



FY23 Reimagined Short Range Transit Plan

NOVEMBER 2022

SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT



Introduction

The Metropolitan Transportation Commission (“MTC”), in cooperation with Region IX of the Federal Transportation Administration (“FTA”), requires each transit operator receiving federal funds to prepare, adopt, and submit a Short Range Transit Plan (“SRTP”). Considering the impacts of the COVID-19 pandemic, MTC has restructured the SRTP guidelines for FY 2022-23. The revised approach narrows the planning horizon to five years and asks operators to consider how service plans might be adapted under different revenue scenarios. The revised approach aims to:

- Understand the status and outlook of transit service in the Bay Area, both by operator and regionally
- Conduct a financial “stress test” to understand the impacts of varying levels of funding on transit service
- Develop actionable information to support funding advocacy, including the ability to articulate service benefits and tradeoffs at different funding levels

Accordingly, operators are asked to make projections of service levels under three specific revenue scenarios:

- “Robust Recovery”: There is adequate funding to return overall revenue to 100% of pre-pandemic levels, with escalation. Note that for BART, this level of revenue recovery does not appear feasible with our traditional sources - it would require a new source of revenue.
- “Some Progress”: Federal relief funds are eventually exhausted and total revenue available to the agency is 15% below pre-pandemic levels for the next five years.
- “Fewer Riders”: Federal relief funds are eventually exhausted, although other funds recover to pre-pandemic levels. However, farebox revenue remains stagnant for the next five years.

In accordance with the SRTP guidelines, **Section 1** of this document describes pre-pandemic BART service and ridership; **Section 2** describes the current state of service and ridership; and **Section 3** provides the scenario planning exercise.

Important context for BART board members and stakeholders: In reviewing this document, BART board members and stakeholders should be aware that the Reimagined SRTP scenarios differ from the District’s own internal planning scenarios in significant ways: the revenue levels are specified by MTC and are meaningfully different than the Base Case, Upside, and Downside scenarios prepared for the FY23-24 budget process; the resulting service scenarios do not reflect actual planned service. A companion document, the *FY23-32 Operating Financial Outlook* presents a more traditional overview of BART’s 10-year operating financial outlook that is consistent with BART’s own planning scenarios.

Despite these differences, the exercise serves to demonstrate a critically important set of constraints in BART’s path to post-pandemic fiscal stability. Specifically, it shows that because of the high fixed costs and low marginal costs of operating heavy rail, very deep service reductions would be needed to bring expense in line with specified revenue levels in either the Some Progress or Fewer Riders scenarios. Further, the resulting minimal level of service would not provide enough capacity to accommodate the ridership assumed in the respective revenue scenarios: actual operating revenues would be further reduced, requiring additional service cuts and further loss of ridership and fare revenue. This unstable outcome is known in the transit industry as a “death spiral.”

The findings of the analysis support the conclusions and path of action discussed in the District’s recent planning and budget work: BART cannot cut service to achieve fiscal stability. Along with prudent cost containment and investments in ridership recovery, sustaining BART service after federal funding will require a new revenue model.

The preparation of this report has been funded in part by a grant from the U.S. Department of Transportation (“DOT”) through section 5303 of the Federal Transit Act. The contents of this SRTP reflect the views of BART, and not necessarily those of the FTA or the MTC. BART is solely responsible for the accuracy of the information presented in this SRTP.

Contents

- 1 Pre-pandemic State of Service – FY 2018-19 4**
 - 1.1 What did operations look like before the pandemic?..... 4
 - 1.2 How much service was available? / Where, when, and how was service deployed?..... 5
 - 1.3 What did ridership levels and travel patterns look like?..... 6
- 2 Current State of Service: FY 2022-2310**
 - 2.1 How have service and operations changed since the pandemic? How much service is available now?10
 - 2.2 How has the distribution of service changed by geography? Time of day? Mode?.....12
 - 2.3 Changes to ridership and travel patterns since the start of the pandemic.....12
 - 2.4 How have equity priority communities been considered in service planning or changes?.....17
 - 2.5 How has the operating budget changed?.....17
- 3 Scenario Planning Concepts: FY24 through FY28..... 18**
 - 3.1 Methodology..... 18
 - 3.2 Robust Recovery.....20
 - 3.3 Some Progress.....21
 - 3.4 Fewer Riders.....24



1 Pre-pandemic State of Service – FY 2018-19

1.1 What did operations look like before the pandemic?

Prior to the COVID-19 pandemic, BART operated five lines of heavy rail service over a radial network with stations in Alameda, Contra Costa, San Francisco, and San Mateo counties (see **Figure 1-1**). BART service extended as far as Millbrae, Richmond, Antioch, Dublin/Pleasanton, and Fremont. The heavy rail service spanned 108 route-miles of track serving 47 stations across the four counties, including the ten-mile extension (“BART to Antioch”) served by Diesel Multiple Units to Pittsburgh Center and Antioch stations, opened in May 2018. In addition, BART operated a 3-mile-long automated guideway system (“BART to OAK”) that provided connecting service between Coliseum and Oakland International Airport stations. Finally, BART partnered with the East Bay Paratransit Consortium to deliver demand-responsive ADA service during all revenue-service hours.



Figure 1-1 FY19 BART System Map

1.2 How much service was available? / Where, when, and how was service deployed?

This section describes BART's service as operated in FY 2018-19 ("FY19") after the February 2019 service change until the beginning of the COVID-19 pandemic in 2020.

Each BART service line is identified by color (Yellow, Blue, Red, Orange, and Green) as shown in **Figure 1-1**. On weekdays, service started at 5:00 am with 5-line service running until 7:30 pm, when Green line service ended operations. Then, 4-line service ran until 9:00 pm, when Red line service ended operations. Finally, 3-line service ran for the remainder of the service day, with final train dispatches around midnight. Train headways were 15 minutes on each service line from system open until 7:30 pm, 20 minutes from 7:30 pm to 9:00 pm, and 24 minutes for the remainder of the evening. To serve peak period demand, extra yellow line trains were dispatched during peak AM and PM commute hours.

On Saturdays, service started at 6:00 am, with 5-line service running until 7:00 pm, and 3-line service running until final train dispatches around midnight. Train headways were 20 minutes on each service line all day.

On Sundays and major holidays, service started at 8:00 am, with 3-line service running all day until final train dispatches around midnight. Train headways on each service line were 20 minutes during the day, and 24 minutes after 9:00.

BART to OAK service mimicked heavy rail service hours with headways of six minutes until 10:00 pm, and 20 minutes thereafter.

While headways are described on a line-by-line basis, stations serviced by two or more lines would experience more frequent service, as many as 24 weekday peak trains per hour on BART's transbay trunk line.

BART's February 2019 service plan, detailing hours of service, headways, and routes are summarized in **Table 1-1**.

Table 1-1 FY19 BART Service Plan (post February 2019)

| Day of Week | Hours of Service | Headways (min) | Routes in Service | | | | |
|-------------|--------------------|----------------|-------------------|---|---|---|---|
| | | | ■ | ■ | ■ | ■ | ■ |
| Weekdays | 5:00 am – 7:30 pm | 15 | ■ | ■ | ■ | ■ | ■ |
| | 7:30 pm – 9:00 pm | 20 | ■ | ■ | ■ | ■ | |
| | 9:00 pm – 12:00 am | 24 | ■ | ■ | ■ | | |
| Saturday | 6:00 am – 9:00 am | 20 | ■ | ■ | ■ | | |
| | 9:00 am – 7:00 pm | 20 | ■ | ■ | ■ | ■ | ■ |
| | 7:00 pm – 12:00 am | 20 | ■ | ■ | ■ | | |
| Sunday | 8:00 am – 9:00 pm | 20 | ■ | ■ | ■ | | |
| | 9:00 pm – 12:00 am | 24 | ■ | ■ | ■ | | |

Table 1-2 provides a snapshot of BART service after the February 2019 service adjustment, presenting annualized key operating metrics: the number of vehicles required during peak service hours, a count of the total fleet of train cars, the

number of trains that operated during peak periods, total hours that train cars were in service, and total miles that train cars travelled.

