the Planning Code of the City and County of San Francisco and the National Register of Historic Places (NRHP). There are also

existing historical landmarks within a 1000 feet radius from the *Civic Center* and *Montgomery* substations. The Historic District and Landmarks are identified in **Table 4** (**p. 33**), **Table 5** (**p. 34**), **Figure 21**, (**p.35**), and **Figure 22** (**p.35**)Since substations will be located entirely underground; the substations will not have any effect on historical landmarks or districts.

Each of the two new substations in downtown San Francisco will require new vent grates for ventilation purposes. The anticipated vent grates are to be embedded in the sidewalk pavement at-grade similar to existing vent grates, and are not expected to introduce any visual elements along the Market Street corridor. The initial design of the vent structures was closely reviewed for any potential impacts to the Market Street historic district and/or to adjacent historic structures. BART is collaborating with the City and County of San Francisco regarding the number, location, size, and exterior appearance of these facilities and is committed to have the design be context sensitive in its use of materials. The final decisions will be made during final design.

At Civic Center, two existing passenger entrance portals will be removed to facilitate the placement of the TPSS underground. One of these entrances, near the corner of Market Street and Grove Street, is within the Civic Center Historic District. The removal of this portal structure would not have any adverse visual effect. An overall improvement to the visual quality is anticipated. Based upon a conversation that took place between FTA and the California State Historic Preservation Office (SHPO) on November 17, 2016, BART will not need to consult with the SHPO regarding the closure of the station entrance at Market and Grove Streets in San Francisco's Civic Center Historic District. No contributing structures are being removed, no new structures are being constructed, and there will be no expansion of the station or increased depth of disturbance associated with the installation of the TPSS. Additionally, the station entrance itself does not contribute to the significance of the historic district. Therefore, the closing of the entrances will have no adverse impact on the historic district.

As mentioned earlier, for Montgomery and Civic Center Substations, the TPSS ventilation would be through grates embedded in the sidewalk, at-grade. Design of the grates would be context sensitive. The surface level grates embedded in the sidewalk will not create any adverse visual impact to historic resources in the surrounding area.

Sources used for this analysis include the GIS database from the City and County of San Francisco[5] Planning Department and the GIS database from the NRHP[6], which includes both nationally and locally designated historic resources.

Table 4: List of Historic Districts in the Vicinity of the Proposed Civic Center TPSS

	Name	Listed under…	Boundaries	Station Included
A	**San Francisco Civic Center Historic District**	NRHP (78000757) and Article 11	Roughly bounded by Golden Gate Ave., 7th Street, Franklin, Hayes and Market Street	Civic Center

[5] City of San Francisco, *Map of the Landmarks and Landmark Districts as defined and listed in Article 10 of the San Francisco Planning Code*, available online: https://data.sfgov.org/Housing-and-Buildings/Landmarks/8ynb-89vj
[6] National Register of Historic Places, *Public, non-restricted data depicting National Register spatial data processed by the Cultural Resources GIS facility*, Available online: https://www.nps.gov/maps/full.html?mapId=7ad17cc9-b808-4ff8-a2f9-a99909164466

Table 5: List of Historic Buildings and Designated Landmarks in the Vicinity of the Proposed Civic Center TPSS[7]

	Name	Listed under…	Address	Close to which substation	Distance (feet)[8]
1	**Orpheum Theater Building**	Article 10 (#94)	1192 Market Street	Civic Center	215

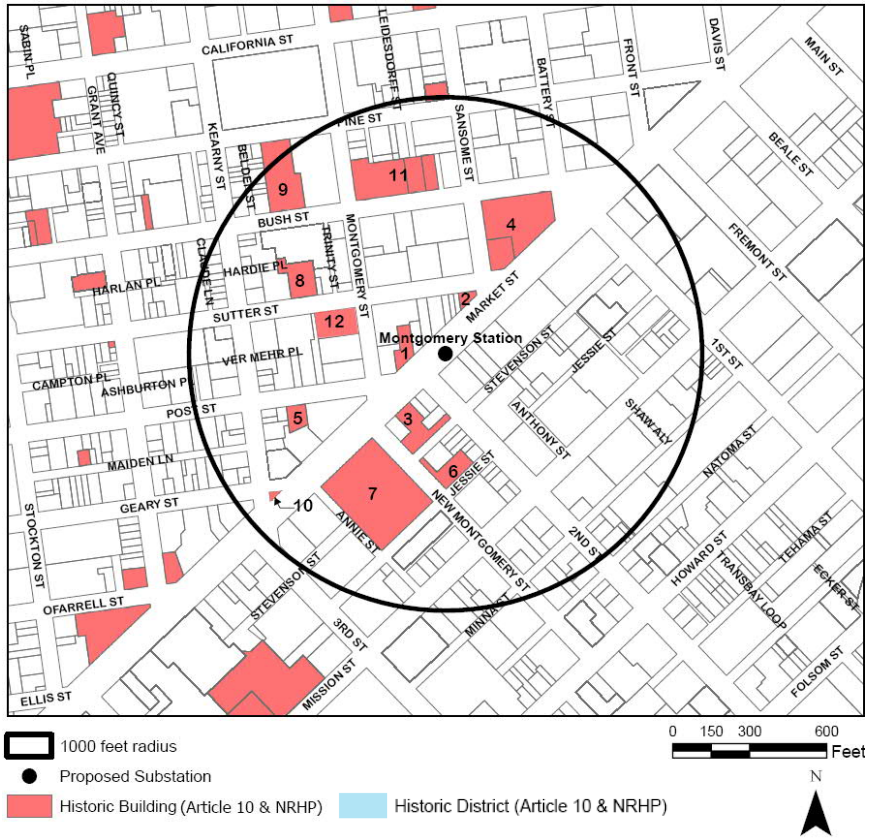
Table 6: List of Historic Buildings and Designated Landmarks in the Vicinity of the Proposed Montgomery TPSS9

	Name	Listed under…	Address	Close to which substation	Distance (feet)[10]
1	**Hobart Building**	Article 10 (#162)	582 Market Street	Montgomery	255
2	**Flatiron building**	Article 10 (#155)	1 Sutter Street	Montgomery	175
3	**Hoffman's Grill**	Article 10 (#144)	619 Market Street	Montgomery	340
4	**Crown Zellerbach Building**	Article 10 (#183)	1 Bush Plaza	Montgomery	315
5	**The Mechanics Institute**	Article 10 (#134)	57 Post Street	Montgomery	655
6	**Sharon Building**	Article 10 (#163)	36-63 New Montgomery Street	Montgomery	390
7	**Palace Hotel and Garden Court Room**	Article 10 (#18)	2 New Montgomery Street	Montgomery	640
8	**Hallidie Building**	Article 10 (#37) and NRHP (71000185)	130 Sutter Street	Montgomery	630
9	**SF Mining Exchange**	Article 10 (#113)	350 Bush Street	Montgomery	895
10	**Lotta Fountain**	Article 10 (#73) and NRHP (75000475)	Kearny Street	Montgomery	760
11	**Mills Building & Tower**	Article 10 (#76) and NRHP (77000334)	220 Montgomery Street	Montgomery	625
12	**Hunter-Dulin Building**	NRHP (97000348)	111, Sutter Street	Montgomery	390

[7] Source: NRHP GIS data and City and County of San Francisco GIS Data.
[8] Distances were calculated approximatively with Google Earth Tools.
[9] Source: NRHP GIS data and City and County of San Francisco GIS Data.
[10] Distances were calculated approximatively with Google Earth Tools.

