



Ridership Restoration Grant

November 2021





SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT
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2021

November 15, 2021

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The Honorable Nuria Fernandez
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 US Department of Transportation
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RE: FY2021 American Rescue Plan Route Planning Restoration Program Discretionary Grant Application

Dear Administrator Fernandez,

The San Francisco Bay Area Rapid Transit District (BART) respectfully submits a request for \$1 million in Route Planning Restoration Program funds from the American Rescue Plan (ARP) Act. The funds would support essential areas of our Ridership Restoration planning efforts focused on improving equity for underserved populations.

With Route Planning Restoration Program funding, BART will identify three stations used by individuals living in disadvantaged neighborhoods to better understand the travel needs of low-income and traditionally underserved communities; including trip origins, destinations, and transfers. Additionally, BART will evaluate service responsiveness to target population needs by defining means to facilitate end-to-end journeys in the context of the regional transit network, including:

- Integration with connecting transit systems
- Improved access and information for transit dependent populations, non-English speakers, and people with disabilities
- Consistent station access signage and wayfinding
- Robust passenger information systems that make journeys clear and efficient while reducing overall travel time

This assessment will collect data, evaluate transit service transfer quality and recommend equitable improvements to enhance service quality and reduce travel times for underserved populations neighboring our three identified stations.

BART is grateful for the FTA’s support throughout the COVID-19 pandemic and remains committed to our mission of providing safe, reliable, clean, quality transit service for all our riders. We appreciate your consideration of this grant application.

Sincerely,

Robert M. Powers
 General Manager



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I. PROJECT OVERVIEW

1. About BART

The San Francisco Bay Area Rapid Transit District (BART) is a heavy-rail public transit system that connects the San Francisco Peninsula with communities in the East Bay and South Bay. BART service currently extends as far as Millbrae, San Francisco International Airport, Richmond, Antioch, Dublin/Pleasanton, and Berryessa/North San José. BART operates in five counties (San Francisco, San Mateo, Alameda, Contra Costa, and Santa Clara) with 131 route-miles of track and 50 stations, carrying approximately 405,000 trips on an average weekday (prior to the COVID-19 pandemic).

For more than 45 years BART has provided fast, reliable transportation to downtown offices, shopping centers, airports, tourist attractions, entertainment venues, universities and other destinations for Bay Area residents and visitors alike.

BART is a special purpose transit district that was formed in 1957 and opened for service in 1972. [Read more about BART's history and system facts.](#)

BART's vision is to support a sustainable and prosperous Bay Area by connecting communities with seamless mobility.

BART's mission is to provide safe, reliable, clean, quality transit service for riders.

2. Project Description

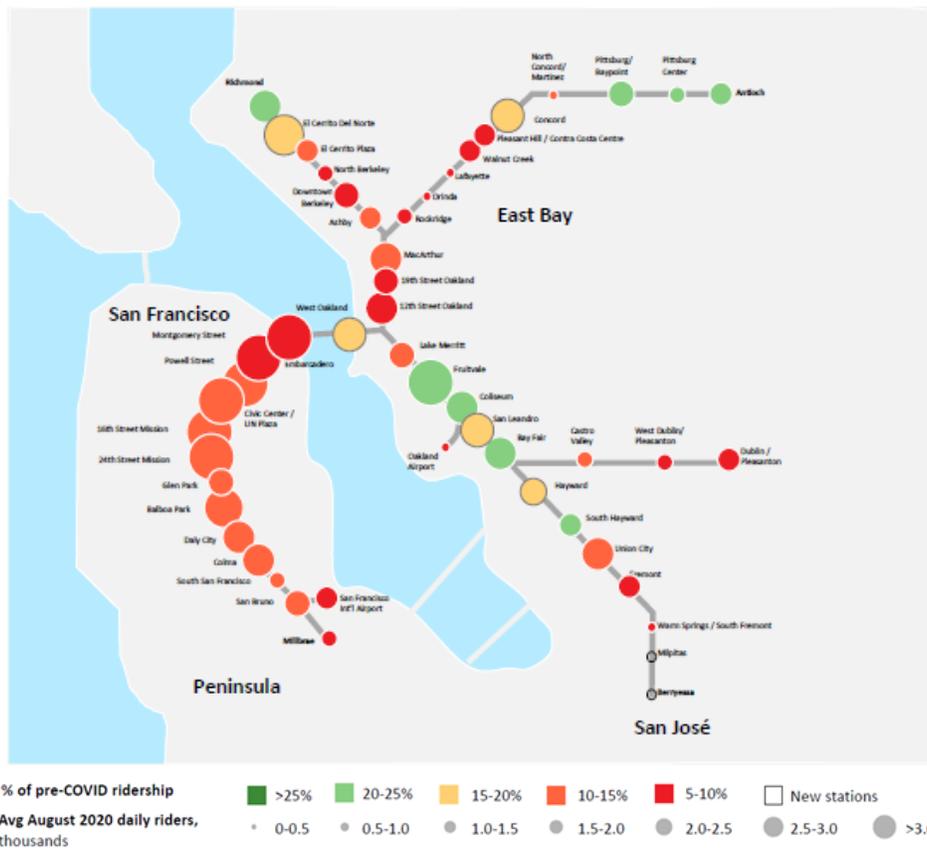
BART is submitting this application to the Federal Transit Administration (FTA) for \$1 million in fiscal year (FY) 2021 American Rescue Plan (ARP) Restoration Route Planning funds to support BART's Ridership Restoration Project.

Identify Needs

For nearly five decades, BART's largest and most robust ridership cohort has been people working in central urban business districts, commuting to and from their employment during weekday morning and evening peak-periods. This market was drastically reduced by the COVID-19 pandemic, as most of these commuters were able to work remotely and minimize the risk of viral exposure at work and on transit. While peak-period commute ridership has recently begun to return, BART's principal market has clearly shifted. We hypothesize that the predominant cohort of BART's current home-to-work ridership are people employed in jobs that have been essential during the pandemic, as well as those in occupations that can only be performed in person, on site. Typically, a higher proportion of these riders are dependent on public transit, and their travel patterns are not aligned to the typical office workday. These passengers ride earlier and later in the day, and commute seven days per week rather than just on weekdays.

Identify focus stations and needs of equity populations at these stations. Understanding the size, demographics, employment, and travel behavior of BART’s entire market involves numerous sources and methods. Some general conclusions can be drawn by identifying the travel patterns during the COVID-19 pandemic in comparison with BART’s pre-pandemic “normal” market. Figure 1 illustrates the distribution of weekday ridership by station during August 2020, as compared to pre-pandemic ridership. This comparison shows that, while ridership associated with every station in the network was profoundly reduced, the impact varied by station.