Table 1-2 BART FY19 Service Plan Annualized Operating Metrics (post-February 2019)

| Operating Metric | FY19 |
|---|------|
| Total Peak Vehicle Requirement ¹ | 632 |
| Total Fleet | 723 |
| Peak Period Trains ¹ | 65 |
| Total Car Hours (million) | 2.6 |
| Total Car Miles (million) | 88.6 |
| Notes: | |
| 1. Includes ready reserve and training cars | |

Note that during FY19 BART enacted a service change in February 2019 to accommodate the Transbay Tube Earthquake Safety Retrofit project. The principal changes were shifting the start of revenue service on weekdays from 4:00 am to 5:00 am and increasing line headways on weekday and Saturday evenings from 20 minutes to 24 minutes.

1.3 What did ridership levels and travel patterns look like?

In FY19, ridership for the year totaled 118.1M with weekdays averaging 411,000. As **Figure 1-2** shows, daily trips remained relatively stable with typical seasonal variation as observed in prior years. Across the weekdays, ridership was slightly lower on Mondays and Fridays compared to mid-week (see **Figure 1-3**). Saturday and Sunday ridership averages were 39% and 28% of the average weekday, respectively.

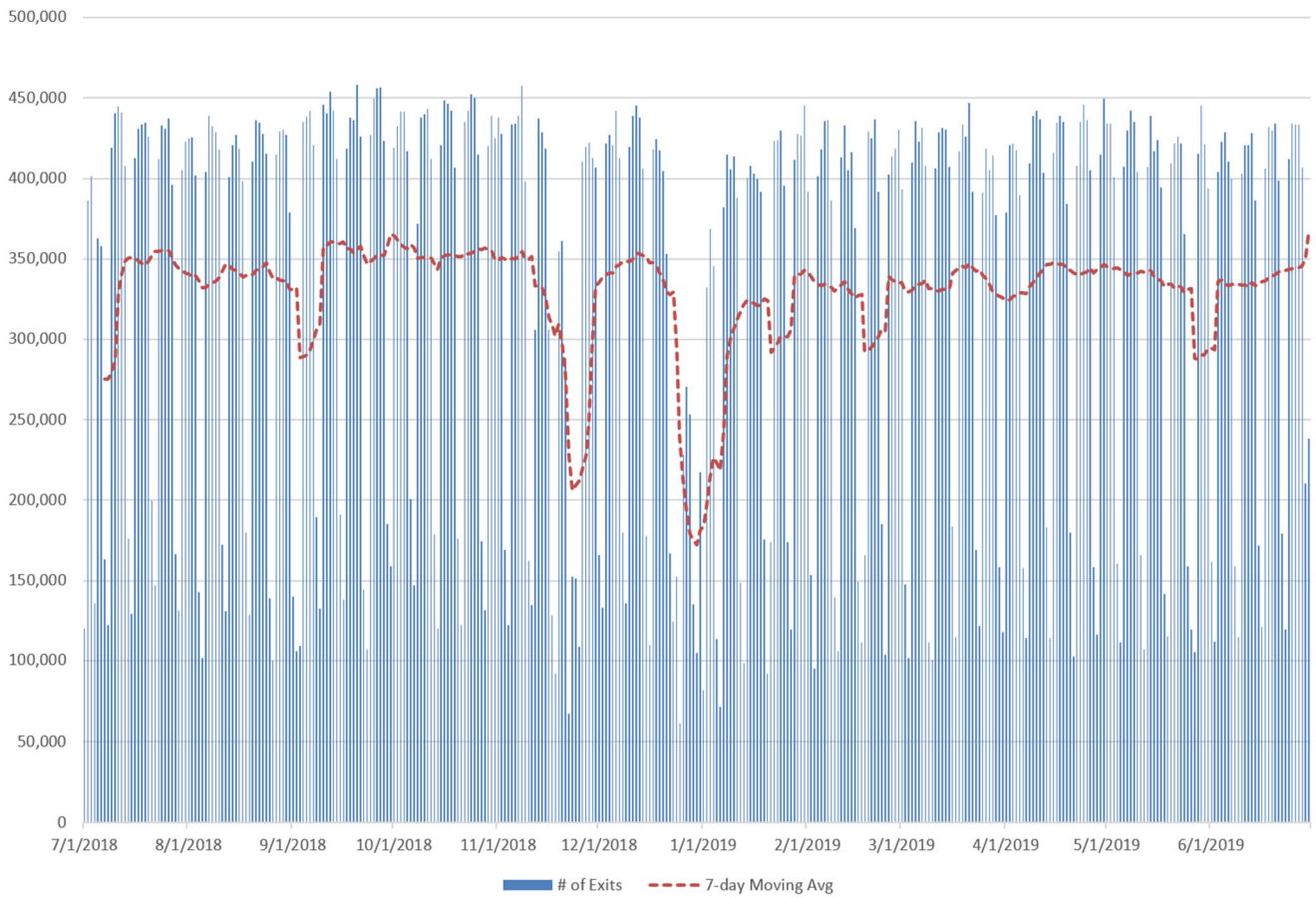


Figure 1-2 FY 2018-19 Ridership

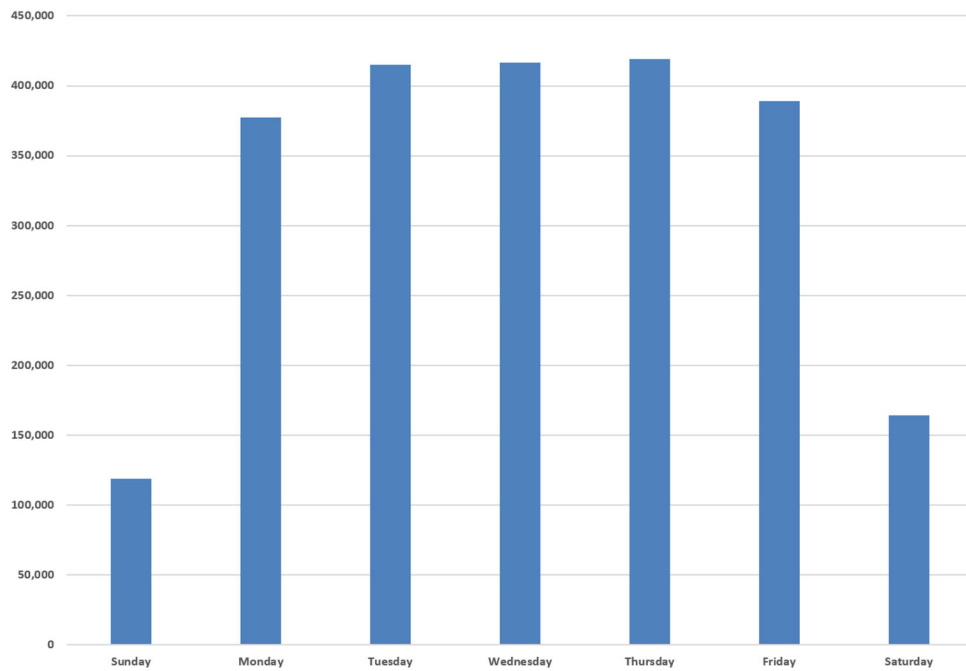


Figure 1-3 FY19 Average Total Ridership by Day of Week

Work trips made up an estimated 70% of BART trips, the largest share of which were weekday trips bound for downtown San Francisco stations (Embarcadero, Montgomery, Powell, and Civic Center) and downtown Oakland stations (12th Street/Oakland City Center, 19th Street Oakland, and Lake Merritt). Across an average weekday, BART ridership exhibited a dual-peaked pattern, consistent with AM and PM peak commute times (see **Figure 1-4**). The AM and PM peak periods (three hours each) comprised 59% of the total weekday average, and 77% of all weekday trips have one trip end at either one of the downtown San Francisco stations or one of the downtown Oakland stations.

