



TECHNICAL MEMORANDUM

DATE: March 9, 2022
TO: Lynsey Heffernan and Steven Povich, Massachusetts Bay Transportation Authority
FROM: Emily Domanico, Central Transportation Planning Staff
Blake Acton, Central Transportation Planning Staff
Bradley Putnam, Central Transportation Planning Staff
RE: SFY 2023: Fare Equity Analysis Results

When considering changes to fares, the Massachusetts Bay Transportation Authority (MBTA) undertakes a process to evaluate the equity impacts of the proposed changes. The Central Transportation Planning Staff (CTPS), which serves as staff to the Boston Region Metropolitan Planning Organization (MPO), examined the equity impacts of the state fiscal year (SFY) 2023 fare and fare structure changes. CTPS used an agent-based ridership model based on the systemwide ridership survey accompanied by ad hoc analyses to estimate the effects of the fare changes (for further description see section 5.1).

This document fulfills the MBTA's responsibility to conduct a fare equity analysis, as required by Title VI of the Civil Rights Act of 1964 (Title VI). The objective of this analysis was to determine if the fare changes would result in disparate impacts for minority populations or disproportionate burdens for low-income populations. In this analysis, CTPS compared the impacts of relative fare changes between riders who are classified as minorities to all riders and between riders who are classified as low-income to all riders, using pre-pandemic ridership levels. CTPS applied the MBTA's disparate-impact and disproportionate-burden policies and found neither a disparate impact to minority riders nor a disproportionate burden to low-income riders.

1 FARE CHANGE PROPOSAL

The MBTA is planning the following changes to its fares and fare structure:

1. Make 5-day FlexPasses on commuter rail a permanent fare product¹
1. Reduce the price of a 1-Day LinkPass from \$12.75 to \$11.00
2. Introduce 7-day LinkPasses for reduced-fare riders for \$10.00
3. Introduce monthly passes for reduced-fare riders on commuter rail, express bus, and ferry services
4. Make reduced LinkPasses valid on commuter rail Zone 1A and Charlestown ferry
5. Change transfer rules to allow 1) a second free transfer on bus and subway, and 2) one free transfer between express buses

Overall, the proposed changes result in fare decreases for select pass travel. Additionally, the proposed changes expand the discounted fare products available to reduced-fare riders. As shown in Table 1A, the proposed fare changes affecting single-ride fares are due to the proposed transfer rules. Table 1B shows a list of existing and proposed fares for fare products along with the percentage change from existing to proposed price, including the new products offered with the proposed changes. For the full list of pass prices, see Appendix Table 8.

¹ The FlexPass was introduced on the mTicket app on July 1, 2020, as a promotional fare product. The FlexPass is a bundle of five 1-day passes for a 10 percent discount compared to standard round-trip commuter rail fares. It expires 30 days after its purchase date.