Figure 1. BART Average Weekday Exits and Entries by Station, August 2020
Weekday



The stations with the most robust continuing weekday ridership were Fruitvale, Coliseum, Bay Fair, South Hayward, Pittsburg/Bay Point, Pittsburg Center, Antioch, and Richmond.

Similar effects can be observed for weekend ridership during the same period, illustrated by Figure 2, which shows that the stations with the most robust continuing weekend ridership were Fruitvale, Bay Fair, Concord, Pittsburg/Bay Point, Pittsburg Center, Antioch, and Richmond.

Figure 2. BART Average Weekend Exits and Entries by Station, August 2020
Weekend

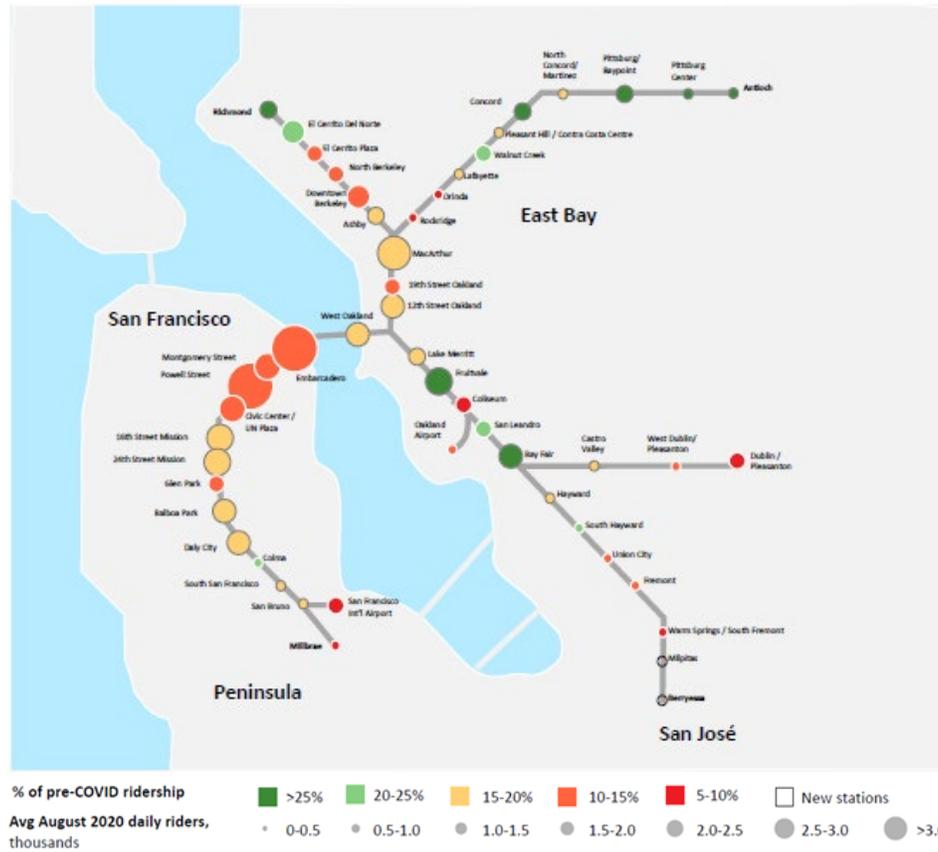
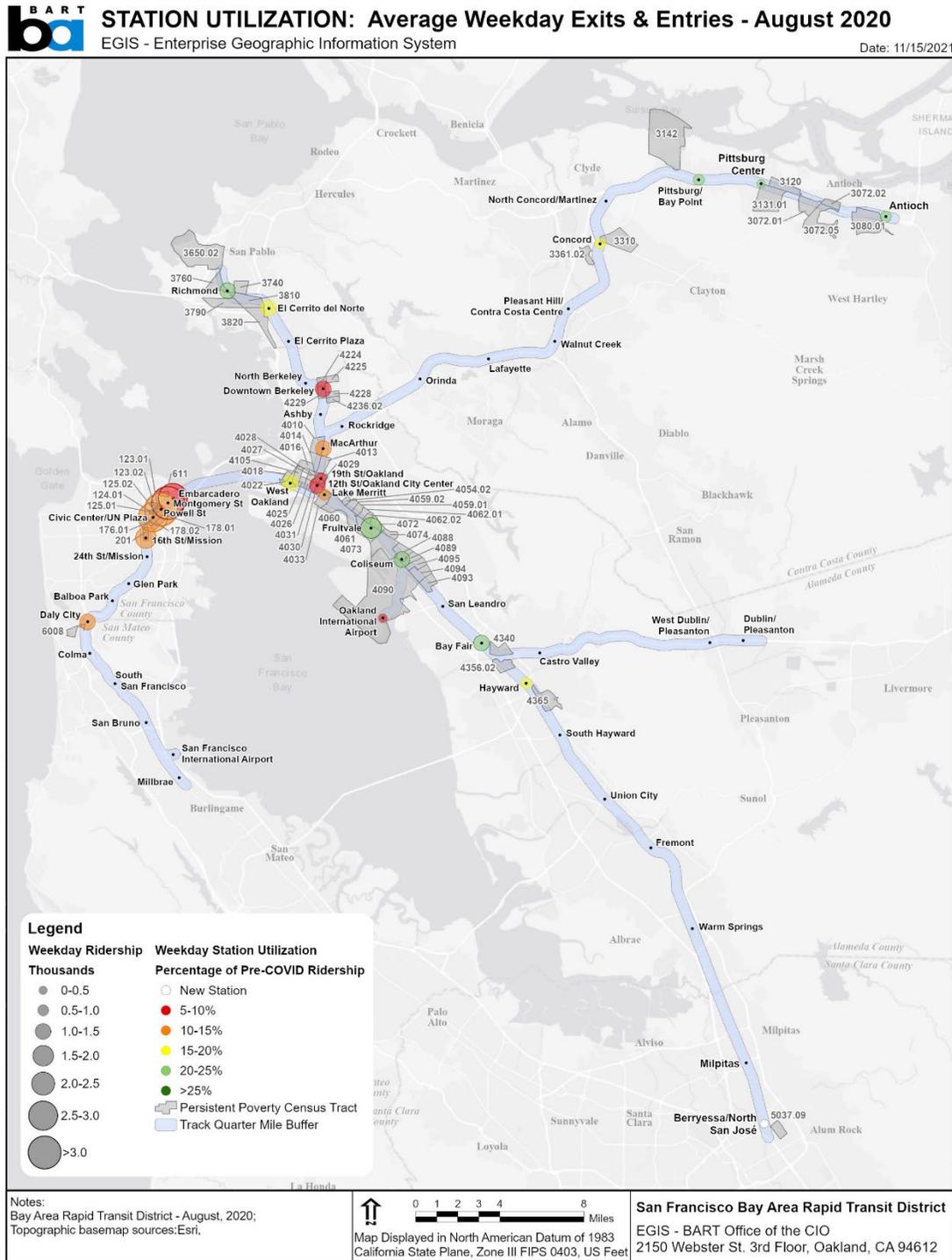


Figure 3 corroborates our inferences from the preceding figures, illustrating the correlation of Persistent Poverty Tracts with stations serving continuing BART ridership through the pandemic. In this diagram average weekday ridership percentage is only shown for stations that overlap or are adjacent to Persistent Poverty areas.