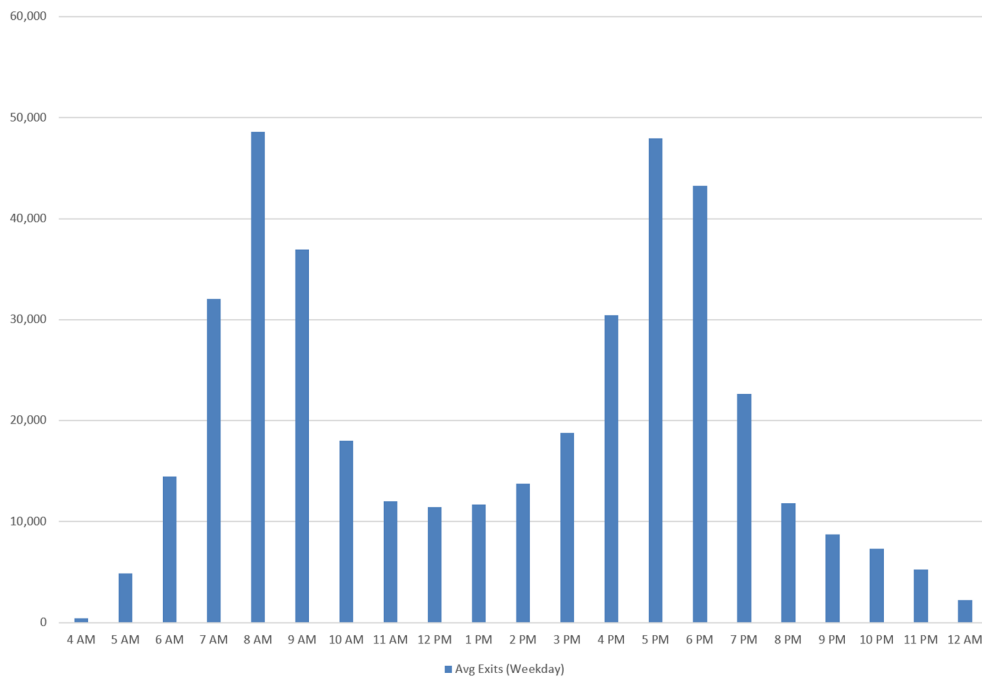


Figure 1-4 FY19 Average Weekday Ridership by Hour

BART trips may be classified as Intra East-Bay, Intra West-Bay, and Transbay. 55% of all weekday trips were Transbay (see **Figure 1-5**), 25% were intra-West Bay, and 20% were Intra-East Bay.

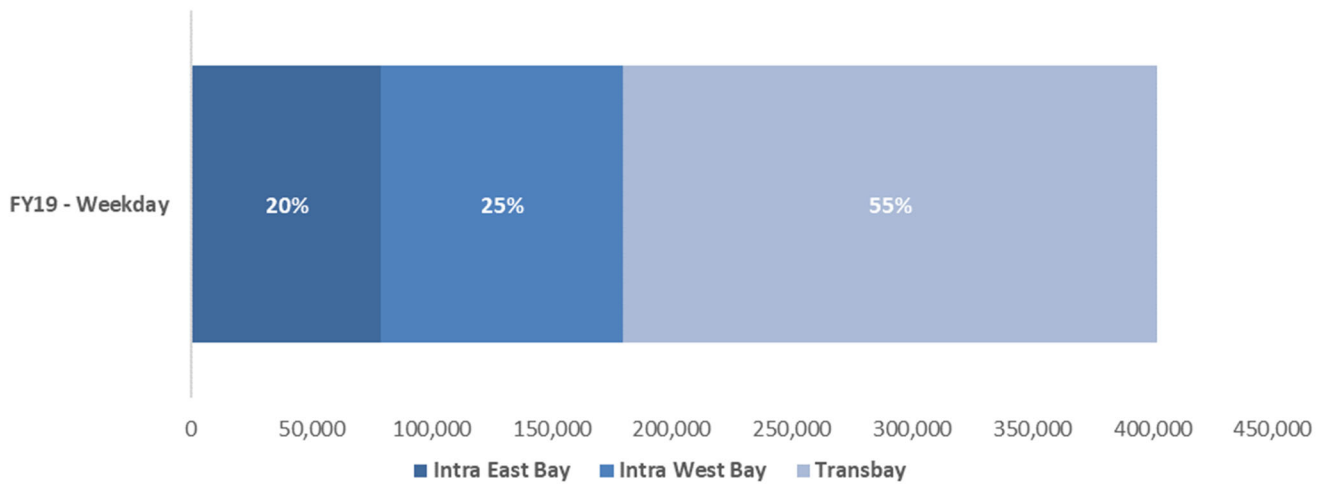


Figure 1-5 FY19 Share of Weekday Trips by Geography

2 Current State of Service: FY 2022-23

2.1 How have service and operations changed since the pandemic? How much service is available now?

In response to reduced ridership (see **Section 2.3** for detailed description of ridership trends during the pandemic), BART incrementally reduced rail service over the first year of the pandemic:

- March 2020: system close at 9:00 pm every day; system start at 8:00 am on Saturdays
- April 2020: increased weekday headways from 15 minutes to 30 minutes; all 10-car transbay trains, all 8-car East Bay trains (to facilitate passenger spacing)
- June 2020: opened new extension with service to Milpitas and Berryessa stations in Santa Clara County
- September 2020: increased weekend headways to 30 minutes (from 20 minutes on Saturdays and 24 minutes on Sundays)
- March 2021: reduced Saturday service from 5-line to 3-line

Service after the March 2021 change represented the lowest level of service provided during the pandemic. With ridership on the rise and emergency federal funding awarded to BART to continue running service, BART began to increase service over the second year of the pandemic:

- June 2021: added peak trains (slotted in between 30-minute headways) on weekdays and Saturdays
- August 2021: extended system close from 9:00 pm to midnight on weekdays; extended system hours on Saturdays from 8:00 am – 9:00 pm to 6:00 am – midnight; reduced daytime weekday headways from 30-minutes to 15-minutes; increased Saturday service from 3-line to 5-line
- February 2022: increased daytime Sunday service from 3-line to 5-line; extended service from 9:00 pm to midnight on Sundays

In September 2022, BART made smaller changes to the service schedule to improve schedule legibility, train spacing at interlined stations, and improved timing to connecting transit, though the general service description has not changed since the February 2022 service increase. **Figure 2-1** presents the FY23 BART system map, showing the BART routes and extents. The system service area is largely the same as it was in FY19, with the exception of the Orange and Green lines extended in June 2020 to serve the Milpitas and Berryessa stations, and the Red and Yellow lines aligned to improve service at Millbrae and SFO International Airport stations. The FY23 service plan summary, detailing service hours, headways, and routes is presented in **Table 2-1**.

Every day until 9pm
5-Line Service Map



Figure 2-1 FY23 BART System Map

Table 2-1 FY23 BART Service Plan

| Day of Week | Hours of Service | Headways (min) | Routes in Service | | | | |
|-------------|--------------------|----------------|-------------------|------|--------|-----|-------|
| | | | Yellow | Blue | Orange | Red | Green |
| Weekdays | 5:00 AM – 9:00 PM | 15 | ■ | ■ | ■ | ■ | ■ |
| | 9:00 PM – 12:00 AM | 30 | ■ | ■ | ■ | | |
| Saturday | 6:00 AM – 9:00 PM | 15 | ■ | | | | |
| | | 30 | | ■ | ■ | ■ | ■ |
| | 9:00 PM – 12:00 AM | 30 | ■ | ■ | ■ | | |
| Sunday | 8:00 AM – 9:00 PM | 30 | ■ | ■ | ■ | ■ | ■ |
| | 9:00 PM – 12:00 AM | 30 | ■ | ■ | ■ | | |

Table 2-2 provides a snapshot of BART service after the September 2022 service adjustment, presenting annualized key operating metrics. The results from the February 2019 service plan are included as a reference. While service hours have

generally stayed the same between the service plans, the primary drivers of the increased operating metrics are the opening of the Milpitas and Berryessa extension stations, running longer trains, and the expanded 5-line service on Sundays.