Table 1A
Key Single-Ride Prices: Existing and Proposed

Fare Product	Existing Fare	Proposed Fare	Absolute Change	Percent Change
<i>Bus and Rapid Transit</i>				
Local Bus	\$1.70	\$1.70	\$0.00	0%
Rapid Transit	\$2.40	\$2.40	\$0.00	0%
Express Bus	\$4.25	\$4.25	\$0.00	0%
Local Bus + Local Bus	\$1.70	\$1.70	\$0.00	0%
Local Bus + Rapid Transit	\$2.40	\$2.40	\$0.00	0%
Local Bus + Express Bus	\$4.25	\$4.25	\$0.00	0%
Express Bus + Express Bus	\$8.50	\$4.25	-\$4.25	-50%
Local Bus + Rapid Transit + Local Bus	\$2.40	\$2.40	\$0.00	0%
Local Bus + Local Bus + Rapid Transit	\$4.10	\$2.40	-\$1.70	-41%
Rapid Transit + Local Bus + Local Bus	\$4.10	\$2.40	-\$1.70	-41%
Local Bus + Local Bus + Local Bus	\$3.40	\$1.70	-\$1.70	-50%
Local Bus (Reduced)	\$0.85	\$0.85	\$0.00	0%
Rapid Transit (Reduced)	\$1.10	\$1.10	\$0.00	0%
Express Bus (Reduced)	\$2.10	\$2.10	\$0.00	0%
<i>Commuter Rail</i>				
Zone 1A–10	\$2.40–\$13.25	\$2.40–\$13.25	\$0.00	0%
Interzone 1–10	\$2.75–\$7.25	\$2.75–\$7.25	\$0.00	0%
Zone 1A–10 (Reduced)	\$1.10–\$6.50	\$1.10–\$6.50	\$0.00	0%
Interzone 1–10 (Reduced)	\$1.25–\$3.50	\$1.25–\$3.50	\$0.00	0%
<i>Ferry</i>				
Charlestown Ferry	\$3.70	\$3.70	\$0.00	0%
Hingham/Hull Ferry	\$9.75	\$9.75	\$0.00	0%
Charlestown Ferry (Reduced)	\$1.85	\$1.85	\$0.00	0%
Hingham/Hull Ferry (Reduced)	\$4.85	\$4.85	\$0.00	0%

Note: Key single ride prices for bus and rapid transit transfers included in the table reflect available transfers on CharlieCards.

Source: MBTA.

Table 1B
Pass Prices: Existing and Proposed

Fare Product	Existing Fare	Proposed Fare	Absolute Change	Percent Change
<i>Bus and Rapid Transit</i>				
1-Day LinkPass	\$12.75	\$11.00	-\$1.75	-14%
7-Day LinkPass	\$22.50	\$22.50	\$0.00	0%
Local Bus Pass	\$55.00	\$55.00	\$0.00	0%
Monthly LinkPass	\$90.00	\$90.00	\$0.00	0%
Monthly Express Bus Pass	\$136.00	\$136.00	\$0.00	0%
Monthly LinkPass (Reduced)	\$30.00	\$30.00	\$0.00	0%
7-Day LinkPass (Reduced)	Not offered	\$10.00		New Product
Express Bus Pass (Reduced)	Not offered	\$67.00		New Product
<i>Commuter Rail</i>				
Monthly Pass Zone 1A–10	\$90.00–\$426.00	\$90.00–\$426.00	\$0.00	0%
Monthly Pass Interzone 1–10	\$90.00–\$257.00	\$90.00–\$257.00	\$0.00	0%
mTicket Monthly Pass Zone 1A–10	\$80.00–\$416.00	\$80.00–\$416.00	\$0.00	0%
mTicket Monthly Pass Interzone 1–10	\$80.00–\$247.00	\$80.00–\$247.00	\$0.00	0%
Weekend Pass	\$10.00	\$10.00	\$0.00	0%
FlexPass Zone 1A–10	Promotional Product	\$21.60–\$119.25		New Product
FlexPass Interzone 1–10	Promotional Product	\$24.75–\$65.25		New Product
Monthly Pass Zone 1A–10 (Reduced)	Not Offered	\$30.00–\$209.00		New Product
Monthly Pass Interzone 1–10 (Reduced)	Not Offered	\$41.00–\$124.00		New Product
mTicket Monthly Pass Zone 1A–10 (Reduced)	Not Offered	\$30.00–\$204.00		New Product
mTicket Monthly Interzone 1–10 (Reduced)	Not Offered	\$36.00–\$119.00		New Product
FlexPass Zone 1A–10 (Reduced)	Not Offered	\$9.90–\$58.50		New Product
FlexPass Interzone 1–10 (Reduced)	Not Offered	\$11.25–\$31.50		New Product

Fare Product	Existing Fare	Proposed Fare	Absolute Change	Percent Change
<i>Ferry</i>				
Commuter Ferry Pass	\$329.00	\$329.00	\$0.00	0%
mTicket Charlestown Ferry Pass	\$80.00	\$80.00	\$0.00	0%
mTicket Commuter Ferry Pass	\$319.00	\$319.00	\$0.00	0%
Commuter Ferry Pass (Reduced)	Not Offered	\$164.00		New Product
mTicket Commuter Ferry Pass (Reduced)	Not Offered	\$159.00		New Product

Source: MBTA.