Figure 3. Persistent Poverty Tracts Within a Quarter Mile of BART Track Centerline



Source: Bay Area Rapid Transit District; Office of the Chief Information Officer, July 2021

These comparisons do not however depict the overall travel demand for the areas served by these stations, including similar people who travel via other modes. They only suggest common characteristics of riders that have continued to ride BART during the pandemic. While it has

always served transit-dependent riders, BART services have been conceived, designed, and delivered to optimally serve a commute market. The pandemic, however, has highlighted our responsibility to a broader and more diverse population and our need to respond to evolving Bay Area travel patterns and needs. As a critical first step, BART must better understand the needs of those transit-dependent riders that have continued to ride BART during the pandemic, and that we hypothesize, based on station catchment demographics, are low-income riders from traditionally disenfranchised communities. To this end, BART proposes to:

1. Update data on BART ridership patterns for priority communities and identify data and processes to select focus stations.
2. Select three focus stations for further study and improvement based on COVID-19 ridership trends, priority populations and equity. Special attention will be paid to the catchment areas around the stations and to identifying stations that are geographically diverse. Ideally, the chosen stations will reflect the broad region BART serves.
3. Define and undertake a co-creative process at the three stations to better understand travel patterns and needs. Co-creation is a community engagement process designed to overcome limitations to traditional engagement processes by partnering directly with community-based organizations to host flexible, accessible, and interactive community workshops with impacted community members. Key to co-creation is compensation for the CBOs for their work to recruit members of their communities and compensation for community members who share their lived experiences, closing a critical gap in information and data. A subsequent survey of riders at the three focus stations may also support this effort by providing quantitative data.
4. BART will develop ridership profiles, informed by the co-creative process, and survey data as relevant, for selected stations to characterize their transit dependence and travel behavior, including their station access modes and reasons these riders have continued to use BART. These profiles will inform where service and access to/through these stations may be improved, to provide more convenient, comfortable, and responsive travel options to a broader population.

Deliverables:

- Memo summarizing identified need, including:
 - Ridership patterns, data sources and methodology supporting the selection of three focus stations that illustrate new ridership patterns
 - Summary of the co-creative process and outcomes, including summary of feedback
 - Survey data and findings (as relevant)
 - Ridership profiles

Evaluate BART Service

While BART has historically aimed to provide services of uniform quality to its entire service area, several factors have caused its service to favor particular markets and travelers. BART's original purpose was to mitigate the congestion and pollution caused by burgeoning automobile traffic on Bay Area highways and bridges. This goal inherently biased BART's design and performance criteria toward people already traveling, or likely to travel by personal automobiles. The innate focus of BART service was therefore the weekday peak commute market, traveling between suburban communities and urban centers. Subsequently, as the Bay Area has experienced consistent economic growth, BART services have evolved in response to that principal commute market, while other travel purposes and cohorts have been peripheral.

While travel outside of the peak period may not always get the most attention, in 2019 BART began operating 'Early Bird Express' services. This is a network of express bus routes that serve primarily service workers traveling to jobs before BART rail service opens at 5:00 am. During the pandemic, the Early Bird Express service saw a 75% reduction in daily service. Those trips that were operated retained some ridership, but the restoration or modification of this service could be a potential solution depending on the outcomes of this evaluation.

Using the three focus stations identified in the first phase, BART will evaluate the quality of service provided with a particular emphasis on data and rider feedback collected in the first task. Quality of service may be characterized by such measures as origin-destination travel time, hours of service, transfer times, crowding on trains and in stations, station wait times, availability of single-seat rides, signage and wayfinding, connectivity with other transit services, amenities, passenger information systems, or other topic areas identified in the rider co-creative process and survey. These measures may be addressed via adjustments to train schedules or BART sponsored bus service, the content and format of passenger information, and integration with other transit operators. The goal of this step is to define consistent characteristics and measures of quality service, and steps by which BART may improve service to its most robust and dependent ridership cohorts – broadening and deepening BART's commitment to all its riders.

BART proposes to evaluate service responsiveness to target population needs by:

1. Comparing identified needs with current service provision
2. Evaluating service patterns and frequencies to balance the needs and priorities of essential workers, service workers, and discretionary riders with those of peak commuters.
3. Recommending improvements to reduce travel time and/or improve the quality or frequency of service for target populations.

Deliverables:

- Memo summarizing service provision options and recommendations.

Evaluate Transit Service Connectivity

To better support end-to-end journeys in the context of the regional transit network, BART aims to improve integration with connecting transit systems; increase access for persons with



disabilities; refine signage and wayfinding; enhance the efficacy of passenger information systems in making journeys clear and efficient and reduce overall travel time.

The Bay Area regional transit network consists of 27 transit agencies. As BART is a regional trunk service, our riders’ trips typically do not begin or end at our stations. Improving access to stations and transfers between BART and connecting transit services can reduce overall travel time, expand opportunities, and improve user experience. This is especially true for our priority equity populations that may not be able use a car to access stations. BART has a robust program to support and improve access to stations, including a board approved Station Access Policy, Transit Oriented Development program, and guidelines for curb use allocation.

As shown in Table 1, between August 2019 and August 2021, ridership accessing BART by transferring to/from another transit service dropped significantly less than those accessing BART by driving and parking, and less than overall BART ridership. Transit transfers at the stations highlighted above also dropped less than for the overall BART system. At these stations, a greater proportion of our continued ridership used transit to get to the station in 2021 than in 2019. For end-to-end journeys therefore, improving transfer time and transfer experience supports key segments of ridership at these stations. Antioch, which draws ridership from a large commuted-reached reaching to California’s Central Valley, is the only station where parking validations dropped proportionally compared to ridership and only slightly more than transit transfers.

Table 1. Comparison of BART Access Mode and Ridership – Weekdays August 2021 as a percentage of August 2019

	Total Entries/Exits	Parking Validations	Transit Transfers (to/from BART)
BART System	24%	11%	32%
Antioch	40%	41%	49%
Bay Fair	33%	11%	60%
Coliseum	41%	10%	57%
Concord	29%	12%	55%
Fruitvale	37%	14%	39%
Pittsburg Center	33%	6%	53%
Pittsburg/ Bay Point	33%	19%	74%
Richmond	36%	10%	50%
South Hayward	30%	13%	52%

Source: Bay Area Rapid Transit District Parking Validation and Entry/Exit Data Aug 2019, Aug 2021; Metropolitan Transportation Commission Clipper Transfer Data Aug 2019, Aug 2021.