Table 2-2 BART FY23 Service Plan Annualized Operating Metrics

| Operating Metric | FY19 | FY23 |
|---|------|------|
| Total Peak Vehicle Requirement ¹ | 632 | 636 |
| Total Fleet | 723 | 847 |
| Peak Period Trains ¹ | 65 | 67 |
| Total Annual Car Hours (million) | 2.6 | 2.9 |
| Total Annual Car Miles (million) | 88.6 | 90.8 |
| Notes: | | |
| 1. Includes ready reserve and training cars | | |

2.2 How has the distribution of service changed by geography? Time of day? Mode?

On June 13, 2020, the Milpitas and Berryessa BART stations opened for passenger service, expanding service into Santa Clara County and increasing total track mileage (excluding BART to OAK) from 118 to 128 miles.

As described in **Section 2.1**, BART reduced service during the first year of the pandemic and expanded back to pre-pandemic levels during the second year of the pandemic. As of September 2022, BART is running slightly more total service hours than it did in FY19.

The distribution of service throughout the day has changed since FY19: 5-line service continues later than pre-pandemic service on weekdays and Saturdays; Service on Sundays was increased from 3- to 5-line service until 9:00 pm; and evening headways across all days were changed from 20 to 30 minutes.

BART has continued to run all transit modes since the beginning of the pandemic: heavy rail service including BART to Antioch DMU rail, and BART to OAK automated guideway. Paratransit service is unchanged.

2.3 Changes to ridership and travel patterns since the start of the pandemic

Following the March 17, 2020, Shelter in Place Order (effective in BART service counties), BART ridership declined rapidly. BART's daily weekday ridership fell from a pre-pandemic average of 410,000 trips to approximately 25,000 in April 2020. **Figure 2-2** displays the impact and recovery from the COVID-19 pandemic. From the start of the shelter-in-place mandates until the end of the calendar year, BART ridership remained at approximately 10% of pre-pandemic levels. Initial vaccine distribution began during calendar year 2021 and lasted roughly until the end of October 2021. During this period, ridership gradually recovered in tandem with increased vaccination rates and economic reopening across the Bay Area. From November 2021 to the present, ridership grew steadily and then dropped rapidly during late December 2021 and early January 2022 when COVID-19 cases surged to the highest levels of the pandemic in the Bay Area due in large part to the more contagious Omicron variant. Since then, ridership has continued to slowly recover.

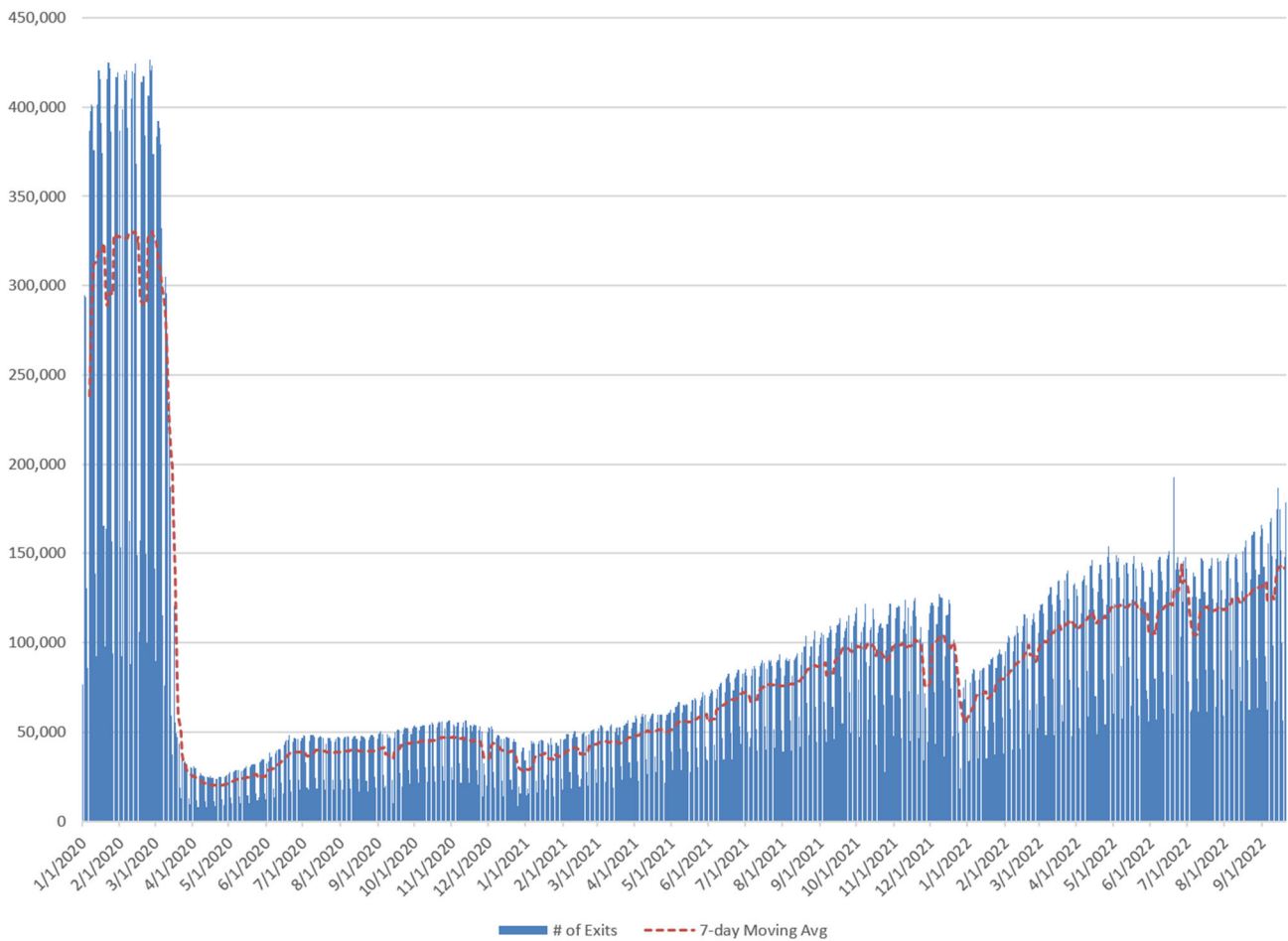


Figure 2-2 BART Ridership throughout the Pandemic

Total ridership for FY22 was 34.5M, approximately 29% of FY19 levels. For FY23, ridership is budgeted at 52.9M, approximately 45% of FY19 levels.

Figure 2-3 includes relative percentages of trips by geography for weekdays, which have remained relatively stable across FY19 and FY22. The largest change is in average weekday Transbay trips, which declined from a 55% share of average weekday trips in FY19 to 50% of average weekday trips in FY22.