2 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 fare changes to fixed-route modes prior to implementation to determine if the proposed changes would have a discriminatory effect. The Federal Transit Administration (FTA) provides guidance for conducting fare equity analyses in FTA Circular 4702.1B (“Circular”), Section IV.7.b. Prior to a fare change, the MBTA must analyze any available information generated from ridership surveys that indicates whether minority and/or low-income riders would be disproportionately more likely than overall riders to use the mode of service, payment type, or payment media that would be subject to a fare change. In addition, the MBTA must describe the datasets and collection methods used in its analysis.

The Circular states that the transit provider shall

- determine the number and percentage of users of each fare media subject to change;
- review fares before and after the change;
- compare the relative cost burden impacts of the proposed fare change between minority and overall users for each fare media; and
- compare the relative cost burden impacts of the proposed fare change between low-income and overall users for each fare media.

Under Title VI and other directives, the FTA requires that transit agencies develop a policy to assess whether a proposed fare change would have a disparate impact on minority 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.” The guidelines define disproportionate burden as “a neutral policy or practice that disproportionately affects low-income populations more than non-low income populations.”

3 MBTA TITLE VI DISPARATE IMPACT/ DISPROPORTIONATE BURDEN POLICY

3.1 Policy Thresholds

The MBTA's January 30, 2017, Disparate Impact/Disproportionate Burden (DI/DB) Policy² explains the methodology to be used for fare equity analyses:

“For all fare changes, the MBTA will compare the percentage change in the average fare for minority and overall riders and for low-income and overall riders. For fare-type changes across all modes, the MBTA will assess whether minority and low-income customers are more likely to use the affected fare type or media than overall riders. Any or all proposed fare changes will be considered in the aggregate and results evaluated using the fare DI/DB threshold, below. The MBTA's threshold for determining when fare changes may result in disparate impacts or disproportionate burdens on minority or low-income populations, respectively, is 10%.”

MBTA Disparate Impact/Disproportionate Burden (DI/DB) Policy

The policy thresholds are encapsulated in the following equations. A disparate impact would be found if the average fare decrease for minorities is less than 90 percent of the average fare decrease for all riders, or if the average fare increase for minorities is greater than 110 percent of the average increase for all riders:

$$\begin{aligned} \text{Minority Average Fare Decrease} &< 90\% \times \text{All-Rider Average Fare Decrease} \\ \text{Minority Average Fare Increase} &> 110\% \times \text{All-Rider Average Fare Increase} \end{aligned}$$

A disproportionate burden would be found if the average fare decrease for low-income riders is less than 90 percent of the average fare decrease for all riders, or if the average fare increase for low-income riders is greater than 110 percent of the average increase for all riders:

$$\begin{aligned} \text{Low-income Average Fare Decrease} &< 90\% \times \text{All-Rider Average Fare Decrease} \\ \text{Low-income Average Fare Increase} &> 110\% \times \text{All-Rider Average Fare Increase} \end{aligned}$$

The DI/DB Policy also describes the steps the MBTA will take when disparate impacts or disproportionate burdens are identified:

“Upon finding a potential disparate impact on minority populations from a proposed fare change, the MBTA will analyze alternatives/revisions to the proposed change that meet the same goals of the original proposal. Any proposed alternative fare change would be subject to a fare equity analysis. The MBTA will implement any proposal in accordance with the current FTA guidance. Where potential disparate impacts are identified, the MBTA will provide a meaningful opportunity for public comment on any

² Massachusetts Bay Transportation Authority, “Disparate Impact/Disproportionate Burden (DI/DB) Policy” (2017). <https://cdn.mbta.com/sites/default/files/2017-11/1-30-17%20-%20MBTA%20DIDB%20Policy%20-%20Final.docx>.

proposed mitigation measures, including any less discriminatory alternatives that may be available. Upon finding a potential disproportionate burden on low-income populations from a proposed fare change, the MBTA may take steps to avoid, minimize, or mitigate these impacts, where practicable.”