During the pandemic, the Blue-Ribbon Transit Recovery Task Force of the Metropolitan Transportation Commission (MTC), consisting of elected officials, transit operator general managers, advocates, and other stakeholders, was convened to identify ways to support recovery of transit ridership post-pandemic. Transfer experience between transit operators was identified as a specific gap, exacerbated by pandemic related service reductions and fluctuations. Coordination amongst MTC and transit agency staff identified multiple aspects of transfer experience that could be improved including coordination of route schedules, aligning the timing





of schedule changes, navigation into and through stations and to connecting services. Specific solutions to these are included below as options for each station improvement plan.

In this task, informed by the outreach and co-creation process at the selected focus stations, BART will collect data, evaluate the quality of transfers to connecting transit, and provide recommendations to improve transfer quality and reduce overall travel times, by enhancing access, navigation, and passenger information to and through stations, and transfers between BART and connecting transit services. This task will focus on two efforts:

1. Pilot Smart Station Transfer Design:
 - a. Collect data and develop detailed General Transit Feed Specifications (GTFS) Pathways files for each of the identified stations. This will enable the BART Trip Planner and third-party navigation apps, such as Google Maps, to guide passengers through complex stations, such as between train platforms and to connecting transportation, supporting shortest distance/time walking routes, and the back-end data to support passenger route preferences such as using elevators and escalators. This will provide a significant benefit for people with disabilities, non-English speakers, and first-time or occasional transit users and those exploring new routes.
 - b. Undertake a detailed multi-modal connectivity analysis. This will be completed in collaboration with MTC to leverage their Transit Transfer Analysis Tool to support the needs of transferring ridership at the three focus stations, utilize the Pathways work to improve the accuracy of walk times to support schedule alignment with connecting transit; and identify gaps and advance data-backed improvements to service and transfer coordination. BART will seek to optimize transfer trips between transit agencies with enhanced analytic tools to recommend service improvements that meet customer needs. This effort will evaluate quality of service coordination/transfer times, identify gaps, and advance data-backed improvements to service coordination/transfer coordination.
2. Develop an inventory of station amenities that support transit transfer experience at the three focus stations, identify priorities for amenity provision through the co-creative process, and a comprehensive list of gap closure needs to support transfers and transfer experience.

Deliverables:

- GTFS Pathway files for three stations and connectivity tool test outputs
- Inventory of transit transfer amenities, amenity prioritization, and gap closure needs at three stations
- Formulate optimal transit transfer strategies for three key stations

Plan, Share and Implement

In this task, BART will further advance plans and share data to improve rider experience and grow transit ridership. This includes the following elements:



1. Define implementable service changes
2. Provide improved passenger information at each bus stop by piloting the provision of GTFS schedule, real-time, and alert information through QR codes at each station bus stop. BART will coordinate with MTC, the California Integrated Travel Project (Cal-ITP), and stakeholders to identify ways that this can be done to support specific rider needs and preferences.
3. Develop a Transit Transfer Capital Improvement Plan using the inventory of amenities, co-created priorities, and analysis of gap closure needs developed in the evaluation of transit service connectivity.
4. Develop a Station Access Signage Plan at each of the three focus stations. Using newly updated regional station access signage standards for all station access modes. This supports access to stations, and legibility of stations for all user types, including those with disabilities and non-English speakers. Improving the legibility of stations expands travel options and opportunities for new and occasional transit riders.
5. Partner with app developers, MTC, and Cal-ITP to research and pilot GTFS Pathways advances to provide specific guidance for mobility impaired passengers related to elevators and escalators, in-station route guidance and re-routing when an elevator or escalator is out of service.

Deliverables:

- Service change definition and documentation
- Pilot of QR codes to provide up to date transit transfer passenger information
- Transit Transfer Capital Improvement Plan
- Station Access Signage Plan
- Design, upload and test GTFS Pathways data files in trip planning tools to depict outcomes

II. DEMONSTRATE NEED

1. BART Service Provision

BART operates five (5) lines of basic weekday service, variants of which are deployed for off-peak, weekend and special event services. These may also be supplemented by peak commute trains slotted among the basic services and operating over shorter segments of the full basic routes. The five lines of service are defined in the following table and illustrated in the following system map.

Table 2. BART Weekday Service Pattern

Line of Service		Operating Between		Route Length
Color	Train Series	Terminal 1	Terminal 2	(miles)
Green	100	Berryessa	Daly City	53.51
Orange	200	Richmond	Berryessa	50.84
Yellow	300	Antioch	SF International Airport	52.39
Red	400	Richmond	Millbrae	36.79
Blue	500	Dublin/Pleasanton	Daly City	39.24