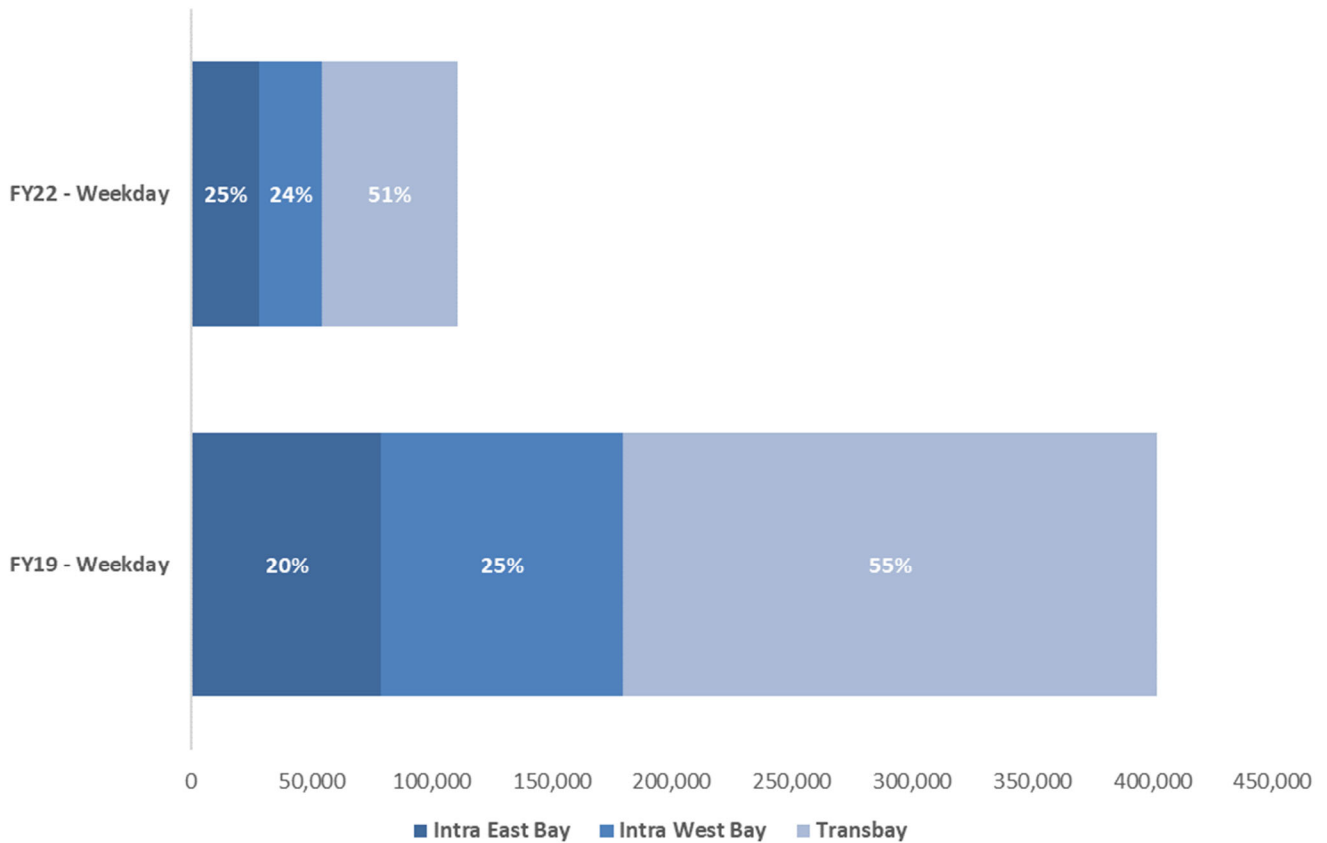


Figure 2-3 Average Weekday Ridership by Geography FY19 to FY22

Figure 2-4 provides additional perspective regarding how ridership declined across weekday service hours from FY19 to FY22. While both FY19 and FY22 exhibit 8:00 am and 5:00 pm peaks, the relative magnitude of FY19’s weekday peaks are much more pronounced than FY22’s. For example, FY19 average total weekday ridership at 8 AM and 5 PM was about 4 times greater than noon ridership, while FY22 average total weekday ridership at 8 AM and 5 PM was about 2.5 times greater than noon ridership.

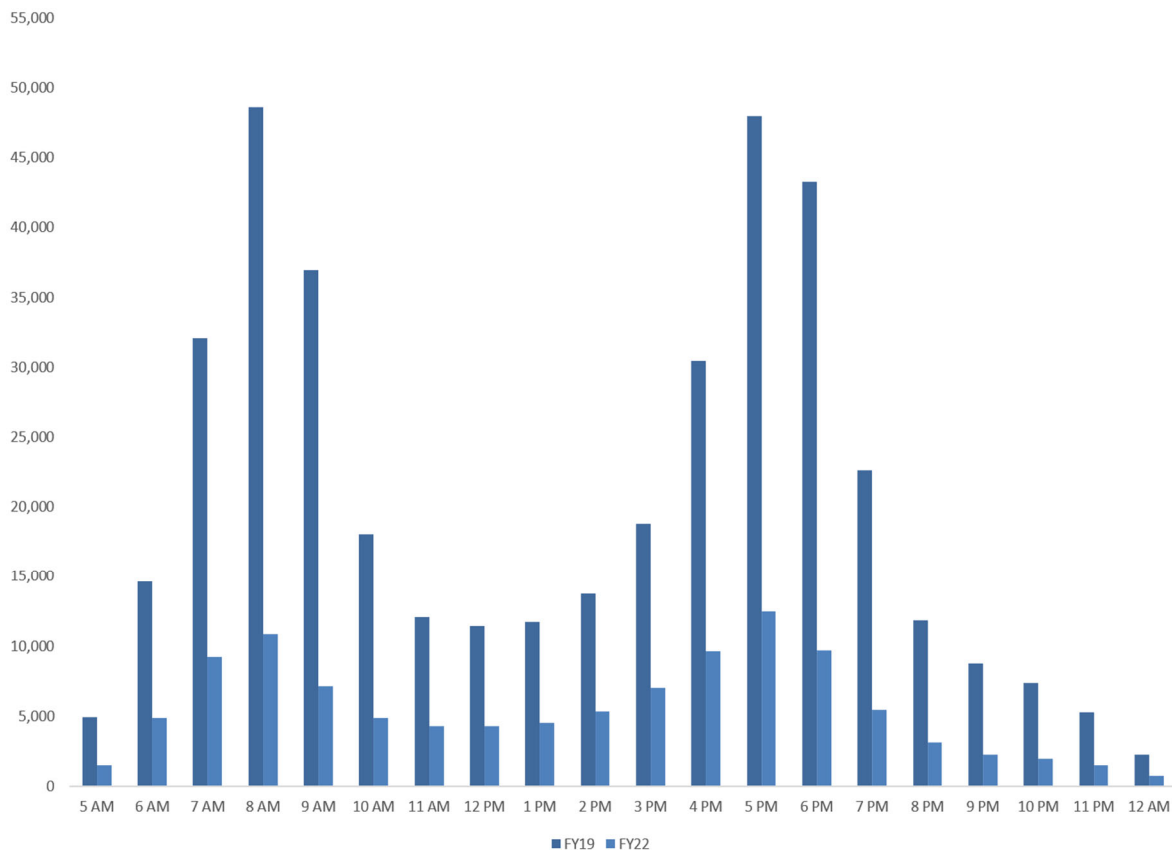


Figure 2-4 Average Total Weekday Ridership per Hour – FY19 and FY22

Table 2-3 lists the top 10 stations by total exits in FY19 and FY22 respectively. The arrows between FY19 and FY22 indicate relative movement in ranking between stations. Nine of the top 10 stations remain the same across from FY19 to FY22. Downtown San Francisco stations (Embarcadero, Montgomery Street, Powell Street and Civic Center/UN Plaza) remain the top four stations in terms of total ridership, but Powell and Montgomery swapped second place and third place. Embarcadero and Montgomery each registered approximately ten million total fewer exits in FY22 than FY19. Balboa Park dropped from tenth most exits in FY19 to twelfth most exits in FY22, while Fruitvale rose from fourteenth most exits in FY19 to eighth most exits in FY22.