Figure 21: Historic Buildings and District in Vicinity of Civic Center TPSS

Figure 22: Historic Buildings in the Vicinity of Montgomery TPSS



** Historical buildings and districts are listed and numbered in the tables above*

Archaeological and Native American Cultural Resources

Installation of the new CBTC train control system and the procurement of railcars are wholly within BART's existing rail and station right-of-way and operating envelope, and will have no impact on archaeological and Native American cultural resources.

For HMC Phase 2, the Negative Declaration [**Appendix A**] and the addenda for HMC **[Appendix B** and **Appendix C**] assessed the potential impacts on archeological and Native American cultural resources. The project, as defined, would not have any adverse effects on archeological and Native American cultural resources.

For the TPSS facilities, the proposed locations of the substations are all wholly within existing station structures or are in a previously excavated (disturbed) context for railroad or highway construction. Therefore, no effects to archeological and Native American resources are anticipated.

The two San Francisco TPSS facilities are wholly within the existing station structures for Civic Center and Montgomery stations. No excavations are anticipated, and the only surface disruption would be to rebuild small sections of the sidewalk on Market Street for the ventilation grates. The Market Street right-of-way has already been highly disturbed to a depth of approximately 80-100 feet for cut-and-cover construction of the underground BART system and stations in the 1960s and 1970s, and for modifications to the Market Street roadway and sidewalk.

The three East Bay TPSS facilities will be constructed within existing transportation rights-of-way that have already been disturbed for railroad, roadway, freeway and overpass construction. The Concord site was first disturbed when a railroad right-of-way was constructed on this alignment, and it was further disturbed in the 1960s when the right-of-way was rebuilt as BART. The Richmond site was first constructed as a railroad right-of-way , and was rebuilt for BART in the 1960s. The Oakland site was significantly disturbed beginning in the 1960s during construction of SR-24, I-580 and I-980. The site features multiple columns and footings for the freeway overpass structures that are overhead, and the site was graded and resloped to allow the adjacent freeway to be built in a below-grade trench configuration.

However, in an event that previously undisturbed soils are encountered, the following may be required:

- *Avoidance of Discovered Cultural Resources and Measures to Reduce Harm*: If evidence of an archaeological site or other suspected historic resource is encountered during construction, including darkened soil representing past human activity ("midden") that could conceal material remains (e.g., worked stone, faunal bone, hearths, or storage pit), all ground-disturbing activity within 100 feet of the find shall be halted and BART notified. BART will hire an archaeologist meeting the Secretary of the Interior's Standards for Professional Archaeologist to assess the find. Impacts to any significant resources may be mitigated through avoidance, data recovery, or other methods determined adequate by the qualified archaeologist and that are consistent with the Secretary of the Interior's Standards for Archeological Documentation. Any mitigation plan developed by the qualified archaeologist shall be approved by BART prior to implementation. Project-related ground-disturbing activities shall not be continued in the vicinity.

- *Avoidance of Discovered Human Remains and Measures to Reduce Harm:* If human remains, including disarticulated or cremated remains, are discovered during any phase of construction, all ground-disturbing activities in the vicinity and any nearby area reasonably suspected to overlie adjacent human remains shall be immediately halted. BART and the relevant County Coroner shall be notified immediately, in accordance with the Section 5097.98 of the State Public Resources Code and Section 7050.05 of California's Health and Safety Code. If the remains are determined by the county coroner to be Native American, it is the responsibility of the county coroner to inform the Native American Heritage Commission (NAHC) within 24 hours. The guidelines of the NAHC should be adhered to in the treatment and disposition

of the remains. BART shall retain a qualified archaeologist who meets the Secretary of the Interior's Standards for Professional Archaeologist and with Native American burial experience to conduct a field investigation of the specific site and consult with the person identified as the Most Likely Descendent, if any, identified by the NAHC. BART shall approve any mitigation recommended by the qualified archaeologist prior to implementation, taking account of the provisions of State law as set forth in the CEQA Guidelines Section 15064.5(e) and Public Resources Code Section 5097.98. Approved mitigation must be implemented before resumption of ground-disturbing activities in the vicinity.

In such cases, coordination with the SHPO and consultation with Native American tribes will be required. However, there are no potential archeological discoveries anticipated due to the already developed nature of the locations of the project elements.

H. NOISE

In October 2016, a Noise and Vibration Technical Report was completed to assess the potential for ongoing airborne noise impact to noise-sensitive land use located in the proximity to new and refurbished TPSS and the new communication-based train control system [**Appendix I**]. Screening distances were used from the candidate sites for new and upgraded TPSS to assist with the initial evaluation of potential noise impacts and site visits were conducted on March 17 and June 8, 2016 for the East Bay and March 30 and June 23, 2016 for San Francisco.

Table 7: List of noise sensitive receptors and the closest distance to the TPSS site

TPSS Location	Sensitive Use	Distance to Nearest Receptor (feet)
Downtown San Francisco - Civic Center	Residential with no open windows, Orpheum Theater, Public Library, and City College	15*****
Downtown San Francisco - Montgomery	Urban with few sensitive land uses	15*****
Oakland 34th Street and I-980	Residential and Grove Shafter Park	85
Concord - David Avenue and Minert Road	Residential and Oak Grove Middle School	110
Richmond - RYE Gap Breaker Conversion	Residential	100

**Distance from ventilation system intake or discharge grill in sidewalk with receptor at approximately > 15 feet from grill.*

Noise-sensitive uses were identified for each potential TPSS site and measurements of existing ambient noise measurements were conducted at the East Bay locations between June 20 and 24, 2016. Six long-term (24 hours or longer) measurements were conducted and nine short-term (typically 15 minutes) measurements were performed. Measured long-term existing average day-night sound levels (L_{dn}) varied between 64 and 76 decibels. The calculated L_{dn} levels for the short-term measurement locations varied from 57 to 83 decibels.

Existing baseline community noise information developed by the City and County of San Francisco in 2008 was used for the San Francisco TPSS locations. Modeled L_{dn} levels based on the City and County of San Francisco database indicated that levels vary between 74 and 76 decibels.

Because the specific equipment and layout of each final TPSS location has not yet been determined, it is not possible to accurately predict the TPSS noise emission levels and calculate noise impacts at the time of the preparation of this report. BART's practices in TPSS design is to develop the TPSS component specifications, equipment layout and ancillary features such as a perimeter screen wall that would avoid impacts to the vicinity of the final TPSS locations. This approach is consistent with

the process used for the Warm Springs Extension. The Noise and Vibration Technical Memorandum provides noise impact avoidance criteria at the approximate boundary of each TPSS site as referenced in Section 3.4.2 and Table 3-4 with TPSS acoustic noise emission performance consistent with the limit criteria levels, the project will avoid noise impacts at any identified noise-sensitive land uses in the vicinity of the TPSS facilities.