MBTA Disparate Impact/Disproportionate Burden (DI/DB) Policy

3.2 Minority and Low-Income Populations

Respondents to the 2015–17 MBTA Systemwide Passenger Survey were classified as having minority status if they self-identified as a race other than White or as Hispanic or Latino/Latina. Respondents whose household income was less than \$43,500—the income category from the survey that most closely matched 60 percent of the median household income for the MBTA service area from the 2013 American Community Survey—were classified as low-income.

4 DATASETS, DATA COLLECTION EFFORTS, AND DESCRIPTIONS

CTPS used three primary datasets in the fare equity analysis:

- 2015–17 MBTA Systemwide Passenger Survey
- MBTA ridership and revenue data
- mTicket FlexPass usage survey, September–October 2021

4.1 2015-17 MBTA Systemwide Passenger Survey

The 2015–17 MBTA Systemwide Passenger Survey report,³ published in May 2018, includes all of the transit modes provided by the MBTA—the heavy rail Red, Blue, and Orange Lines; the light rail Green Line and Mattapan Trolley; the bus rapid transit Silver Line; the commuter rail system; the bus system; and the ferry system. The survey asked questions regarding trip origins and destinations, fare payment method, trip frequency, race, ethnicity, and income.

CTPS first launched the survey online and advertised its availability throughout the MBTA system. When the response rate to the online survey slowed, staff distributed the survey on paper forms at stations and stops and on vehicles. To compensate for differences in response rates among services, responses from each unlinked trip segment were weighted in proportion to the number of typical daily boardings for a corresponding station, group of stations, route, or route segment.

4.2 MBTA Ridership and Revenue Data

The MBTA provided CTPS with ridership data from its automated fare collection (AFC) system from SFY 2018. These data included unlinked trips by mode, fare-

³ Central Transportation Planning Staff, “2015–17 MBTA Systemwide Passenger Survey” (2018).

https://www.ctps.org/dv/mbtasurvey2018/2015_2017_Passenger_Survey_Final_Report.pdf.

payment type, and fare media. For modes that are not part of the AFC system, the MBTA provided other data, such as monthly pass sales data. CTPS also used output data from the SFY 2022 fare change analysis to estimate the base revenue, ridership, and average fares.⁴ These ridership and revenue data were used in conjunction with systemwide passenger survey data to estimate (1) the number of trips made by riders using each fare type and mode, and (2) the magnitude of the fare changes for low-income passengers, minority passengers, and all passengers.

Additionally, the MBTA provided transaction-level data from the AFC system from October 2019 so that CTPS could analyze the impact of changing transfer rules on bus and rapid transit travel.

4.3 mTicket FlexPass Usage Survey

In September–October 2021, the MBTA distributed a FlexPass Usage Survey to a sample of 7,645 mTicket passengers by email and received 1,365 completed responses; 758 of those respondents had purchased a FlexPass. The intent of this survey was to attach demographic classifications to data for actual trips made on commuter rail using different fare products and study the effect that the FlexPass had on commuter rail travel.

5 OVERVIEW OF ANALYSIS METHODS

5.1 Agent-Based Ridership Model

In recent years, CTPS has used an elasticity-based spreadsheet model known as the Fare Elasticity, Ridership, and Revenue Estimation Tool (FERRET) to analyze the impacts of fare changes on demographic population groups. However, the present proposed fare changes extend outside of the scope of what can be efficiently analyzed in FERRET, given the quantity of new fare products that are proposed. As a result, CTPS developed an agent-based fare equity analysis methodology derived primarily from responses to the 2015–17 MBTA Systemwide Passenger Survey. CTPS built the agent-based ridership model from the foundations of FERRET, but we adapted the process to prioritize equity reporting and to be more flexible so that it can more efficiently analyze new fare products.