Figure 4. Current BART Service Map

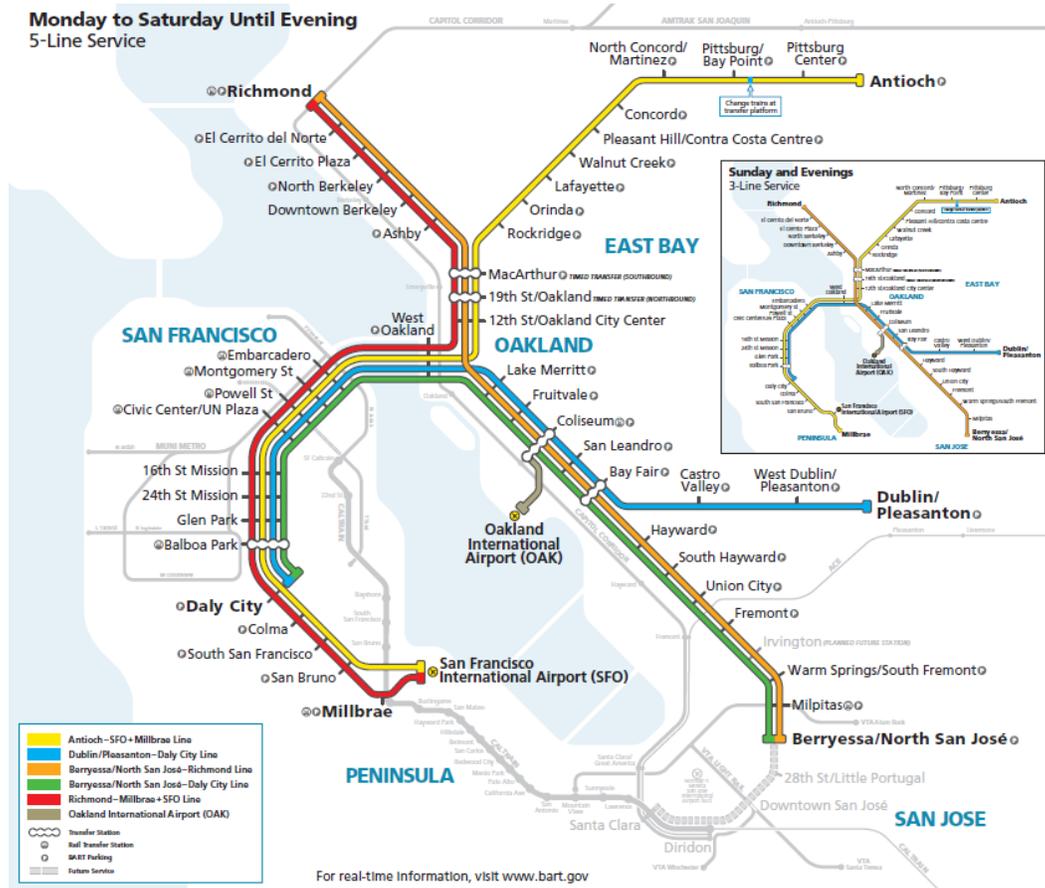
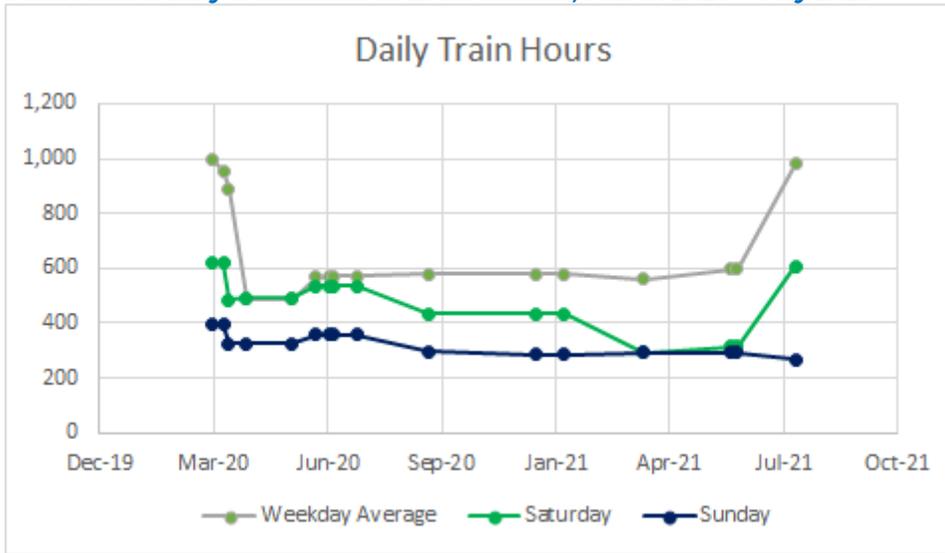
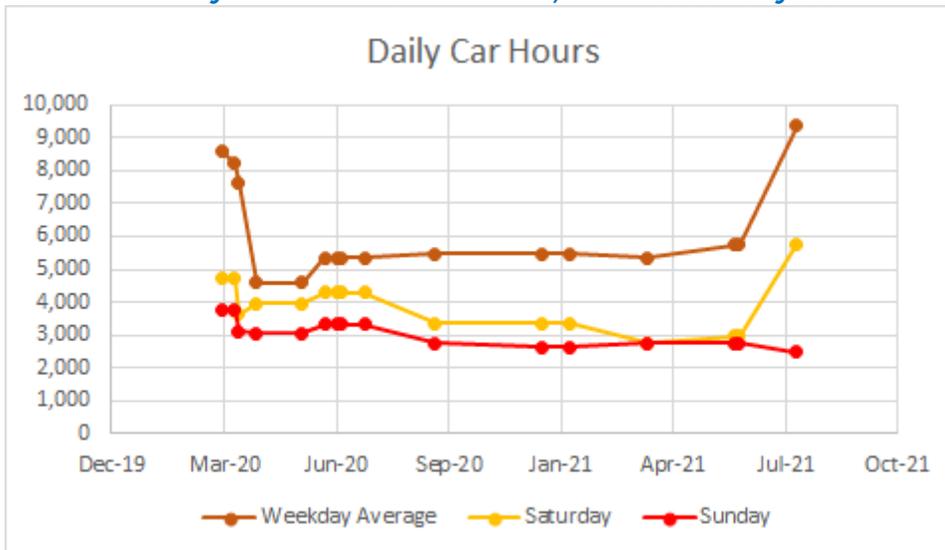


Figure 5. Scheduled daily train hours of BART service, March 2020 – July 2021



In response to the pandemic, BART quickly modified service in March and April 2020 to about 60% of train service, including longer headways and shorter operating hours. BART restored 15-minute headways and operating hours for Monday through Saturday starting in August 2021.

Figure 6. Scheduled daily car hours of BART service, March 2020 – July 2021



When BART restored headways and operating hours six days per week in August 2021, train hours were very close to pre-pandemic levels. Car hours were actually higher than pre-pandemic levels, due to the decision to run long trains to enable continued social distancing. In addition, the complex effort of re-establishing and coordinating transit connections at BART stations is an important component of the restoration of BART service. BART has been working closely with its partner transit operators in the region and has identified a range of actions to be undertaken to improve the quality of transfer, including improving data to support transfer

coordination and customer information availability, as well as improving wayfinding, signage and station amenities.