Design and installation best practices will help TPSS sites perform within or under the noise thresholds. BART (or its contractor) will monitor the noise levels post deployment. Noise levels will be compared with the thresholds, and a sound wall or other noise reduction mechanisms will be installed if the threshold is exceeded. Operations and performance standards of recently installed TPSS (e.g., Warm Springs) will additionally inform this entire process of design, installation and operations.

No perceptible noise is expected from operation of the communication-based train control system.

HMC was the subject of a separate noise report done by Wilson Ihrig in 2011 **[Appendix K**], and updated by Wilson Ihrig in 2014 [**Appendix L**] and 2017 [**Appendix M**]. The latest review found that the noise levels in areas adjacent to HMC Phase 2 would not exceed the FTA threshold for Moderate Impacts and thus, no impacts are anticipated. In the original Negative Declaration, Phase 2 was to include a soundwall (SW-3) to be built at the property line to shield residences north of the site. In Addendum 2, based on Wilson Ihrig's 2014 analysis, the sound wall was moved from the property line and replaced with a short wall atop an existing ramp structure in approximately the same relationship to the adjacent residences. In its 2017 analysis, Wilson Ihrig determined that the ramp structure itself was sufficient to avoid a moderate impact, without the short wall on top. The original Negative Declaration also determined that another soundwall (SW-4) would be needed for Phase 2. SW-4 has already been built as part of Phase 1. Therefore, since all required sound walls were already built during Phase 1, no additional sound wall would be built under HMC Phase 2.

I. VIBRATION

The Negative Declaration [**Appendix A**] and addenda for HMC **[Appendix B** and **Appendix C**] assessed the potential impacts on vibration. The project as defined includes several design and best practices measures that will be implemented to ensure that there are no vibration impacts. Measures to reduce the effect of vibration include vibration reducing technology and construction vibration best management practices.

The program does not involve new or relocated trackway outside of HMC Phase 2. Operation of neither the TPSS nor the communication-based train control system will generate any ground-borne vibration impacts. Temporarily elevated vibration levels could result from construction activities associated with reworking and constructing new TPSS. These activities may include demolition, grading, minor excavation, foundation fabrication, paving and installation of systems components. No high vibration producing activity such as pile driving is anticipated to be necessary for the installation of the TPSS or the CBTC equipment. While the construction vibration may be briefly elevated, the change would not be substantial and would not create significant impacts[11].

J. ACQUISITIONS & RELOCATIONS REQUIRED

Implementation of the program will be on BART and Caltrans right-of-way. It will not result in displacements of residences or businesses. Caltrans is supportive of the use of their property based on the initial conversations between BART and Caltrans and a field meeting at the site on August 15, 2016. No full acquisitions or easements are required. BART has begun the process of negotiating a cooperative agreement with Caltrans for use of I-980 right-of-way for the Oakland 34th Street and I-980.

[11] Appendix H: Core Capacity Noise and Vibration Technical Memorandum, October 2016, p.37.

K. HAZARDOUS MATERIALS

The Final Negative Declaration [**Appendix A**] and addenda for HMC [**Appendix B** and **Appendix C**] assessed the potential for encountering hazardous materials. Although there are no known sources of groundwater pollution on the HMC site, the HMC Negative Declaration includes mitigation provisions if unknown contamination is discovered that includes remediation of contaminated sites prior to construction. The Negative Declaration makes note of a previous spill of chemicals stored in underground storage tanks on the Univar (formerly Chem Central) property, approximately 1/8 to 1/4 mile south/southwest of the HMC site. The contamination is not on HMC site, and the contamination plume is moving away from the HMC site. No effects are anticipated.

None of the proposed substations would be located on sites identified by the State Water Resources Control Board (SWRCB) as presenting contamination[12]. Thus, no effects are anticipated at the time.

Based on current land use, the TPSS site located in Richmond has a potential risk of contamination due to its proximity to railyard. Metal, oil and gasoline contamination is often encountered in railyards. However, the installation of a TPSS involves only minimal subsurface ground disturbance. Therefore, no encounters with hazardous materials are anticipated. Any identified environmental site conditions that may represent a risk to public health and safety will be remediated in accordance with federal, state, and local environmental laws and regulations. The appropriate federal, state and local parties would be notified if site conditions that represent a risk to public health are identified.

Record Search

The California SWRCB GeoTracker website was searched for publicly available records for cleanup sites in the Leaking Underground Storage Tank (LUST) and Cleanup Program databases. The GeoTracker website also includes documentation for the Department of Toxic Substances Control (DTSC) EnviroStor database as a separate layer. Sites that were identified in close proximity to the TPSS sites on the GeoTracker website were reviewed to obtain information and documents regarding the known or potential extent of contamination related to those facilities.

Civic Center TPSS

The GeoTracker website identified three listings, which constituted one property within the vicinity of the Civic Center TPSS location. The property at 1169 Market Street in San Francisco is in the EnviroStor and LUST database. The 4-acre site is situated east of the intersection of Market Street and 8th Street, adjacent east of the Civic Center TPSS site. According to a 2003 Voluntary Action Agreement with DTSC, the property contained a waste paint consolidation area. The first LUST incident was closed in 1995. The results of the DTSC voluntary action review to determine whether additional characterization and/or cleanup of the property is unknown. Another UST was discovered during construction activities in May 2016. This UST was found to be leaking; however, adequate impacted soil was removed from the premises, and the incident was closed in July 2017.

Montgomery Station TPSS

Two nearby listings were found within the GeoTracker website, which constituted one property near the Montgomery Station TPSS site. The Former Chevron Building at 555/575 Market Street is adjacent southeast of the TPSS site and in the LUST database. The first LUST incident was discovered in 1996 and the facility received a Closure/No Further Action Level in 1997. The second LUST incident was discovered in 1998 and the facility was issued a closure in July 2000.

The listings noted above will not have any direct or indirect effects on the two underground TPSS sites in downtown San Francisco in Civic Center and Montgomery Stations. Installation of the two

[12] State Water Resources Control Board (Geotracker) *http://geotracker.waterboards.ca.gov [Accessed on April 10, 2016]*

TPSS sites will occur entirely within the existing station boxes and will not involve any excavation of soil.

Oakland south of 34th Street in I-980 right-of-way

The GeoTracker website did not identify any facilities within close proximity of the Oakland TPSS site.

Concord David and Minert Road:

The GeoTracker website did not identify any facilities within close proximity of the Concord TPSS site.

Richmond RYE Gap Breaker

The GeoTracker website did not identify any facilities within close proximity of the Richmond TPSS site. As already mentioned in the chapter text, this TPSS is in close proximity to a railyard, which is a potential concern due to heavy metals, volatile organic compounds, semi-volatile organic compounds, pesticides, and herbicides (for weed suppression).

In case larger excavations are required at any of the substation sites, any potential impacts can be addressed through standard measures below:

- Further Soil and Groundwater Investigations Prior to any Construction Activities
- Remediation of Contaminated Sites Prior to Construction
- Cease Work in the Event of Discovered Environmental Contamination During Construction.