To make the agent-based ridership model CTPS matched survey responses with annual MBTA ridership and revenue. Within the model, we distribute unlinked trips from the base ridership year across systemwide survey responses through the survey weighting process. Then, we estimate the number of passengers—or agents—each survey represents based on the trip-making patterns reported in the survey response, and we identify fare products used, modes traveled on, and the reported trip frequency.

⁴ This analysis is described in the CTPS memorandum “SFY 2022: Fare Equity Analysis Results,” dated April 26, 2021.

Individual agents in the model approximate passenger behavior, as individual agents are assumed to make the same trip with the same fare product at a constant trip frequency the entire year. However, the total trips made in the model by all agents equals the total amount of unlinked trips observed in the base ridership year. Additionally, the amount of money agents spend on their travel equals the amount of fare revenue anticipated for the most recent fare structure.

5.1.1 Survey Weighting by Fare Product and Mode

To develop the agent-based model from the systemwide ridership survey, CTPS determined that survey responses should be reweighted by annual unlinked boardings by fare product and mode.⁵ CTPS staff reweighted the travel reported in survey responses to observed boardings by fare product and mode for SFY 2018. Survey responses were excluded from the analysis if

- minority or income status were unreported,
- all fare payment information was missing,
- a fare product could not be assigned because fare questions were incomplete, or
- trip frequency was unreported.

Multiple proposed fare changes apply to commuter rail travel, so CTPS further balanced weighted trips on commuter rail to match peak and off-peak travel patterns. After commuter rail trips were weighted to annual boardings, survey trips were then balanced to match the proportion of boardings occurring during peak and off-peak periods by commuter rail line.⁶

The survey weighting process allocates observed boardings from the base ridership year across survey responses.⁷ Table 2 displays the demographic split between equity populations across modes after weighting the systemwide survey to fare product use by mode to SFY 2018 ridership.⁸ Additionally, Table 3 provides a snapshot of fare type usage by demographic group after the survey travel was weighted to fare-product usage by mode.

⁵ The systemwide passenger survey was originally weighted based solely on ridership. For more details see the report: https://www.ctps.org/dv/mbtasurvey2018/2015_2017_Passenger_Survey_Final_Report.pdf

⁶ Commuter rail peak and off-peak boarding ratios were derived from spring 2018 commuter rail counts using peak and off-peak period data from the MBTA Service Delivery Policy. See the commuter rail counts database: <https://mbta-massdot.opendata.arcgis.com/datasets/mbta-commuter-rail-ridership-by-trip-season-route-line-and-stop/explore> and <https://mbta-massdot.opendata.arcgis.com/datasets/mbta-service-delivery-policy-time-periods/explore>.

⁷ In this analysis, the term *boarding* represents an unlinked trip: any time a passenger boards a transit vehicle is considered a boarding.

⁸ Differences from Table 2 in previous service equity analyses are due to the reweighting of the survey. <https://cdn.mbta.com/sites/default/files/2021-04/2021-proposed-fare-change-title-vi-equity-analysis.pdf>

Table 2
Demographic Profiles of MBTA Riders by Mode

Mode	Minority	Nonminority	Low-Income	Non-Low-Income
Bus	46.7%	53.3%	43.0%	57.0%
Commuter Rail	14.4%	85.6%	6.8%	93.2%
Commuter/Ferry Boat	0.8%	99.2%	0.7%	99.3%
Silver Line	36.9%	63.1%	27.0%	73.0%
Subway or Light Rail	35.0%	65.0%	29.2%	70.8%

Source: 2015–17 MBTA Systemwide Passenger Survey, reweighted for Agent-Based Ridership Model by CTPS.

