



TECHNICAL MEMORANDUM

DATE: April 23, 2026
TO: Michael Muller, Massachusetts Bay Transportation Authority
FROM: Sophie Fox and Rosemary McCarron, Boston Region Metropolitan Planning Organization Staff
RE: 2025 South Coast Rail Service Equity Analysis

When introducing a new service, the Massachusetts Bay Transportation Authority (MBTA) evaluates the equity impacts of the proposed service changes. At the request of the MBTA, the Central Transportation Planning Staff (CTPS), which serves as staff to the Boston Region Metropolitan Planning Organization (MPO), examined the equity impacts of the new South Coast Rail project.

The South Coast Rail project extended the existing Middleborough Line and introduced six new commuter rail stations to Taunton, Fall River, and New Bedford:

- Middleborough, which replaces the Middleborough/Lakeville Station on the Middleborough Line
- East Taunton
- Freetown
- Fall River Depot
- Church Street
- New Bedford¹

As a recipient of federal funds, the MBTA is subject to Title VI of the Civil Rights Act of 1964, which protects people from discrimination based on race, color, and national origin. The MBTA's Service and Fare Change Equity Policy documents how the agency evaluates the impacts of proposed fare and major service changes on low-income populations and populations protected on the basis of race or ethnicity relative to other groups in compliance with the Federal Transit Administration's (FTA) Title VI Circular 4702.1B.

This document fulfills the MBTA's responsibility to conduct a service equity analysis, as required by Title VI. The objective of this analysis was to determine if

¹ Massachusetts Bay Transportation Authority, "South Coast Rail."
<https://www.mbta.com/projects/south-coast-rail>

the addition of new commuter rail service would result in disparate impacts for populations protected on the basis of race or ethnicity or disproportionate burdens for low-income populations. CTPS compared the impacts of the service change on revenue-vehicle hours (RVH) and service coverage on populations classified as protected on the basis of race or ethnicity and classified as low-income. CTPS applied the MBTA's disparate-impact and disproportionate-burden policies. Based on this analysis, the introduction of the Fall River/New Bedford commuter rail line provides a greater benefit to non-protected populations than protected populations as measured by RVH. There was no disproportionate burden identified for low-income populations.

1 REQUIREMENTS

Title VI of the Civil Rights Act of 1964 prohibits discrimination, either intentionally or unintentionally, by recipients of federal financial assistance based on race, color, or national origin. To comply with Title 49 of the Code of Federal Regulations (CFR) Section 21.5(b) (2), 49 CFR Section 21.5(b) (7), and Appendix C to 49 CFR Part 21, the MBTA must evaluate any and all service changes that exceed the transit provider's major service change threshold to determine if the proposed changes would have a discriminatory effect.

The FTA provides guidance for conducting service equity analyses in FTA Circular 4702.1B, Section IV.7.a. The MBTA must analyze available information to understand whether populations protected on the basis of race or ethnicity and/or low-income populations would be disproportionately affected by the service change. In addition, the MBTA must describe the datasets and collection methods used in its analysis.

Under Title VI and other directives, the FTA requires that transit agencies develop a policy to assess whether a major service change would have a disparate impact on protected populations or disproportionate burden on low-income populations. The FTA Title VI guidelines define disparate impact as "a facially neutral policy or practice that disproportionately affects members of a group identified by race, color, or national origin, where the recipient's policy or practice lacks a substantial legitimate justification and where there exists one or more alternatives that would serve the same legitimate objectives, but with less disproportionate effects on the basis, of race, color, or national origin."² The guidelines define disproportionate burden as "a neutral policy or practice that disproportionately affects low-income populations more than non-low-income populations."

² Federal Transit Administration, "Title VI Requirements and Guidelines for Federal Transit Administration Recipients." FTA Circular 4702.1B (2012).
https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/FTA_Title_VI_FINAL.pdf

2 MBTA SERVICE AND FARE CHANGE EQUITY POLICY

2.1 Policy Thresholds

For service equity analyses, the MBTA evaluates the change in RVH and/or base coverage, defined as the percent of the population that lives within 0.5 miles of an MBTA stop or station. The MBTA Service and Fare Change Equity Policy explains the methodology to be used for service equity analyses.³

According to the policy, “The MBTA defines a Major Service Change as any addition, reduction, suspension or change in service lasting longer than 12 months consecutive and meeting one or more of the following criteria:

- A change of at least 10% in Revenue Vehicle Hours (RVH) per week by mode;
- A change of at least 25% in RVH per week by route; or
- A change of at least 0.30% of the population covered by the entire network according to the base coverage standard established in the MBTA’s Service Delivery Policy.”