Table 2-3 Top 10 Stations Ranked by Total Exits in FY19 and FY22

| FY2019 | | | FY2022 | |
|-------------------------|-------------|---|-------------------------|-------------|
| Exit Station | Total Exits | | Exit Station | Total Exits |
| Embarcadero | 13,443,726 | → | Embarcadero | 3,021,831 |
| Montgomery Street | 12,439,438 | → | Powell Street | 2,630,358 |
| Powell Street | 8,327,435 | → | Montgomery Street | 2,573,714 |
| Civic Center / UN Plaza | 6,628,170 | → | Civic Center / UN Plaza | 1,962,660 |
| 12th Street Oakland | 3,881,661 | → | 16th Street Mission | 1,313,943 |
| 16th Street Mission | 3,780,923 | → | 24th Street Mission | 1,277,526 |
| 19th Street Oakland | 3,771,900 | → | Downtown Berkeley | 1,169,968 |
| 24th Street Mission | 3,641,031 | → | Fruitvale | 952,528 |
| Downtown Berkeley | 3,473,972 | → | 12th Street Oakland | 937,987 |
| Balboa Park | 2,984,679 | → | 19th Street Oakland | 890,232 |

A 2018 Customer Satisfaction Survey indicated that the top two primary BART rider trip purposes were "Commute" (70%) and "Visit friends/family" (7%) across all days. The same survey conducted during the pandemic in October 2020 indicated that "Commute" trips constituted 64% of primary trip purposes and "Visit friends/family" constituted 13%. For weekdays only, the top two primary purposes remained the same and exhibited a nearly identical nominal decrease in "Commute" and increase in "Visit friends/family" from 2018 to 2020. For weekends only, "Commute" and "Visit friends/family" were also the top two weekend primary trip responses for both 2018 and 2020. Increases in "Commute" and "Visit Friends/family" primary trip purposes from 2018 to 2020 appear to be driven by decreases in "School", "Airplane trip" and "Restaurant" primary trip purposes. **Table 2-4** summarizes these dynamics.

Table 2-4 Fall 2018 to Fall 2020 BART Rider Trip Purpose Comparison

| Day Type | % of Primary Trip Purpose Responses | | | |
|----------|-------------------------------------|-----------|----------------------------|-----------|
| | "Commute" | | "Visit Friends and Family" | |
| | Fall 2018 | Fall 2020 | Fall 2018 | Fall 2020 |
| All Days | 70% | 64% | 7% | 13% |
| Weekday | 77% | 70% | 4% | 10% |
| Weekend | 24% | 35% | 24% | 30% |

2.4 How have equity priority communities been considered in service planning or changes?

In early 2020, despite a severe fiscal crisis and overall ridership that fell to just 6% of pre-pandemic levels, BART maintained 60% of pre-pandemic service to ensure basic mobility for essential workers and transit-dependent riders.

Beginning in 2021, BART began to restore service as quickly as feasible, with a focus on ensuring adequate span of service and frequency outside of traditional 9-5 commute periods. In August 2021, 5-line service with 15-minute headways on each line were restored on weekdays and Saturdays and the span of service was extended until midnight. BART prioritized this change in order to meet the need for late-night transit connectivity for service industry workers in downtown San Francisco. As of February 2022, Sunday service was significantly improved by running new 5-line service for the first time in BART's history (instead of 3-line service) and restoring service to midnight. Total service hours now exceed 2019 levels.

2.5 How has the operating budget changed?

Table 2-5 summarizes the FY19 actual operating financials and the FY23 operating budget. In FY19, operating revenue funded approximately 60% of BART's operations. Lower ridership has reduced operating revenues for the FY23 budget by approximately \$300M, and operating revenue now accounts for about 25% of expense. Financial assistance has increased between the two time periods, with budgeted increases in sales and property tax, as well as the addition of VTA's subsidy for BART Silicon Valley operations. Operating expense has increased by approximately \$102 million from FY19 Actuals to FY23 Budget, accounting for the opening of the BART Silicon Valley extension as well as increases in service delivered, labor, benefits, power, and materials costs. Given the reduction in revenue and increase in expense, the use of emergency federal assistance funding has been critical to BART's continued operation through FY22.

Table 2-5 Comparison of FY19 Actuals to FY23 Budget

| \$ millions | FY 2018-19 Actuals | FY 2022-23 Budget | Difference | % |
|------------------------------|--------------------|-------------------|------------|-----------|
| Operating Revenue | 558 | 255 | -303 | -54% |
| Financial Assistance | 394 | 449 | 54 | 14% |
| Emergency Federal Assistance | 0 | 314 | 314 | n/a |
| Total Sources | 953 | 1,017 | 65 | 7% |
| Operating Expense | 758 | 860 | 102 | 13% |
| Debt Service & Allocations | 194 | 157 | -37 | -19% |
| Total Uses | 953 | 1,017 | 65 | 7% |

3 Scenario Planning Concepts: FY24 through FY28

3.1 Methodology

Baseline Operating Forecast

BART maintains a financial operating forecast (“Baseline Forecast”) that includes estimates of all operating sources and uses over the next 10 years. Over the FY24-FY28 timeframe for the Reimagined SRTP, the Baseline Forecast assumes current service levels from FY24-FY27. In FY28, service is planned to be augmented with the completion of the Core Capacity Project, which increases the frequency of trains across the system.

The Reimagined SRTP guidelines specify that operating expense and revenue expended on operations are as defined for the Federal Transit Administration’s National Transit Database (“NTD”) reporting purpose, which excludes several categories of expense in BART’s operating program. The following categories of expenses, which are typically included in BART’s operating budget, must be excluded to reach consistency with NTD:

- Operating Allocations
- Capital Allocations
- Bond Debt Service
- Operating Leases
- Interest Expenses
- Paid Portion of Liability for Past Service Cost

VTA reimburses BART for the net cost of operations within Santa Clara County. In BART’s budget, the cost of Santa Clara service is recognized as operating expense, and VTA’s net reimbursement for those costs is counted as revenue. For the Reimagined SRTP exercise, revenues do not include the VTA reimbursement, so the operating cost of the extension was removed from the operating expense for consistency.

Finally, the expense of the FY28 Core Capacity service increase was removed so that the baseline represented continuation of current service levels. The results are the MTC-Consistent Baseline Operating Expense under the Baseline Forecast, presented in **Table 3-1**.

Table 3-1 Development of MTC-Consistent Baseline Operating Expense Forecasts

| \$M | FY24 | FY25 | FY26 | FY27 | FY28 |
|--|------------|------------|------------|------------|------------|
| Baseline Forecast Uses | 1,096 | 1,113 | 1,130 | 1,153 | 1,253 |
| - NTD OpEx Exclusions | 132 | 130 | 124 | 125 | 123 |
| - Bond Debt Service and Allocations | 187 | 166 | 170 | 174 | 160 |
| - VTA Operating Expense | 39 | 40 | 41 | 42 | 47 |
| - Core Capacity Service | 0 | 0 | 0 | 0 | 89 |
| MTC-Consistent Baseline Operating Expense | 738 | 777 | 796 | 813 | 834 |

Service Scenario Costing

Initial operating cost estimates for the service scenarios were developed using the BART Operating and Maintenance Cost Model (“O&M Cost Model”), a tool used to compute districtwide costs based on the following annual service statistics:

- Linked Passenger Trips
- Peak Vehicles
- Fleet Vehicles
- Peak Trains
- Total Car-Miles
- Total Car-Hours
- Total Train-Hours
- Revenue Route Miles
- Total Stations
- Station Hours
- Station Days
- Parking Spaces
- Report Locations for Service & Inspection Yards, Maintenance and Engineering Facilities, Transportation Staff, and Police Staff

The FY23 Adopted Budget service plan statistics are calibrated to the FY23 Adopted Budget operating expense to arrive at unit costs for each cost driver. For a new service scenario, the unit costs are then multiplied against the new service statistics and compiled to an annual operating expense for the scenario. Future year costs are escalated using a series of assumptions based on cost category. The main escalation drivers are labor increases (contractual wage increases are used when available), actuarial forecasts, and general inflation. Model estimates were adjusted based on more detailed analysis from Energy and Rolling Stock & Shops.

The Operations Planning department provided operating statistics for several tiers of lower-than-Baseline Forecast service. These service tiers were run through the O&M Cost Model, and the cost delta between the scenario expense and Baseline Forecast expense constituted the dollar amount of savings. These service tiers were then iterated upon to get the savings amount as close as possible to the deficit. BART considered being within \$10M of closing the annual deficit to be an acceptable variance, as a deficit of this magnitude could be closed by means other than reducing service.