Table 3
Principal Fare Payment Type Used by Minority, Low-income, and All Riders

Fare-Payment Type	Existing Fare	Annual Usage in Unlinked Trips			Annual Usage Share of Group Total		
		Minority	Low-Income	All Riders	Minority	Low-Income	All Riders
Local Bus							
Local Bus Pass	\$55.00	2,012,000	1,588,000	5,083,000	1.6%	1.5%	1.4%
Local Bus (Adult)	\$1.70	9,747,000	9,434,000	24,790,000	7.6%	8.7%	7.0%
Local Bus (Senior)	\$0.85	1,588,000	3,276,000	4,815,000	1.2%	3.0%	1.4%
Local Bus (Student)	\$0.85	1,384,000	1,059,000	1,948,000	1.1%	1.0%	0.6%
Express Bus							
Express Bus Pass	\$136.00	922,000	355,000	2,852,000	0.7%	0.3%	0.8%
Express Bus (Adult)	\$4.25	248,000	255,000	934,000	0.2%	0.2%	0.3%
Express Bus (Senior)	\$2.10	14,000	NR	103,000	0.0%	0.0%	0.0%
Express Bus (Student)	\$2.10	NR	21,000	42,000	0.0%	0.0%	0.0%
Bus and Rapid Transit							
Bus and Rapid Transit (Adult)	\$2.40	2,577,000	2,281,000	6,978,000	2.0%	2.1%	2.0%
Bus and Rapid Transit (Senior)	\$1.10	421,000	783,000	1,372,000	0.3%	0.7%	0.4%
Bus and Rapid Transit (Student)	\$1.10	379,000	333,000	507,000	0.3%	0.3%	0.2%
Rapid Transit							
Monthly LinkPass	\$90.00	30,489,000	20,534,000	98,998,000	23.9%	19.0%	28.0%
Senior/TAP LinkPass	\$30.00	5,619,000	7,827,000	14,605,000	4.4%	7.2%	4.1%
Student 7-Day/ Youth Pass	\$30.00	13,767,000	10,021,000	15,039,000	10.8%	9.3%	4.3%
1-Day LinkPass	\$12.75	800,000	816,000	1,010,000	0.6%	0.8%	0.3%
7-Day LinkPass	\$22.50	28,616,000	27,101,000	44,104,000	22.4%	25.0%	12.5%
Rapid Transit (Adult)	\$2.40	13,187,000	9,834,000	54,610,000	10.3%	9.1%	15.5%
Rapid Transit (Senior)	\$1.10	588,000	1,175,000	4,196,000	0.5%	1.1%	1.2%

Fare-Payment Type	Existing Fare	Annual Usage in Unlinked Trips			Annual Usage Share of Group Total		
		Minority	Low-Income	All Riders	Minority	Low-Income	All Riders
Rapid Transit (Student)	\$1.10	949,000	1,178,000	1,958,000	0.7%	1.1%	0.6%
Commuter Rail							
Zone 1A-10 Pass	\$80.00-\$426.00	5,575,000	2,164,000	30,143,000	4.4%	2.0%	8.5%
Interzone 1-10 Pass	\$80.00-\$257.00	32,000	14,000	114,000	0.0%	0.0%	0.0%
Zone 1A-10 Single Ride	\$2.40-\$13.25	1,612,000	980,000	15,591,000	1.3%	0.9%	4.4%
Interzone 1-10 Single Ride	\$2.75-\$6.75	57,000	201,000	606,000	0.0%	0.2%	0.2%
Ferry							
Commuter Ferry Pass	\$329.00	20,000	24,000	329,000	0.0%	0.0%	0.1%
Hingham/Hull Ferry	\$9.75	NR	NR	678,000	0.0%	0.0%	0.2%
Charlestown Ferry	\$3.70	NR	NR	NR	0.0%	0.0%	0.0%
Free Transfers and Other Fares							
In-station Transfers	No Cost	6,028,000	5,425,000	17,539,000	4.7%	5.0%	5.0%
Free trips	No Cost	922,000	1,573,000	4,180,000	0.7%	1.4%	1.2%

Notes: Values are rounded to the nearest 1,000. Percentages are calculated using unrounded values. NR indicates that insufficient riders from a given classification responded to the survey. The figures for free trips include people who are not required to pay a fare. Some of these people pay with the Blind Access Card.