Figure 71. Scheduled daily train miles of BART service, March 2020 - July 2021

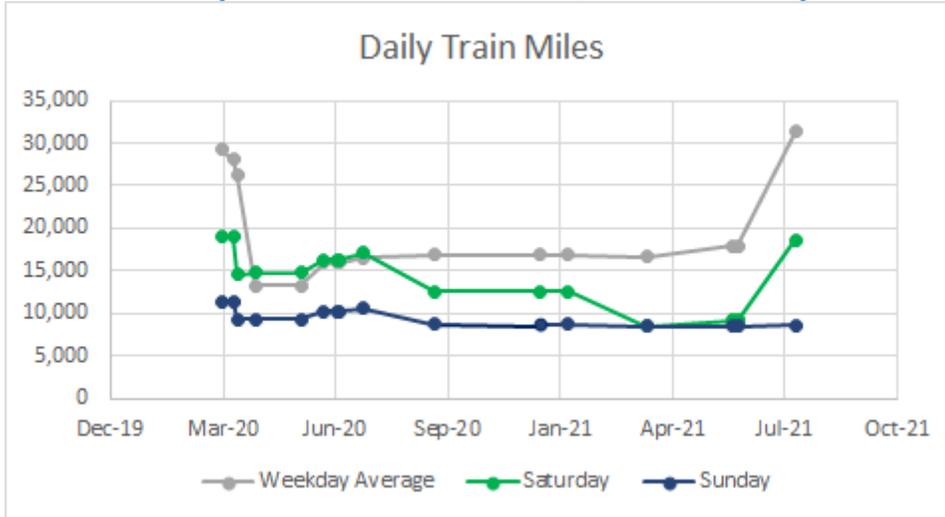
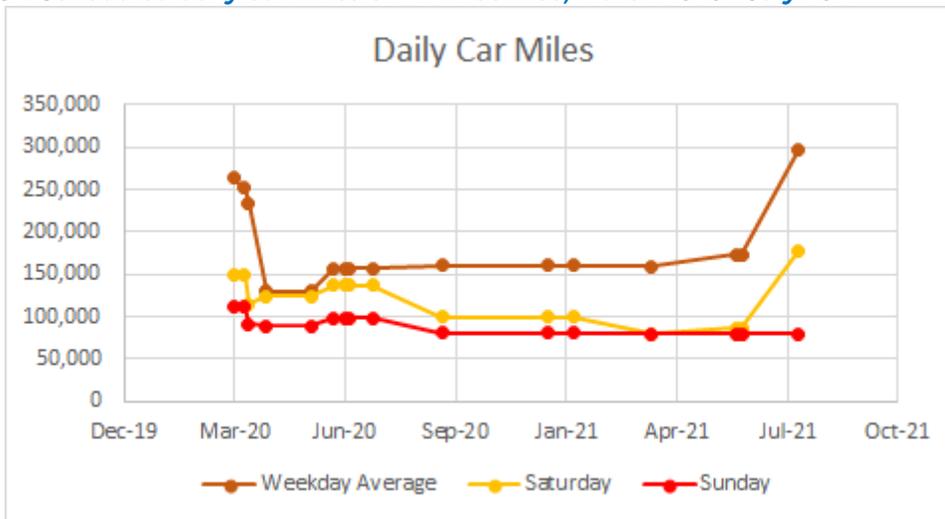


Figure 82. Scheduled daily car miles of BART service, March 2020 - July 2021



Post-pandemic train hours and train miles received a boost because BART opened the San Jose extension to Berryessa in June 2020.

2. BART Ridership Changes

Figure 9 on the next page illustrates the profound effects of the COVID-19 pandemic on BART’s ridership, which declined station-by-station an average of 89 percent on weekdays, slightly less on weekends.





Figure 93. Station Exits August 2020 vs August 2019

Exit Station	Number of Exits per Station per Day								
	Pre-Covid - August 2019			Post-Covid - August 2020			Percent Change - Pre- to Post-Covid		
	Saturday	Sunday	Weekday	Saturday	Sunday	Weekday	Saturday	Sunday	Weekday
12th Street Oakland	3,874	3,636	13,890	585	464	1,223	-85%	-87%	-91%
16th Street Mission	6,889	4,416	12,841	1,093	723	1,740	-84%	-84%	-86%
19th Street Oakland	3,546	2,693	13,128	498	397	965	-86%	-85%	-93%
24th Street Mission	6,379	4,546	11,770	973	691	1,605	-85%	-85%	-86%
Antioch	958	714	2,944	252	190	595	-74%	-73%	-80%
Ashby	2,128	1,589	4,906	341	241	502	-84%	-85%	-90%
Balboa Park	4,248	3,139	9,760	782	560	1,441	-82%	-82%	-85%
Bay Fair	2,461	1,686	5,199	705	535	1,083	-71%	-68%	-79%
Berryessa	N/A	N/A	N/A	211	169	234	N/A	N/A	N/A
Castro Valley	1,182	781	2,825	183	120	320	-84%	-85%	-89%
Civic Center / UN Plaza	8,854	5,791	23,009	1,113	814	2,860	-87%	-86%	-88%
Coliseum	6,895	5,214	5,752	553	420	1,169	-92%	-92%	-80%
Colma	1,218	1,030	4,298	258	197	496	-79%	-81%	-88%
Concord	1,678	1,331	5,619	455	363	898	-73%	-73%	-84%
Daly City	4,039	2,735	8,894	673	460	1,225	-83%	-83%	-86%
Downtown Berkeley	6,699	4,557	11,617	707	494	1,000	-89%	-89%	-91%
Dublin / Pleasanton	3,598	2,370	8,437	303	227	706	-92%	-90%	-92%
El Cerrito Del Norte	3,147	2,146	7,852	718	502	1,428	-77%	-77%	-82%
El Cerrito Plaza	2,231	1,566	4,699	294	223	527	-87%	-86%	-89%
Embarcadero	13,468	10,517	49,686	1,285	833	2,937	-90%	-92%	-94%
Fremont	1,873	1,239	5,763	217	167	569	-88%	-87%	-90%
Fruitvale	3,877	2,527	7,636	1,051	748	1,840	-73%	-70%	-76%
Glen Park	3,003	2,258	7,114	391	294	804	-87%	-87%	-89%
Hayward	1,664	1,225	4,628	252	223	851	-85%	-82%	-82%
Lafayette	741	704	3,600	156	109	242	-79%	-85%	-93%
Lake Merritt	3,363	1,808	6,867	545	472	951	-84%	-74%	-86%
MacArthur	3,516	2,775	8,910	593	453	1,082	-83%	-84%	-88%
Millbrae	2,294	1,546	6,098	189	148	379	-92%	-90%	-94%
Milpitas	N/A	N/A	N/A	96	80	150	N/A	N/A	N/A
Montgomery Street	10,084	5,911	45,550	1,079	960	3,133	-89%	-84%	-93%
North Berkeley	1,975	1,516	4,171	204	142	341	-90%	-91%	-92%
North Concord / Martinez	405	353	1,900	69	59	200	-83%	-83%	-89%
Oakland Airport	662	560	1,374	62	61	102	-91%	-89%	-93%
Orinda	2,159	1,248	2,963	87	70	176	-96%	-94%	-94%
Pittsburg / Baypoint	1,056	832	3,891	307	231	788	-71%	-72%	-80%
Pittsburg Center	376	295	1,170	135	100	292	-64%	-66%	-75%
Pleasant Hill / Contra Costa Centre	1,352	1,164	7,520	266	195	610	-80%	-83%	-92%
Powell Street	17,513	11,107	25,280	1,944	1,248	3,282	-89%	-89%	-87%
Richmond	2,068	1,457	4,405	573	412	1,091	-72%	-72%	-75%
Rockridge	2,457	2,017	5,604	245	193	341	-90%	-90%	-94%
San Bruno	1,393	1,152	3,613	214	164	455	-85%	-86%	-87%
San Francisco Int'l Airport	4,162	3,805	6,659	305	312	494	-93%	-92%	-93%
San Leandro	2,688	1,833	6,164	570	397	1,202	-79%	-78%	-80%
South Hayward	1,065	728	2,929	201	155	595	-81%	-79%	-80%
South San Francisco	945	729	3,396	175	123	396	-81%	-83%	-88%
Union City	1,532	1,085	4,693	218	155	528	-86%	-86%	-89%
Walnut Creek	1,651	1,529	6,674	371	294	582	-78%	-81%	-91%
Warm Springs / South Fremont	2,031	1,377	4,354	96	82	233	-95%	-94%	-95%
West Dublin / Pleasanton	1,472	1,020	3,688	154	101	263	-90%	-90%	-93%
West Oakland	3,668	2,853	7,118	617	474	1,090	-83%	-83%	-85%
TOTAL	164,537	117,102	410,858	23,365	17,244	46,020	-86%	-85%	-89%

The figure also indicates those stations that have maintained the greatest continuing proportions of their ridership during the first year of the pandemic, retaining at least 20% of ridership on average over the seven-day week, summarized in Table 3, below. As shown in the Project Description, the majority of these stations are also within Persistent Poverty census tracts.