The next three sub-sections provide an overview on each of the MTC-required Scenarios.

3.2 Robust Recovery

Netting the Robust Recovery revenue envelope against the MTC-Consistent Operating Expense forecast yields the annual deficits, shown in **Table 3-2**.

Table 3-2 Robust Recovery Annual Deficits

| \$M | FY24 | FY25 | FY26 | FY27 | FY28 | 5-yr Average |
|---|------------|------------|------------|------------|------------|--------------|
| Robust Recovery MTC Scenario Revenue | 750 | 767 | 784 | 801 | 819 | 784 |
| MTC-Consistent Baseline Operating Expense | 738 | 777 | 796 | 813 | 834 | 792 |
| Operating Result | +12 | -10 | -12 | -12 | -16 | -8 |

The Robust Recovery revenue scenario yields an average annual deficit of \$8M, within the range of acceptable variance. Service across the study period would be identical to what is run today, summarized in **Table 2-2**. Key operating metrics for the Robust Recovery service plan are presented in **Table 3-3**, along with the Some Progress and Fewer Riders service plan metrics for ease of comparison.

Table 3-3 Key Operating Metrics for Baseline and MTC Scenario Service Plans

| Operating Metric | Baseline / Robust Recovery | Some Progress | Fewer Riders |
|---|----------------------------|---------------|--------------|
| Total Peak Vehicle Requirement ¹ | 636 | 301 | 222 |
| Peak Period Trains ¹ | 67 | 30 | 22 |
| Total Annual Car Hours (million) | 2.9 | 1.2 | 0.5 |
| Total Annual Car Miles (million) | 93.0 | 35.2 | 12.7 |
| Total Stations | 50 | 50 | 41 |
| Notes: 1. Includes ready reserve and training cars | | | |

3.3 Some Progress

Netting the Some Progress revenue envelope against the MTC-Consistent Operating Expense forecast yields the annual deficits, shown in **Table 3-4**.

Table 3-4 Some Progress Revenue Scenario with Baseline Operating Expense

| \$M | FY24 | FY25 | FY26 | FY27 | FY28 | 5-yr Average |
|---|-------------|-------------|-------------|-------------|-------------|--------------|
| MTC-Consistent Baseline Operating Expense | 738 | 777 | 796 | 813 | 834 | 792 |
| Some Progress MTC Scenario Revenue | 638 | 652 | 666 | 681 | 696 | 667 |
| Operating Result | -100 | -125 | -130 | -132 | -138 | -125 |

This scenario requires deep service cuts in order to close the \$125M average annual deficit over the study period. To achieve this level of savings, service hours would be reduced to end service at 9 pm on all days of the week. It would operate 3-line service at 30 minute headways throughout the entire service period on all days of the week. This reduced service plan is summarized in **Table 3-5**.

Table 3-5 Some Progress Service Plan

| Day of Week | Hours of Service | Headways (min) | Routes in Service | | | | |
|-------------|-------------------|----------------|-------------------|---|---|---|---|
| | | | ■ | ■ | ■ | ■ | ■ |
| Weekdays | 5:00 AM – 9:00 PM | 30 | ■ | ■ | ■ | | |
| Saturday | 6:00 AM – 9:00 PM | 30 | ■ | ■ | ■ | | |
| Sunday | 8:00 AM – 9:00 PM | 30 | ■ | ■ | ■ | | |

Annualized key operating metrics for the Some Progress service plan are presented in **Table 3-3**, along with the Baseline and Fewer Riders service plan metrics for ease of comparison.

The resulting operating expense under the Some Progress service plan is presented in **Table 3-6**, along with the new operating result calculated against the revenue envelope. The result is an average annual surplus of \$14M over the five-year study period.

Table 3-6 Some Progress Revenue Scenario with Some Progress Service Plan Operating Expense

| \$M | FY24 | FY25 | FY26 | FY27 | FY28 | 5-yr Average |
|--|------------|------------|------------|------------|-----------|--------------|
| Some Progress MTC Scenario Revenue | 638 | 652 | 666 | 681 | 696 | 667 |
| Some Progress Service Plan Operating Expense | 609 | 640 | 656 | 670 | 687 | 652 |
| Operating Result with Reduced Service | +29 | +12 | +10 | +11 | +9 | +14 |

Discussion

The above cost analysis addresses the first order impact by reducing service and cost to meet the reduced revenue target. However, there would be a second order impact: the service reduction would result in lower ridership whether due to capacity constraints, cancelled service hours, or uncompetitive travel times. Lower ridership would further reduce operating revenues, requiring further service and cost reductions.

Under the Some Progress scenario, the implied ridership level is approximately 365K average weekday trips. BART conducted a capacity analysis to discover if this level of ridership could be served under the Some Progress service plan. As discussed in **Sections 1.3** and **2.3**, weekday ridership, under both pre-pandemic and current conditions, exhibits a dual peaking pattern. This weekday pattern is expected to persist under the Some Progress conditions.

For this analysis we have assumed that the maximum capacity of a BART car is 160 passengers, well above FTA load factor standards. The capacity analysis shows that the level of service provided could not serve the demand, especially during the AM and PM peak periods and during the late evening when there is no service. See **Figure 3-1** for the projected demand throughout the average weekday and the demand actually served by the service provided.

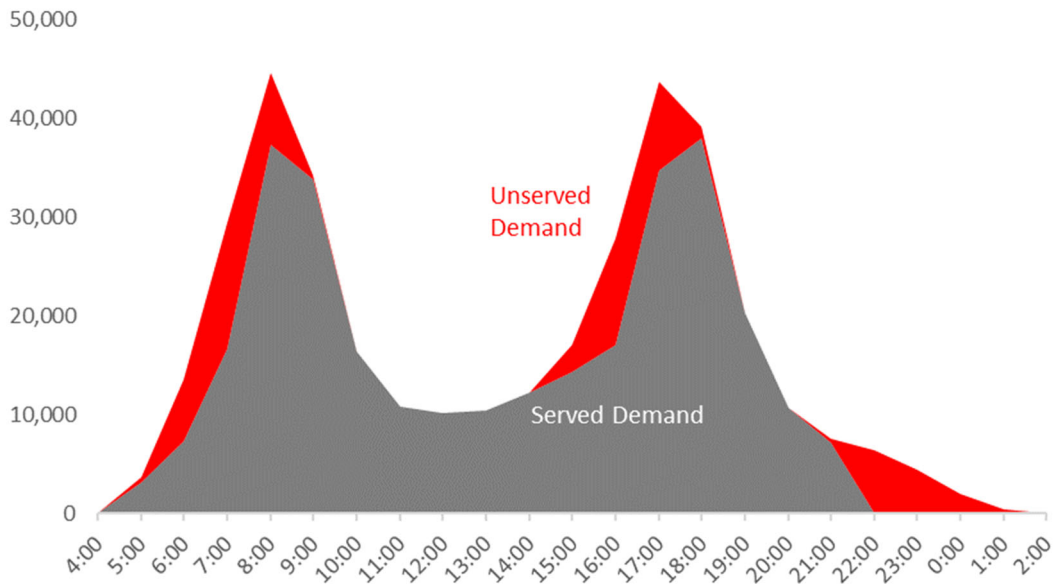


Figure 3-1 Revenue Recovery, with Fewer Riders: Weekday Demand vs Served Demand

The capacity analysis shows that out of the ~365K average weekday trips, about ~65K would not be able to board a train due to capacity constraints or cancelled late night service. Annually, this is estimated at approximately 17M fewer trips than scenario implies. With net average fare modeled at ~\$4.50 across the study period, the weekday impact to fare revenue would be approximately \$77M per year.

The reduction of late-night service on the weekends would also impact demand served at a smaller scale.