L. COMMUNITY DISRUPTION AND ENVIRONMENTAL JUSTICE

BART, as a recipient of federal funds, is required by the FTA to comply with Title VI of the Civil Rights Act of 1964 and its amendments (Act). Title VI of the Civil Rights Act of 1964 requires that no person in the United States, on the grounds of race, color or national original be excluded from, be denied the benefits of, or be subjected to discrimination, under any program or activity receiving federal financial assistance. Presidential Executive Order 12898 "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" addresses environmental justice in minority and low income populations. Presidential Executive Order 13166 "Improving Access to Services for Persons with Limited English Proficiency" addresses services to those individuals with Limited English Proficiency (LEP).

FTA Circular 4702.1B, dated October 1, 2012, entitled *Title VI Requirements and Guidelines for Federal Transit Administration Recipients* (Title VI Circular) and FTA Circular 4703.1, dated August 15, 2012, entitled *Environmental Justice Policy Guidance for Federal Transit Administration Recipients* (EJ Circular), require that federal funding recipients, such as BART, review its transportation decisions to ensure equity in the transportation decision making process and to ensure that decisions are not made on the basis of race, color, national origin or socioeconomic status.

The existing BART system covers large portions of the Bay Area and bisects a number of communities, including designated minority and low-income populations. Below is an analysis of potential impacts, if any, from the project on Title VI/Environmental Justice (EJ) communities.

Expansion of the railcar fleet (306 vehicles)

Passengers will benefit from the additional revenue vehicles which will lead to less crowding and increased train frequencies distributed throughout the BART system. The actual train operating schedules will be established closer to the project opening date and staff will make every effort to

ensure equitable distribution of vehicles. Additionally, the Title VI service monitoring process reviews vehicle assignments throughout the system for equity considerations every three years as part of BART's Title VI Triennial Review for the FTA. Because the planned equitable distribution of rail vehicles will be a benefit to all passengers, there are no impacts anticipated. Therefore, no disproportionately high and adverse effects to Title VI/EJ communities are anticipated.

Phase 2 of Hayward Maintenance Complex (HMC)

HMC Phase 2 was the subject of a separate Categorical Exclusion [**Appendix D**] issued on September 21, 2011 by the FTA. The Negative Declaration **[Appendix A**] and the CE plus addenda **[Appendix B** and **Appendix C**] for HMC are incorporated into this document by reference. HMC was also part of a separate Environmental Justice (EJ) analysis that includes an analysis of the protected communities that could be affected by the HMC. The EJ analysis was submitted to the FTA along with the HMC Initial Study/Mitigated Negative Declaration in 2011. **Appendix N** presents the EJ analysis. Neither Phase 2 of HMC nor the environment affected by HMC Phase 2 have changed since 2011. The project as defined in the EJ Analysis incorporates measures to avoid, minimize, or mitigate adverse effects to the Title VI/EJ communities. For specific details on the measures, please refer to page 21 of **Appendix N**. Because there have been no changes to the project or environment since 2011 and per the EJ Analysis, the project has incorporated measures to avoid, minimize or mitigate adverse effects, there are no remaining impacts anticipated. Therefore, no disproportionately high and adverse effects to Title VI/EJ communities are anticipated.

Communications-Based Train Control (CBTC)

The CBTC equipment in operation will not make any noise, and it will be largely invisible to the public. The CBTC equipment will be entirely in existing transportation right-of-way and existing structures. No impacts from installation or operation of CBTC equipment are anticipated. Therefore, no disproportionately high and adverse effects are anticipated for any surrounding communities, including Title VI/EJ communities.

Traction Power Substations

Demographic Setting

A GIS analysis was performed to review the demographic characteristics of the communities around the five proposed TPSS sites. The affected geographic area by the project includes uses directly adjacent to the TPSS sites. For the purposes of this evaluation, the affected geographic area has been delineated by the Census Block Groups within a half mile buffer of every TPSS.

Two aspects that define EJ communities were analyzed for the census block around the substations:

- Low Income Population: Individuals whose income is at or below 200 percent of the poverty level established for households by the Department of Health and Human Services (HHS) poverty guidelines. This assumption is more inclusive of low-income populations, accounting for higher incomes in the Bay Area as compared to the rest of the United States. The 200 percent threshold is also consistent with the assumptions employed by the MTC in its February 2009 Equity Analysis Report.
- Minority Population: All people except for Non-Hispanic white as defined by the US Census. This includes persons who self-identified themselves as American Indian or Alaskan Native, Black or African American, Native Hawaiian or other Pacific Islander, or Hispanic or Latinos.

To identify Minority and Low Income populations geographically, a percentage threshold based on the total population within the BART four-county service area was determined. Using the 2010 Census data, the percentage of Minority population within the BART systems is 59% and the percentage of Low Income population is 26%. If the Minority or the Low-Income population of the

Census Block Group (community) within the Affected Geographic Area was greater than the BART service area percentage, then the community was identified as a Minority or Low Income Census Block Group.

Table 8 and **Table 9** show a summary of the findings for the Census Block of each proposed TPSS site. Maps and complete tables per substation location and Census Block are presented in **Appendix O**.

Table 8: Low Income Communities near Proposed TPSS

Substations	Total Population[13]	Low Income Population	Percentage of Low Income Population	EJ Low Income Community?
Civic Center	54,187	27,779	52,0%	Yes
Montgomery	42,259	19,044	45,1%	Yes
Oakland 34th Street and I-980	21,943	10,140	46,2%	Yes
Richmond RYE Gap Breaker	21,119	12,508	59,2%	Yes
Concord Minert Road	14,643	2,384	16,3%	No

Table 9: EJ Minority Communities near Proposed TPSS

Substations	Total Population[14]	Minority Population	Percentage of Minority Population	EJ Minority Community?
Civic Center	54,187	35,522	65,6%	Yes
Montgomery	42,259	19,044	64,5%	Yes
Oakland 34th Street and I-980	21,943	14,738	66,0%	Yes
Richmond RYE Gap Breaker	21,119	20,240	95,2%	Yes
Concord Minert Road	14,643	5,959	16,3%	No

Four out of five of the proposed TPSS locations are in Census tracts characterized as Title VI/EJ communities. These four TPSS sites are Civic Center, Montgomery, Oakland 34th Street and I-980 and Richmond RYE Gap Breaker.

Determination of Effects

Traction power substations currently exist at approximately 76 locations throughout the BART System, and are situated proportionally in locations necessary to provide the power distribution necessary to operate the System. Traction power substations cannot be concentrated in one particular portion of the System; they must be distributed throughout the System at regular intervals to be effective and must be placed in areas where low voltage is expected. As substations are distributed across the entirety of the BART System in both Title VI/EJ and non-Title VI/EJ communities, the proposed Transbay Corridor Core Capacity Program improvements do not specifically benefit nor disproportionately impact one community over another.

The planned substations are located on existing BART and Caltrans right-of-way within the current fenced trackway or fenced existing highway right-of-way not accessible to the public, or underground in BART's existing station facilities. Thus, these new substations will not divide any community, affect or alter its character or have the potential to disrupt any community activities.

[13] Total Population in half mile radius around substation

The noise and vibration analysis studies BART performed determined that the new traction power substations would not perceptibly increase existing noise levels along the corridor, and accordingly, no impacts are anticipated. Therefore, no disproportionately high and adverse effects are anticipated for any surrounding communities including Title VI/EJ communities.