Table 3. Weekday Ridership Decline at Select BART Stations

Station	Weekday Ridership Decline			
	Weekday	Saturday	Sunday	7-Day Average
Antioch	-80%	-74%	-73%	-78%
Bay Fair	-79%	-71%	-68%	-76%
Fruitvale	-76%	-73%	-70%	-75%
Pittsburg/Bay Point	-80%	-71%	-72%	-78%
Pittsburg Center	-75%	-64%	-66%	-72%
Richmond	-75%	-72%	-75%	-75%
San Leandro	-80%	-79%	-78%	-80%
South Hayward	-80%	-81%	-79%	-80%

III. DEMONSTRATE BENEFITS

1. Project Benefits

With the work funded by this grant, BART will identify, prioritize, and calibrate measurements of equity over a range of dimensions for representative stations. As described above, BART will identify aspects of its operations that can be equitably improved across its entire network, to provide the highest-quality service to riders of all demographics, employment, and travel needs. The benefits of the work described in the Project Description above are anticipated to include:

Ridership Recovery. BART's forecasts of post-pandemic ridership are subject to a wide range of uncertainty, related directly to trends in the infectiousness of the COVID-19 virus, to employees' return to their places of work, and to public perception of the health risks of mass transit. BART's strategy for forecasting ridership in this environment has been to define best and worst cases for ridership recovery over time, as well as a conservative median forecast. The same process may be adjusted and applied to cohorts that do not follow the predominant historical patterns of BART commute ridership. This will enable BART to characterize those cohorts, understand their needs and choices, and advance improvements to better serve existing riders as well as grow ridership by better serving and the evolving needs of BART's ridership base.

Quality of Service. Numerous dimensions of service quality may be assessed both as determinants of ridership and measures of equity. For these attributes, BART will compare representative key stations serving disadvantaged populations with the stations serving more general or more advantaged populations. Quality of service may be characterized by such measures as origin-destination travel time, hours of service, transfer times, crowding on trains and in stations, station wait times, availability of single-seat rides, signage and wayfinding, connectivity with other transit services, amenities, passenger information systems, or other topic areas identified in the rider co-creative process and survey. For example:

- *Improve transit travel times* Travel time improvements are a function of the service timetable and the vulnerability of train operations to delay. While on-time performance is always a key performance indicator, schedule adherence may vary across lines of service, times of day, and individual stations. BART uses standard enterprise scheduling software to optimize the timetable for a range of criteria, including equitably minimizing travel times.
- *Hours of service* are a vital factor for essential workers and service workers, subject to the specific demands of their employment. Hours of service are defined in the timetable, which may be modified in response to the distribution of travel across the service day, including leveling peak period capacities to serve a wider range of employment hours. This could also include expansion or enhancements to non-rail services that are outside of BART's normal operating hours, like the Early Bird Express. These efforts support BART's need to maintain non-service hours during which network infrastructure is maintained and improved.

- *Station wait times* are the direct effects of service frequency and schedule adherence upon passengers, who may depend on frequent and reliable service. BART operates all five lines of weekday service at equal base frequencies of four trains per hour or 15 minutes between trains, the trains sequenced to smoothly intersect at the Oakland Wye. Additional trains may be inserted among base trains on particular lines to serve peak-period demand. As a measure of service quality, wait time may be addressed via the frequency and spacing of trains defined in the train timetables for the entire week, as well as by improving station access and passenger information. BART will evaluate opportunities to equalize and improve service frequency using the enterprise scheduling software that is the principal tool for all BART timetable formulation.
- *Crowding* on trains and in stations may be addressed by BART's train timetable and route structure. Whereas crowding has historically been associated with morning and evening weekday peak commute periods, it may occur in different degrees, and at different times throughout the week in the post-pandemic environment. BART will assess where and when crowding is likely to occur, and how its routes and schedules may be crafted to balance crowding equitably across the network, the entire week, and total ridership. In combination with trip planning tools, the GTFS Pathways effort mentioned above has the potential to guide passengers to trains or areas of the train that are typically less crowded during the commute
- *Transfers* between lines of service are typically considered disadvantageous, adding time, complexity, and discomfort to a trip. BART will assess the equitability with which transfers are required and where those transfers occur relative to trip demand, including during weekends and off-peak periods. The goal will be to balance the need for transfers on the routes and at the times that most affect transit-dependent riders with those of the broader network and ridership.

Improved Passenger Experience and Reduced Travel Time. Improved passenger experience will not only improve the quality of BART service but also support ridership recovery. Further, key elements outlined below will serve to improve passenger information and thereby improve quality and reduce overall travel time, including time to transfer and/or plan a trip.

- *Signage and wayfinding* are system design facets that fundamentally define the passenger experience. BART is currently leading an update of regional station access signage standards to support improved access to stations and transfers between BART and connecting transit services provided by other operators. These incorporate design features that will provide benefit to all user types while specifically addressing the needs of people with disabilities and non-English speakers. Improved signage and wayfinding can reduce travel time through reductions in walk time between connecting services and reducing barriers to accessing stations and using transit. As part of each station's improvement plan, BART will develop a signage and wayfinding plan to improve access to stations and transfers between services.