Even without the revenue quantification of lost weekend trips, the estimated weekday fare revenue loss of ~\$77M would reduce operating revenue levels that are nearing the Fewer Riders scenario. Even if BART were able to cut even more service to close this new operating deficit, even less ridership could be served, again decreasing fare revenue.

For the rider, this service scenario would result in far less useful transportation service and a diminished riding experience. In total, trains serving each line would arrive half as often as they do today. The reduction from 5- to 3-line would mean even longer wait times at many stations, and more trips would require transfers between lines. The early closing time would mean riders could not make evening work- or non-work trips using BART. There would be high degrees of crowding on trains and platforms at the peak periods, as shown in the capacity analysis.

3.4 Fewer Riders

Netting the Fewer Riders revenue envelope against the MTC-Consistent Baseline Operating Expense forecast yields the annual deficits, shown in **Table 3-7**.

Table 3-7 Fewer Riders Revenue Scenario with Baseline Operating Expense

| \$M | FY24 | FY25 | FY26 | FY27 | FY28 | 5-yr Average |
|---|-------------|-------------|-------------|-------------|-------------|--------------|
| Fewer Riders MTC Scenario Revenue | 535 | 547 | 559 | 571 | 584 | 559 |
| MTC-Consistent Baseline Operating Expense | 738 | 777 | 796 | 813 | 834 | 792 |
| Operating Result with Baseline Service | -203 | -230 | -237 | -242 | -250 | -233 |

This scenario requires extremely deep cuts to service in order to close the \$233M average annual gap over the study period. Under this scenario, service would operate only on weekdays between 5:00 am and 9:00 pm. It would operate on 3-lines at 60 minute headways. Service would not run on the weekends. Yellow line service would terminate at Pittsburg / Bay Point Station and nine stations would be closed. Note that the cost model assumes that station closures would save expense on transportation-related costs (e.g. station agents), but infrastructure maintenance would still be required.

The reduced service plan summarized in **Table 3-8** could be operated within the Fewer Riders revenue envelope.

Table 3-8 Revenue Recovery, with Fewer Riders Service Plan

| Day of Week | Hours of Service | Headways (min) | Routes in Service | | | | |
|--|-------------------|----------------|-------------------|---|---|---|---|
| | | | ■ | ■ | ■ | ■ | ■ |
| Weekdays | 5:00 AM – 9:00 PM | 60 | ■ ¹ | ■ | ■ | | |
| Saturday | – | – | | | | | |
| Sunday | – | – | | | | | |
| Notes: | | | | | | | |
| 1. Yellow line service terminates at Pittsburg/Bay Point Station | | | | | | | |

Annualized key operating metrics for the Fewer Riders scenario are presented in **Table 3-3**, along with the Baseline and Some Progress metrics for ease of comparison.

The resulting operating expense under the Fewer Riders service plan is presented in **Table 3-9**, with the new operating result calculated against the revenue envelope. The result is a balanced operating result over the five-year study period.

Table 3-9 Fewer Riders Revenue Scenario with Fewer Riders Service Plan Operating Expense

| \$M | FY24 | FY25 | FY26 | FY27 | FY28 | 5-yr Average |
|--|------------|-----------|-----------|-----------|-----------|--------------|
| Revenue Recovery, with Fewer Riders MTC Scenario Revenue | 535 | 547 | 559 | 571 | 584 | 559 |
| Revenue Recovery, with Fewer Riders Service Plan Operating Expense | 521 | 550 | 563 | 574 | 588 | 559 |
| Operating Result with Reduced Service | +14 | -3 | -4 | -3 | -4 | 0 |

Discussion

The above cost analysis addresses the first order impact by reducing service and cost to meet the reduced revenue target. However, there would be a second order impact: the service reduction would result in lower ridership whether due to capacity constraints, cancelled service hours, or uncompetitive travel times. Lower ridership would further reduce operating revenues, requiring further service and cost reductions.

Under the Fewer Riders scenario, the implied ridership level is approximately 255K average weekday trips. BART conducted a capacity analysis to discover if this level of ridership could be served under the Fewer Riders service plan. As discussed in **Sections 1.3** and **2.3**, weekday ridership, under both pre-pandemic and current conditions, exhibits a dual peaking pattern. This weekday pattern is assumed to persist under the Fewer Riders conditions. The capacity analysis shows that the level of service provided could not serve the demand, especially during the AM and PM peak periods and during the late evening when there is no service. See **Figure 3-2** for the projected demand throughout the average weekday and the demand actually served by the service provided.

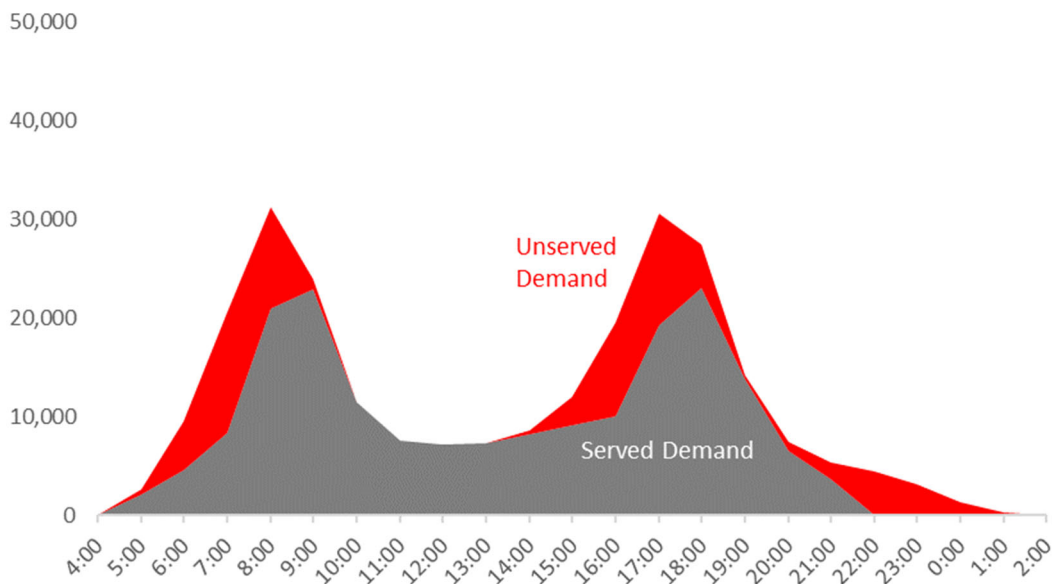


Figure 3-2 Fewer Riders: Weekday Demand vs Served Demand

The capacity analysis shows that out of the ~255K average weekday trips, about ~70K would not be able to board a train due to capacity constraints or cancelled late night service. Annually, this is estimated at approximately 18M fewer trips than

forecast. With net average fare modeled at ~\$4.50 across the study period, the weekday impact to fare revenue would be approximately \$82M per year. Note that the unserved demand estimate is conservative; due to technical limitations of the capacity model, 5-line service was modeled rather than the 3-line service proposed.

Additionally, this service plan does not include weekend service. A conservative estimate of weekend trips results in average Saturday at ~100K and Sunday at ~70K trips. With the cancellation of weekend service under this scenario, BART would be forgoing ~170K trips per week, or approximately 8.9 million trips per year. With net average fare modeled at ~\$4.50 across the study period, this forgone fare revenue would be about \$40M per year.

This conservative estimate of fare revenue loss due to capacity constraints and cancelled service hours yields an average annual reduction of ~\$120M per year. Even if BART were able to cut even more service to close the operating deficit under the Fewer Riders scenario, even less ridership could be served, again decreasing fare revenue.

For the regular rider, this level of service would be an extreme downgrade of rider experience. Hourly headways would make BART a non-competitive option for most types of trips, while major crowding would occur during peak times. The reduction from 5- to 3-line service would mean more trips would require transfers. The early closing time and lack of weekend service would severely limit the usefulness BART for work- and non-work trips. The closure of nine stations would reduce access to the destinations throughout the region.