Any fences or walls that are erected to obscure traction power substations will be equitable in materials, finishes and style to other similar facilities located in non-EJ communities. No adverse visual impacts are anticipated. Therefore, there are no disproportionately high and adverse visual effects to Title VI/EJ communities.

The projected elements in the CE are within existing transportation right-of-way with systems that are currently operational. Core Capacity project improvements will deliver direct and tangible travel time and reliability and overall mobility benefits to all riders of the system including Title VI/EJ populations that use the BART system.

While 4 out of the 5 proposed TPSS locations are in Title VI/EJ Communities, the analysis above finds that the proposed locations do not disproportionately or adversely impact Title VI/Environmental Justice communities. For any potential impacts that were found, feasible measures were included in the project that would eliminate or reduce the adverse effects to acceptable levels.

Finally, locations for TPSS were determined using objective criteria based on engineering and operational specifications. The distribution of these TPSS facilities adhere to BART's Environmental Justice Policy (2012) which ensures that, "decisions related to vehicle replacement and new investments, or changes in transit facilities, deliver equitable levels of service and benefits to minority and low-income populations." As mentioned above, TPSS are located throughout the entirety of the BART system in both Title VI/EJ and non-Title VI/EJ communities. The TPSS are necessary to keep BART operational which benefits the entire community (including Title VI/EJ communities) at large, and all communities will benefit proportionately from the increased service levels made possible by the project.

Per the FTA Title VI/EJ Circulars, proposed projects should look at the likely adverse effects and benefits, select alternatives, and incorporate measures to address impacts as needed. Due to operational and engineering specifications that prescribe the location of TPSS in a manner that can connect to the BART mainline, there are no feasible alternatives for modifying the locations of TPSS out of a specific community. While there are no alternatives, TPSS facilities do benefit all communities including minority and low-income, and with implementation of the recommended measures, all adverse effects to Title VI/EJ populations have been reduced or minimized to less-than-significant levels.

M. USE OF PUBLIC PARKLAND AND RECREATION AREAS

The Negative Declaration [**Appendix A**] and addenda [**Appendix B** and **Appendix C**] for HMC assessed the potential impacts on public parkland and recreation areas. No impacts are anticipated.

The table below lists the closest parks to the five new substations based on geographic information system and city databases.

Table 10: List of the Closest Parkland or Recreational Area

	Closest parkland or recreational area? (feet)	Name of the Closest Park
Civic Center Station	440	United Nations Plaza
Montgomery Station	350	McKesson Plaza
Oakland 34th Street & I-980	85	Grove Shafter Park
Concord – Minert Road	425	Oak Grove Middle School Playground
Richmond	1075	Lucas Park

The program will not use land from or otherwise affect parks or a recreation areas. Access to parks will be improved in general by more frequent peak hour service. There is no Section 4(f) use or temporary occupancy of public recreation areas.

N. IMPACTS ON WETLANDS

The Negative Declaration [**Appendix A**] and addenda [**Appendix B** and **Appendix C]** for HMC assessed potential impacts on wetlands. The project as defined would not have adverse effects on wetlands.

There are no wetlands in the vicinity of the traction power substation locations. The project would not involve any activities that will discharge dredged or fill material into waters and wetlands. No Section 404 Permit would be required. No adverse effects on wetlands are anticipated.

O. FLOODPLAIN IMPACTS

The Negative Declaration **[Appendix A**] and addenda [**Appendix B** and **Appendix C**] for HMC assessed potential impacts on floodplains. The project as defined would not have adverse effects on floodplains.

For the City and County of San Francisco, the GIS data are not available but the Federal Emergency Management Agency's (FEMA) issued a preliminary flood map. The Downtown San Francisco Civic Center and Montgomery Substations are not located in the 100-years flood plain area designated on the City's interim floodplain map. The project would not place structures in the 100-year flood hazard area that would impede or redirect flood flows[14]. Per FEMA's Flood Insurance Rate Maps, the Concord David Avenue and Minert Road substation is located approximately 75 feet from the 100-year flood plain. **Appendix P** shows the location of the floodplains in relation to proposed TPSS sites. There is no floodplain area in the vicinity of the Richmond RYE Gap breaker substation.

No effects on the flood zone or to the floodplain elevation are anticipated.

P. IMPACTS ON WATER QUALITY, NAVIGABLE WATERWAYS, & COASTAL ZONES

The San Francisco Bay is approximatively 2.5 miles from HMC Phase 2 and half a mile from the closest substation (Downtown San Francisco Montgomery Station). The Negative Declaration [**Appendix A**] for HMC assessed that the project as defined would not have adverse effects. The Downtown San Francisco Montgomery Station TPSS is underground and no effects on the bay are

[14] City and County of San Francisco *San Francisco Floodplain Management Program* Available online: *http://sfgsa.org/san-francisco-floodplain-management-program* [accessed on October 5th, 2016]

anticipated. Except the bay, there are no other water bodies within a half mile radius of HMC or any substation sites.

Construction and areas of soil disturbance may be considered activities that may affect water quality. In case larger excavations are required, the project would avoid releases or discharges into waterways and the storm drain system. Storm water best management practices (as discussed in the Section S *Impacts Caused by Construction* on **page 47**) will be employed during construction as needed.

There would be no construction or operation of facilities that would result in any discharge into navigable waters since construction would not be along navigable waterways. Therefore, no Clean Water Act, Section 401 Certification would be required for the proposed project. No adverse effect on water quality, navigable waterways and coastal zones are anticipated.

Q. IMPACTS ON ECOLOGICALLY-SENSITIVE AREAS AND ENDANGERED SPECIES

The Negative Declaration [**Appendix A**] and addenda for HMC [**Appendix B** and **Appendix C**] assessed potential impacts on biological resources, including habitat, and concluded that the facility would have less than significant impacts.

The TPSS sites are located within the existing BART and Caltrans right-of-way, The two in San Francisco are located underground, while the three located in the East Bay are in transportation and industrial land use and not in or near any ecologically sensitive areas and endangered species, The Richmond and Concord sites feature gravel ballast trackway with sparse and intermittent vegetation, while the Oakland site is located under a freeway ramp structure. the project as defined would not have adverse effects on biological resources.

Endangered & Threatened Species

Information regarding the potential presence of species and critical habitats listed or proposed for listing under the ESA, was obtained from the following sources:

- US Fish and Wildlife Service
- California Natural Diversity Database (CNDDB) of the California Department of Fish and Wildlife.

According to the California Natural Diversity Database (CNDDB)[15] of the California Department of Fish and Wildlife, the following endangered or threatened species have their habitat in the region where the substations will be located.

[15] California Natural Diversity Database, GIS Data

Table 11: List of Endangered or Threatened Species in the Vicinity of the New TPSS Sites

Species	Location	Radius[a]	Status	Effects?	Explanation
Longfin Smelt (fish)	San Francisco	1/2 mile	Federal Listed Candidate, State Listed Threatened	None	No works in waterways
California Black Rail (bird)	San Francisco	1/2 mile	State Listed Threatened	None	Underground work
Beach Layia (plant)	San Francisco	500 feet	Federal and State Listed Endangered	None	No works executed on beaches
Alameda Whipsnake (snake)	Richmond & Concord	500 feet	Federal and State listed Threatened	None	Poor quality habitat

Maps of the CNDDB with the location of these species habitat are provided in **Appendix P.**

The Longfin Smelt (*Spirinchus thaleichthys*) is a fish. Construction and operation would avoid discharges into waterways and thus, no effects are anticipated.