For a major service change, a disparate impact would be found if:

$$\text{Percent change in weekly RVH or base coverage for the protected population} < 80\% \times \text{Percent change in weekly RVH or base coverage for the non-protected population}$$

A disproportionate burden would be found if:

$$\text{Percent change in weekly RVH or base coverage for the low-income population} < 80\% \times \text{Percent change in weekly RVH or base coverage for the non-low-income population}$$

The Service and Fare Change Equity Policy also describes the steps the MBTA will take when disparate impacts or disproportionate burdens are identified.

3 ANALYSIS

This analysis follows the guidelines outlined in the MBTA Service and Fare Change Equity Policy to determine whether the new commuter rail service

³ Massachusetts Bay Transportation Authority, “MBTA Service and Fare Change Equity Policy” (2023). <https://cdn.mbta.com/sites/default/files/2023-10/2023-10-Service-Fare-Change-Equity-Policy-English-Accessible.pdf>

introduces adverse effects that will have a disparate impact or disproportionate burden on protected populations.

3.1 Data

In this analysis, CTPS primarily used the General Transit Feed Specification (GTFS) pre-rating recap files published by the MBTA for fall 2024 and 2025, using typical weekday, Saturday, and Sunday schedules.⁴ From the GTFS data, we identified the two scenarios to compare for the service equity analysis.

Baseline Scenario—Middleborough Service

For the baseline scenario, we curated a list of MBTA trips and stop times for a typical weekday, Saturday, and Sunday in fall 2025. These data were filtered to remove any trips that are part of the Fall River/New Bedford commuter rail line. The fall 2024 Middleborough Line trips and stop times were added to this dataset.

Build Scenario—Fall River/New Bedford Service

For the build scenario, the list of MBTA trips and stop times is unedited from the initial fall 2025 schedule. It does not include the Middleborough Line trips present in the baseline scenario.

Additional Data

Demographics were calculated at the census tract level with US Census Data.⁵ Low-income populations were defined in the service equity policy as those in which the median household income is less than 80 percent of the median household income for the MBTA service area (approximately \$82,000).

Table 1 below shows the increase in the population that has access to the service as a result of the South Coast Rail project compared to the overall demographics of the twenty municipalities impacted by the increased service.

⁴ MBTA Office of Performance Management and Innovation (OPMI), “GTFS Pre-Rating Recaps.” <https://mbta-massdot.opendata.arcgis.com/datasets/9ab1dc7ea2bf4ad7b7e25cc6b941b39a/about>

⁵ US Census Bureau, “2020 United States Decennial Census” (2021); US Census Bureau, “2020–2024 American Community Survey (ACS) 5-Year Estimates” (2024).

**Table 1
Change in Access: Baseline vs. Build Scenario**

Population Group	Population of Impacted Municipalities (thousands)	New population with access after South Coast Rail (thousands)
Protected	111.2	87.5
Non-Protected	374.6	225.5
Low-Income	102.3	75.2
Non-Low-Income	98.5	56.3

Low-income households are those with an annual income of less than \$82,000.

Sources: MBTA schedule files as processed by CTPS and 2020 US Census and 2020-24 American Community Survey.

3.2 Major Service Change

Major Service Change Methods

The following steps detail the methodology for determining whether introduction of the new service meets the definition of a major service change:

1. Calculate the study area for base coverage by generating a half-mile walkshed around each stop in the fall 2025 GTFS schedule using the Open Street Map (OSM) walking network.
2. Calculate the study area for RVH by creating circular buffers of various radii around each stop. The buffer radius for a stop is determined by the type of stop/station, its location in the region, and other characteristics provided by the MBTA. Table 2 details the buffer radius for each stop or station in the MBTA system.

**Table 2
Buffer Radii for each MBTA Stop/Station**

Buffer Radius (miles)	Type of Stop
0.25	Logan Airport and Georges Island ferry stops
0.5	Local bus, downtown express bus, rapid transit (including Silver Line), most of the ferry stops surrounding Boston, and commuter rail stations in Zone 1A
1.5	Winthrop and Quincy ferry stops
3	Non-terminal commuter rail stops outside of Zone 1A.
5	Terminal commuter rail stops outside of Zone 1A and the Lynn, Hingham, and Hull ferry stops

Note: CapeFLYER stations are not included in this analysis.