- *Passenger information systems* are also key aspects of the BART passenger experience. Likewise, they bear continual review to maintain accuracy, currency, ease of use, and efficacy across the broadest spectrum of BART ridership. BART, in coordination with MTC staff, has been investigating the utility of developing and maintaining a data set that uses the new GTFS Pathways standard. This data set offers the capability of providing navigation within complicated stations from train platform to connecting transportation such as bus stops or passenger loading zones. Furthermore, BART is interested in coordinating with third party navigation applications to identify features that will support people with mobility impairments to be able to select preferences for features such as elevators and escalators. While this data set provides improved passenger information for all user types, it fills specific needs for people with vision and mobility impairments as well as non-English speakers, who can use navigation instructions on their smartphone in a way that best fits their needs. BART will also pilot provision of QR code hyperlinks to GTFS schedule, real-time, and alert information at transit hub bus stops. These passenger information system improvements support improved travel times by reducing walk times between BART and connecting transit and improve transit user experience. This project will support collection of the detailed data for GTFS Pathways at the three stations, piloting GTFS Pathways data integration into trip planning tool, and piloting QR codes to provide up to date transit transfer passenger information
- *Connectivity* is a critical determinant of the quality of BART passenger experience and includes the inventory of opportunities that are accessible via BART, the travel time to access such opportunities, and the ease of transferring to different routes and modes to increase the inventory of opportunities. Equitable connectivity will be characterized by enabling the same convenience of access to opportunities from all stations and for all ridership cohorts. In addition to the passenger information benefits of the GTFS Pathways data set mentioned above, it will also support development of improved walk-time estimates between train platforms and bus stops. This will be uploaded to the new Transit Transfer Analysis Tool (TTAT) developed by MTC and piloted by regional transit operators to improve schedule coordination between key transit routes.
- *Amenities* at stations and on trains may not be consistently available across the network, resulting in disparate passenger experiences. Elements such as waiting benches, artwork, passenger information displays, lighting, parking, and lavatories may vitally determine passengers' perceptions of the quality of their experience. It is important that these elements not be weighted toward or away from stations serving particular markets. As part of this project, BART will inventory amenities for those passengers transferring between BART and buses and develop a capital improvement plan.

2. Racial Equity and Barriers to Opportunity

Among the demographic measures BART will consider for the communities served by key stations will be automobile ownership and dependence as a barrier to opportunity. BART's process will include outreach to riders at representative key stations and compilation of their responses to



questions about their perceptions and preferences. All of this work will be informed and supported by BART's Office of Civil Rights, alongside their ongoing work to understand the demographics of riders, their transportation needs and preferences, distribution of service amenities and the measurement and maintenance of equity across our entire service area.



IV. PROJECT IMPLEMENTATION STRATEGY

1. Scope Overview

The scope of this project is comprised of four tasks:

1. *Identify Needs*

Better understand the needs of traditionally marginalized communities, including historically oppressed groups such as low-income communities, recent arrivals to our region such as immigrants and refugees, the disabled and members of our LGBTQ+ communities who collectively represent our priority population:

- a. Update data on BART ridership patterns for priority populations;
- b. Select three stations emphasizing stations that serve these traditionally marginalized communities and encompasses a geographically diverse set of stations;
- c. Engage with CBOs and community leaders to define and undertake a co-creative process where we directly engage with community members who reside within the catchment area of the stations identified in step b or who use the three stations identified in step b;
- d. Develop and collect data from a survey of current riders at the three stations identified in step b;
- e. Analyze information from the survey, co-creative process and any other pertinent information identified to better understand travel patterns, public transit usage and identify barriers to equitable access for priority populations; and
- f. Use the information from this process to develop approaches in partnership with our priority populations.

2. *Evaluate BART Service*

Evaluate BART service responsiveness to target population needs:

- a. Compare identified needs with current service provision
- b. Evaluate service patterns and frequencies to balance the needs and priorities of essential workers, service workers, and discretionary riders with those of peak commuters.
- c. Recommend and/or implement improvements to reduce travel time and/or improve the quality or frequency of service for target populations.

3. *Evaluate Transit Service Connectivity*

Supporting end-to-end journeys in the context of the regional transit network, including integration with connecting transit systems; access for persons with disabilities; consistent wayfinding; and robust passenger information systems and their efficacy in making journeys clear, efficient, and reducing overall travel time. This task will collect data, evaluate transit service transfer quality, and recommend improvements to improve quality and reduce travel times.

- a. Pilot Smart Station Transfer Design (in partnership with MTC:

- i. Develop and implement detailed GTFS Pathways files for each of the identified stations to enable the BART Trip Planner and third-party apps to guide passengers through stations and between transit modes supporting:
 1. Shortest distance/time walking routes.
 2. Route preferences such as elevator and escalator, supporting people with disabilities or other specific mobility needs.
 3. Detailed personalized navigation for people with disabilities, non-English speakers, and first-time or occasional transit users and those exploring new routes.
- ii. Undertake a detailed connectivity analysis.
 1. Collaborate with MTC to leverage MTC's Transit Connectivity Tool in evaluating multi-modal connections
 2. Optimize alignment of transfer trips between transit agencies with enhanced analytic tools to recommend service improvements that meet customer needs
 3. Evaluate quality of service coordination/transfer times, identify gaps, and advance data-backed improvements to service coordination/transfer coordination.
- iii. Develop an inventory of bus amenities and identify needs.

4. *Plan, Share and Implement*

Advance planning and data sharing to improve rider experience and grow transit ridership.

- a. Implement identified service changes
- b. Pilot provision of GTFS schedule, real-time, and alert information through QR codes at each station bus stop
- c. Develop Capital Needs and Station Access Signage Plan at each of the identified stations, using newly updated regional standards, identification, wayfinding, and regulatory/instructional signage. This includes bus bay numbering schemes that support navigation, improved passenger information, and improved operational efficiency.
- d. Partner with app developers, MTC, and Cal-ITP to research and pilot GTFS Pathways advances to provide specific guidance for disabled passengers related to elevators and escalators, in-station route guidance and outage re-routing.

2. Project Schedule

Table 4 on the next page shows the proposed schedule for the four project tasks described in the previous subsection.



Table 4. Project Tasks and Timeline

Task	Q1	Q2	Q3	Q4	Q5	Q6
1: Identify Needs	■	■				
2: Evaluate BART Service			■	■		
3: Evaluate Transit Service Connectivity			■	■		
4: Plan, Share, and Implement					■	■



V. TECHNICAL, LEGAL AND FINANCIAL CAPACITY

BART has a strong track of technical, legal, and financial capacity to undertake projects funded via the Federal Transportation Agency. BART has no unresolved legal, technical, or financial compliance issues from an FTA compliance review or Federal grant related audit.





VI. DETAILED PROJECT BUDGET

The table below provides details the costs associated with each of the tasks outlined in the Project Description.

Table 5. Proposed Project Budget

TASK	BUDGET
1: Identify Needs	\$250k
a. Update data on BART ridership patterns for priority communities	
b. Co-Creation Process / summarize community feedback	
c. Conduct rider survey at three focus stations and analyze resulting data	
2: Evaluate BART Service	\$130k
a. Compare identified needs to current service provision	
b. Evaluate service patterns and frequencies	
c. Recommend improvements for target populations	
3: Evaluate Transit Service Connectivity	\$350k
a. Pilot smart station transfer design	
I. Develop GTFS Pathways files	
II. Analyze Route Transfer Connectivity	
b. Inventory of amenities	
4: Plan, Share and Implement	\$270k
a. Define implementable service changes	
b. Pilot QR Codes	
c. Develop capital plan for transfer amenities, and station access signage plan	
d. Partner with apps & pilot GTFS	
TOTAL	\$1.0M