The California Black Rail (*Laterallus jamaicensis coturniculus*) is a bird. Since work in the San Francisco area will be underground, there would be no effect.

The Beach Layia (*Layia carnosa*) is a plant occuring in beach area in San Francisco. Since no work will take place on beaches and all work will be underground or on existing sidewalks, no effects are anticipated.

Alameda Whipsnake (*Masticophis lateralis euryxanthus*) may occur in grasslands and open woodlands. The Richmond and Concord TPSS site are railroad right-of-way consisting of gravel ballast trackway, with intermittent sparse vegetation. Since the sites are not grasslands or open woodlands, no effects are anticipated.

Under Section 7, Federal agencies must consult with the U.S. Fish and Wildlife Service (Service) when any agency action may potentially affect a listed endangered or threatened species. Since no effects on endangered or threatened species are anticipated, no Section 7 consultation was deemed necessary. No permits from the Army Corps, the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service are required.

Mature Tree Removal

The Civic Center and Montgomery substations in San Francisco are located entirely underground and there are no trees in the existing facilities. There are no trees at the Richmond RYE Gap Breaker TPSS site. Therefore, no tree removal is planned on those sites and no trees would be affected.

Tree removal may occur for installation of the *Concord - David Avenue and Minert Road* TPSS and the *Oakland south of 34th Street in the I-980 right-of-way* TPSS. The number of trees to be removed will be determined later in the design phase. Any future removal would be performed outside the nesting season as part of the best practices. If tree removal is needed, the tree(s) would be replaced at a 1:1 ratio outside BART's operating envelope. Therefore, no adverse effects are anticipated.
No trees will be affected on the HMC Phase 2 site.

R. IMPACTS ON SAFETY AND SECURITY

General Safety

The project would comply with seismic safety standards per BART Facilities Standards. The general design policy of BART Facilities Standards Structural Criteria for Seismic Design incorporates the relevant seismic safety provisions of the California Building Code (CBC) and the California Department of Transportation Bridge Design Specifications (CBDS) along with other professional industry standards. BART Design Criteria require that all operating facilities be designed to withstand the effects of the Maximum Credible Earthquake without significant degradation of structural integrity.

The project would comply with security procedures per BART Facilities Standards, both during construction and operation. Work would be coordinated with BART Police and a security plan would be developed for the project. No effects on general safety and security are anticipated.

Downtown San Francisco Civic Center Substation

The construction of the Downtown San Francisco Civic Center substation requires the permanent closure of two passenger entrances/exits to the station. Six entrances/exits will still be in operation. The remaining entrances/exits will satisfy the requirements of NFPA 130[16] [**Appendix H**].

In the event of a failure, substation equipment may catch fire, introducing a safety risk at the concourse level. Ventilation will remove smoke from the underground station. A permanent fire rated barrier will be built as a part of the project. Therefore, no effects are anticipated.

Downtown San Francisco Montgomery Substation

The location of this substation is directly in the middle of Montgomery Station in BART's paid area, with a secondary location in the free area adjacent to an SFMTA stairway. The location is in an area with minimal foot traffic, within BART's paid area and next to MUNI's paid area. Redefining the perimeter and paid area barriers will be necessary and structural improvements may be necessary to support a new substation. Therefore, no effects are anticipated.

As with the Civic Center substation, in the event of a failure, substation equipment may catch fire introducing a safety risk at the concourse level. Ventilation will remove smoke from the station. A permanent fire rated barrier will be built as a part of the project. Therefore, no effects are anticipated.

Substation near public access

Substations would need to be fenced to prevent people from being in contact with electrical equipment. Substations in Richmond (RYE Gap Breaker Conversion), Concord (David Avenue and Minert Road) and Oakland (34th Street and I-980) will be fenced and signage will warn people of the danger, as with all current BART substations. Therefore, no effects are anticipated.

S. IMPACTS CAUSED BY CONSTRUCTION

The Final Negative Declaration [**Appendix A**] and addenda for HMC [**Appendix B** and **Appendix C**] assessed the impacts caused by construction and concluded that the project as defined would not have adverse effects during construction.

The potential construction impacts of the five new TPSS are discussed below.

[16] NFPA 130: Standard for Fixed Guideway Transit and Passenger Rail Systems, National Fire Protection Association, Edition 2014

Construction Schedule[17]

Construction of HMC Phase 2 would commence approximately in Winter 2019 and would be separated in two key elements: the storage yard and the flyover. The construction of the storage yard would take approximately 24 months. The storage yard would be constructed simultaneously with the flyover that is projected to be built in approximately 35 months.

Installation of the new TPSS is expected to begin in the Fall of 2019. The projected span of construction activities for a TPSS is 10 months for each location in downtown San Francisco. A period of eight months per substation is anticipated for the East Bay substations located in Oakland, Richmond and Concord.

Installation of CBTC would consist of installation of new racks, servers, computers, communication equipment and cable trays within the existing wayside train control rooms and central control facilities. The activities would also include trenching for new cabling, concrete pads for electronic equipment and radio antennas along the trackway. A majority of the activities would involve testing the new system and associated software engineering. All of these associated activities will take place within existing BART right-of-way and existing facilities. BART anticipates that the installation would be occur in eight phases, with each of the phases focusing on a specific part of the BART system. Phases would start in 2019 and end in 2028.

Traffic management plan

For the downtown San Francisco TPSS locations, temporary partial street closures could be needed for the delivery and installation of the equipment. Depending on the station, an existing skylight or the existing BART entrance may be used to deliver the equipment to the underground level. Temporary sidewalk closures may be necessary. For the delivery through a passenger station entrance, the entrances will need to be closed to the public during the construction. Delivery of the largest equipment is expected to require a street level crane setup, with work performed during off hours, and with active traffic management to avoid adverse impacts.

During construction and installation, there may be occasional impacts to BART service and MUNI service. Since new raceways and conduits will need to be routed to connect the new substation to the existing contact rail system at track level, this work will need to occur during BART and MUNI non-operational hours. Access and work protections from train movement and electrification will need to be implemented.

Adequate space must be maintained during construction on the sidewalk and street. Work will need to occur during non-peak hours to minimize any impacts to automobile and pedestrian traffic. Community outreach efforts are also recommended for addressing any potential concerns from affected local businesses[18].

Stormwater Pollution Prevention

BART will obtain coverage under a NPDES General Permit for stormwater, the BART District shall require the contractor to implement control measures consistent with the General Permit and recommendation and policies of the RWQCB – including submittal of a Notice of Intent with site map, developing a Storm Water Pollution Prevention Plan (SWPPP), and implementing BMPs

[17] Construction schedule is at a preliminary stage and could change

[18] PGH Wong, *Draft Core Capacity Traction Power Equipment Constructability Review Downtown San Francisco, May 8, 2016* **[Appendix F]**

Air Quality

The major emission sources during construction are emissions from diesel-fueled construction equipment, dust generated by mechanical disturbance, and windblown dust from exposed soil. The proposed project would generate a limited amount of dust and other air pollutant emissions as construction will consist primarily of minor grading, the construction of concrete slabs, and the delivery and setting of equipment by use of a crane. The locations in Oakland, Richmond, and Concord have more potential for dust as the locations may have some exposed soil. The construction area for the San Francisco locations will be made up of street and sidewalks.