3. For the baseline and build scenarios, extract the route, trip, and stop information from the GTFS file for the study areas for each metric.
 - a. According to the policy, to identify a major service change, the coverage metric only considers stops served by the MBTA and excludes stops in municipalities served by regional transit authorities (RTAs). All of the new stations are in municipalities served by RTAs and thus fall outside of the coverage area as defined by the policy. For this reason, we used both the policy definition and the MBTA’s extended service area to evaluate the change in coverage.
 - b. The RVH metric considers all MBTA stops in the GTFS schedule.
4. Calculate the change in RVH by mode and by route. Calculate the change in coverage for the total population in the study area. Base coverage is defined as the percent of the total population in the non-RTA municipalities that live within 0.5 miles of an MBTA stop or station.

Major Service Change Determination

The results of the major service change determination are shown in Table 3.

Table 3
Major Service Change Determination

Metric	Threshold	Result	Change
Mode-level RVH	10%	Commuter rail service increased by 6.5%	No major service change
Route-level RVH	25%	113% increase in RVH for the Middleborough and Fall River/New Bedford Lines	Major service change
Coverage	0.3%	Overall coverage increased by 0.02%	No major service change

RVH = revenue-vehicle hours.

Sources: MBTA schedule files as processed by CTPS and 2020 US Census and 2020-24 American Community Survey.

To measure the change in route-level RVH, we compared service on the 2024 Middleborough commuter rail line to the 2025 Fall River/New Bedford commuter rail line. The South Coast Rail project increased route-level RVH by more than 113 percent, which well exceeds the route-level major service change threshold.

The set of municipalities included in the policy’s definition of base coverage area does not include any municipalities that contain any of the stations on the Fall River/New Bedford Line. As a result, there is no change in coverage using this definition. As a supplementary analysis, we expanded the base coverage area to include all municipalities in the core and expanded MBTA service area. When repeating the analysis for the extended service area, the percent of the population that is covered by MBTA service increases by 0.2 percent. In both cases, the change in service area coverage due to the project does meet the threshold for a major service change.

Because the South Coast Rail project met the route-level threshold for a major service change, we completed a service equity analysis of RVH.

3.3 Disparate Impact/Disproportionate Burden Evaluation

Equity ratios for the change in RVH were calculated to determine if the South Coast Rail project introduces inequity into the system.

RVH Methods

The following steps detail the methodology for calculating disparate impact and disproportionate burden ratios for RVH:

1. For each tract in the RVH study area, find the protected and low-income populations and percentages.
 - a. “Percent protected” is defined as the percent of individuals in a census tract who report as not being “White alone, not Hispanic or Latino.”
 - b. “Percent low-income” is defined as the percent of occupied households that report an annual household income below \$82,000.

2. Assign portions of RVH to different population groups based on the percentage of each route’s buffer that is made up of each population.

3. Determine the percent change values for protected and non-protected populations. Calculate the disparate impact and disproportionate burden ratios from these values.

Change in Weekly Revenue-Vehicle Hours

The results of the RVH metric calculation are shown in Table 4.

**Table 4
Net Change in Weekly Revenue-Vehicle Hours by Population Group**

Population Group	Existing RVH (thousands)	Net Change in RVH (thousands)	Percent Change
Protected	26.7	0.071	0.27%
Non-Protected	27.2	0.136	0.50%
Low-Income	22.6	0.111	0.49%
Non-Low-Income	31.2	0.097	0.31%

Low-income households are those with an annual income of less than \$82,000.

RVH = revenue-vehicle hours.

Sources: MBTA schedule files as processed by CTPS and 2020 US Census and 2020-24 American Community Survey.

For protected versus non-protected populations:

$$\frac{\% \text{ change for protected population}}{\% \text{ change for non-protected population}} = \frac{0.27\%}{0.50\%} = 0.53 < 0.8$$

A ratio of 0.53 indicates that the service change introduces a disparate impact on populations protected on the basis of race or ethnicity.

For low-income versus non-low-income populations:

$$\frac{\% \text{ change for low-income population}}{\% \text{ change for non-low income population}} = \frac{0.49\%}{0.31\%} = 1.58 > 0.8$$

A ratio of 1.58 indicates that the service change does not introduce a disproportionate burden on low-income populations.

4 DISCUSSION

This analysis evaluated the introduction of new stations along the Fall River/New Bedford commuter rail line. The new service increases the MBTA service coverage by 0.02 percent and increases systemwide revenue-vehicle hours by 0.39 percent. These are very small changes to RVH and coverage. Though populations protected on the basis of race or ethnicity benefit from the additional service, the proportion of protected population in the new service area is smaller than the proportion of protected population in the systemwide service area. The South Coast Rail project results in more service for all residents of the service area. Based on the analysis laid out in the MBTA Service and Fare Change Equity Policy, however, the introduction of these new stations results in a change in RVH that amounts to a disparate impact for populations protected on the basis of race or ethnicity and a larger increase, or disproportionate benefit, for low-income populations.

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