The Bay Area Air Quality Management District (BAAQMD) provides some screening criteria in their Air Quality Guidelines (May 2010). These criteria are to help determine whether a proposed project would result in potentially significant air quality impacts. The screening level for general light industry is 259,000 square feet. It is estimated that construction would occur over approximately 45,000 square feet (total for all 5 locations), well below the construction-related screening sizes used in the Air Quality Guidelines.

The BAAQMD recommends the implementation of the measures listed below irrespective of any potential of construction-related emissions exceeding applicable thresholds of significance. Project specifications will incorporate these measures as applicable and the construction contractor will be required to implement them. The construction manager will oversee and monitor the contractor's compliance with construction measures, rules, and regulations.

Basic Construction Measures Recommended for All Proposed Projects[19]

- All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
- All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
- All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
- All vehicle speeds on unpaved roads shall be limited to 15 mph.
- All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.
- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.
- All construction equipment shall be maintained and properly tuned in accordance with manufacturer’s specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.
- Post a publicly visible sign with the telephone number and person to contact at the Lead Agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The BAAQMD’s phone number shall also be visible to ensure compliance with applicable regulations.

Construction greenhouse gas (GHG) emissions include emissions produced by onsite construction equipment and emissions arising from traffic delays due to construction. These emissions will be produced at different levels throughout the construction phase. The measures listed above will also help reduce construction equipment GHG emissions. The frequency and occurrence of traffic related GHG emissions can be reduced by implementing better traffic management during construction phases.

[19] *BAAQMD, Air Quality Guidelines, 2010*

BART will implement the BAAQMD recommended measures as listed above. No impacts are anticipated.

Noise and Vibration

Temporarily elevated noise and vibration levels could result from construction activities associated with re-working and constructing new TPSS[20]. These activities may include demolition, grading, minor excavation, foundation fabrication, paving and installation of system components. The increased levels may occur in residential areas and at other noise-sensitive land uses located within 200 feet of the construction activity. No very high noise and vibration producing activity such as pile driving is anticipated to be necessary for elements of this program. Construction at each TPSS location will be for a limited amount of time. While construction noise and perhaps vibration levels will be briefly elevated, they will not be substantial and will not create impacts if best management practices are followed.

The following good practice measures will be applied by contract specifications to construction as appropriate to minimize temporary construction noise and vibration:

- All equipment powered by internal combustion engines shall be equipped with effective mufflers and silencers in good repair.
- All compressed air and hydraulically driven equipment shall be equipped with the manufacturer's "quiet package" if available.
- Avoid nighttime construction affecting residential neighborhoods.
- Locate stationary construction equipment as far as possible from noise-sensitive use.
- Construct temporary noise barriers, such as temporary walls or noise curtains between noise-sensitive receivers and any very noisy activities requiring an extended duration.
- Route construction-related truck traffic to roadways that will cause the least disturbance to nearby residents.
- Use alternative construction methods if necessary to minimize the use of impact and high vibration equipment (e.g., vibratory compactors) near sensitive land use.

BART will implement the best practices measures listed above. No impacts are anticipated.

Construction Management Best Practice

Best construction and management practices would be evaluated during the final design phase and could include but not limit to:

- Construction Phasing and Traffic Management Plan
- Construction Phasing to Reduce Air Emissions
- Dust Control during Construction
- Construction-Related Greenhouse Gas Best Management Practices
- Identify construction activities that, due to concerns regarding traffic safety or congestion, must take place during off-peak hours
- Conduct a Health and Safety Risk Assessment prior to any construction activity
- Develop a site-specific Health and Safety Plan

BART will implement the best practices measures listed above. No impacts are anticipated.

[20] *Noise and Vibration Technical Report* [**Appendix I**], October 2016, p 37.

T. SUPPORTING TECHNICAL STUDIES OR MEMORANDA

On November 17, 2016, the BART Board adopted the Transbay Corridor Core Capacity Project with a finding that the 306 additional vehicles, communications based train control, and five new traction power substations are statutorily exempt from the California Environmental Quality Act (CEQA) in accordance with the Public Resources Code, Section 21080(b)(10) [**Appendix J**].

U. PUBLIC OUTREACH AND AGENCY COORDINATION

BART has coordinated with Caltrans regarding the TPSS proposed for installation in the I-980 right-of-way south of 34th Street in Oakland. Caltrans staff did not identify any issues, and the process for securing a cooperative agreement has been initiated.

BART is coordinating with the City and County of San Francisco relative to the closure of the Civic Center station entrances and the number, location, size, and design of the TPSS vent grates along Market Street. The letter [**Appendix G]Error! Reference source not found.** documents the City's support for the project.

BART has coordinated with the MTC's Air Quality Conformity Task Force on the analysis process for an air quality conformity finding for the acquisition of additional vehicles.

The new BART vehicles, traction power enhancements, and the CBTC system are described on the BART website at: https://www.bart.gov/about/projects and https://www.bart.gov/sites/default/files/better-bart/BetterBART_Brochure_0.pdf

The action described above meets the criteria for a NEPA categorical exclusion (CE) in accordance with 23 CFR Part 771.118 (subsections (c)(1) (power substations and other discrete utilities within or adjacent to existing right of way), (c)(5) (installation and improvement of safety and communication equipment within or adjacent to existing right of way), (c)(7)(acquisition of rail cars that can be accommodated by existing facilities or by new facilities that qualify for categorical exclusion) and (c)(12) (projects within existing operational right of way including transit power substations and transit venting structures).

Oct. 12, 2017

Applicant's Environmental Reviewer **Date**

REFERENCE

The list of CEs in 23 CFR 771.118 focuses on actions most applicable to FTA. It is FTA's responsibility to determine whether the action described by the grant applicant ("applicant") falls within the CE category (i.e., the action meets all conditions listed in the CE), whether the action is inappropriately segmented from a larger project, and whether there are unusual circumstances that would make a CE determination inappropriate).

Grant applicants should include sufficient information for FTA to make a CE determination. A description of the project in the grant application, as well as any maps or figures typically included with the application or as requested by the FTA Regional Office, should be submitted to FTA to determine whether the CE applies.

Given the nature of the CEs listed under section 771.118(c), documentation demonstrating compliance with environmental requirements other than NEPA, such as Section 106 of the National Historic Preservation Act ("Section 106"), or Section 7 of the Endangered Species Act, may be necessary for the processing of the grant. That supporting documentation can be included in TEAM (preferred) or kept in the FTA Regional Office's project files. Other applicable environmental requirements must be met regardless of the

applicability of the CE under NEPA, but compliance with other environmental requirements does not elevate an action that otherwise is categorically excluded under section 771.118(c) to section 771.118(d).

Pursuant to 40 C.F.R. § 1506.5, applicants or applicants' contractors may prepare NEPA documents for submittal to federal agencies. However, the applicant is responsible for submitting accurate and complete documentation to FTA. The applicant should prepare a separate transmittal letter or statement to accompany the CE verifying that they have reviewed the information contained in the document when they transmit it to FTA. The transmittal should include the following statement:

> *"in submitting the Transbay Corridor Core Capacity Program categorical exclusion (CE) to the FTA, the applicant, the Bay Area Rapid Transit, affirms that it has reviewed and supports the information presented documenting the proposed action as meeting the criteria for a CE in accordance with 23 CFR Part 771.118 (d). Following independent review and verification by FTA, applicant requests that it be notified of the acceptability of its submission"*

U.S. Department
of Transportation
**Federal Transit
Administration**

REGION IX
Arizona, California,
Hawaii, Nevada, Guam
American Samoa,
Northern Mariana Islands

90 7th Street
Suite 15-300
San Francisco, CA 9411036701
415-734-9490

JUN 20 2019

Ms. Grace Crunican
General Manager
Bay Area Rapid Transit District
300 Lakeside Drive
P.O. Box 12688
Oakland, CA 94604-2688

Re: Approval to Enter Engineering: Transbay Corridor Core Capacity Project

Dear Ms. Crunican:

The Federal Transit Administration (FTA) is pleased to inform you that the Bay Area Rapid Transit District's (BART) request for the Transbay Corridor Core Capacity Project (the Project) to enter the Core Capacity Engineering phase of the Capital Investment Grants Program (CIG) is approved. This approval to initiate Engineering is a requirement of Federal transit laws governing the Program (49 U.S.C. 5309(g)).

FTA is required by law to evaluate proposed projects against a number of criteria and ensure that prospective grant recipients demonstrate the technical, legal, and financial capability to implement the project. As a result of FTA's evaluation of the Project, an overall project rating of *High* was assigned.

Please note that BART undertakes Engineering work at its own risk, and that the Project must still progress through further steps in the CIG program to be eligible for considerations to receive CIG funding.

With this Engineering approval, BART has automatic pre-award authority to incur costs for Engineering activities, demolition, and other non-construction activities such as the procurement of rails, ties, commodities, and other specialized equipment. BART should consult with the FTA Region IX office for a determination of whether any other non-construction activity falls within the automatic pre-award authority granted with Engineering approval.

In addition, BART has automatic pre-award authority to procure vehicles, acquire real property, and perform utility relocation for all project components that have been cleared under the September 14, 2017 Categorical Exclusion and are not subject to additional NEPA review.

FTA reminds BART that the procurement of vehicles must comply with all Federal requirements including, but not limited to, third-party procurement requirements, the Americans with Disabilities Act, and Buy America Act.

This pre-award authority does not constitute any FTA commitment that future Federal funds will be approved for the Project or for any element of the Project. As with all pre-award authority, all Federal requirements must be met prior to incurring costs in order to retain eligibility for future FTA grant assistance. This approval also does not constitute approval to start any physical construction activities other than those highlighted above, without the issuance of a Letter of No Prejudice. Additional guidance regarding pre-award authority for the Capital Investment Grants Program is provided in the FTA Fiscal Year 2018 Apportionments, Allocations, and Program Information Notice, that was published in the Federal Register Notice on July 16, 2018.

Local Financial Commitment

The capital cost of the Project submitted by BART in September 2018 was $2,771,169,595 in year-of-expenditure (YOE) dollars, with an assumed $1,250,000,000 (45.1 percent) in Section 5309 Capital Investment Grants (CIG) funds. FTA determined that approximately 79 percent of the non-Section 5309 capital funds were committed. Subsequent to receipt of that information, FTA discussed an accelerated CIG payout schedule with BART, including an allocation of $300 million in FY2018 CIG funds. BART indicated this accelerated payout schedule would eliminate $81.49 million in financing charges expected to be incurred and, therefore, reduce the total project cost to $2.690 billion and the CIG share to $1.169 billion (43 percent).

Please be advised that the amount of Core Capacity funding for the Project is fixed at the time of entry into Engineering. Therefore, consistent with BART's statements that an accelerated CIG payout schedule would reduce the project cost and the CIG share, $1.169 billion represents the maximum amount of Core Capacity funds that will be provided by FTA for the Project should an FFGA be approved.

Prior to the Project's consideration for a Full Funding Grant Agreement (FFGA), BART must submit a revised financial plan reflecting the lower project cost and accelerated CIG payout schedule. Additionally, BART must secure and document the commitments of all non-CIG funding for the Project and provide a more specific plan on how it intends to address long-term State of Good Repair needs.

Scope, Schedule, Cost, and Technical Capacity

FTA has determined that BART has the technical capacity and capability to effectively manage the Engineering phase of the Project. However, during Engineering, BART must address all recommendations noted in FTA's *Readiness to Enter Engineering Review Report*, which represent risks to the Project cost and schedule, including the key items listed below:

- Execute remaining critical third party agreements, mainly the Cooperative Agreement with Caltrans for Traction Power Substations (TPSS), the Coordination Agreement with

the City of Hayward for construction at the Hayward Maintenance Complex, and the City and County of San Francisco for TPSS.

- Maintain risk registers throughout the project lifecycle.
- Provide detailed schedules in native format for each project element one month before the FTA risk refresh workshop.
- Establish a centralized project-wide contract/document management system.
- Establish proactive bottom-up cost forecasting in the contract/document management system.
- Establish risk-based contingency and cost forecasting.
- Develop a resource loaded schedule for the Project.
- Obtain additional staff for the Project Manager in the area of Project Controls soon after entry to Engineering.

Civil Rights

Pursuant to the Civil Rights Act of 1964 and its implementing regulations, including FTA Circular 4702.1 (Title VI Program Guidelines for FTA Recipients, Part II, Section 114), BART submitted a Title VI program on January 31, 2017. This submission was approved by FTA on October 4, 2017. The current program approval remains valid through March 31, 2020.

BART's Equal Employment Opportunity (EEO) Plan was approved on February 27, 2013, and expires on April 30, 2020. BART must submit the required EEO program update at least 60 calendar days before the current approval expires.

BART's Disadvantaged Business Enterprise (DBE) program was submitted on March 21, 2017, and is currently under review. BART's required triennial DBE program goal was submitted on October 22, 2016, and approved by FTA on October 24, 2016. The agency's goal remains valid through September 30, 2019.

BART is required to ensure that the vehicles, stations, and facilities are designed and engineered to ensure compliance with current standards for accessibility under U.S. Department of Transportation regulations implementing the transportation provisions of the Americans with Disabilities Act of 1990 (ADA). BART is advised to independently verify manufacturers' claims of ADA compliance, and to consult with FTA's Office of Civil Rights concerning ADA requirements as project construction and implementation progresses.

Before and After Study

Within four months of entry into Engineering, BART should complete the milestone activities required for the Before-and-After Study of the Project, namely the documentation, analysis, and archiving of the predicted physical scope, capital cost, transit service levels, operating and maintenance costs, and ridership. BART should coordinate this work, as it is underway, with the FTA Office of Planning and Environment.

FTA looks forward to working with BART on the Transbay Corridor Core Capacity Project. If you have any questions, please call Ted Matley, Director of Planning and Program Development at (415) 734-9468.

Sincerely,

Ray Tellis
Regional Administrator