NR = No response or insufficient responses. TAP = Transportation Access Pass.

Source: Central Transportation Planning Staff.

5.1.2 Rationale for Weighting to Ridership from a Pre-Pandemic Year

While 2020 ridership numbers were available, CTPS chose to use 2018 ridership numbers for the following reasons:

- 1) Ridership numbers from 2018 better match the demographics from the systemwide ridership survey.
- 2) The pandemic potentially altered the demographic profile of the MBTA's ridership. Updating ridership to intra-pandemic quantities without updating demographic inputs would result in an analysis insensitive to potentially inconsistent demographic shifts both in travel patterns and fare purchasing decisions.
- 3) For the proposed fare changes that result in less expensive travel options on commuter rail, using pre-pandemic ridership is the more conservative approach for an equity analysis.

The COVID-19 pandemic precipitated a large decrease in ridership throughout the MBTA, but proportionally the decrease was greatest on commuter rail. Historically, the majority of passengers on commuter rail have been non-low-income and nonminority passengers. Therefore, scaling pre-pandemic demographics to more recent ridership patterns would make an equity analysis artificially easier to pass, as the quantity of trips being made by non-protected populations would decrease at a greater rate than trips made on modes more heavily used by protected populations. The result would be a DI or DB ratio that is less sensitive to an impact on protected populations. Without a more recent systemwide survey to collect demographic data for fare product usage, it is more conservative to conduct equity analyses with pre-pandemic ridership data that matches the available fare product usage data.⁹

5.1.3 Pricing Survey Travel and Estimating Revenue from Fares

CTPS calculated the annual cost of reported travel in the passenger survey dataset based on the pricing structure that was in place as of July 1, 2021.¹⁰ Fare products in the survey that no longer carry a price difference were consolidated (such as inner and outer express buses). To find annual costs for travel, CTPS assumed that each survey respondent would travel at the reported frequency for the entire SFY; so, we scaled up each person's trip frequency accordingly. For example, if a respondent reported purchasing a monthly LinkPass for \$90, then that person was assumed to have purchased the same pass every month, for a total of \$1,080 spent on fares that year. Alternatively, if a respondent paid for travel on a per-ride basis, the travel costs were calculated as the total cost of the linked trip at the estimated scaled trip frequency. For example, if travel included a rapid transit trip with a step-up transfer to bus service three-to-four days a week, each linked trip would cost \$2.40 and the person would make this trip

⁹ The MBTA has begun the process of collecting updated ridership survey data that will be available to use in future analyses.

¹⁰ Prices were found at <https://cdn.mbta.com/sites/default/files/2021-06/2021-07-01-mbta-combined-tariff.pdf>.

approximately 29.7 times a month or 357 times a year.¹¹ In total, this per-ride travel would cost \$856.73 per year.

CTPS estimated the number of passengers represented by each survey response by dividing the total weighted boardings per survey response by the boardings per passenger associated with the reported survey travel.

$$\text{Passengers represented per survey} = \frac{\text{Weighted boardings}}{\text{Boardings per passenger in survey response}}$$

CTPS estimated the revenue per survey response as the number of passengers represented per survey multiplied by the cost of yearly travel per passenger.

$$\begin{aligned} \text{Revenue per survey} \\ &= (\text{Cost of yearly travel per passenger}) \\ &\times (\text{Passengers represented per survey}) \end{aligned}$$

This process was used to calculate the revenue and total trips associated with minority, low-income, and all riders for the current fare structure. Next, CTPS found how travel costs would change under the proposed fare structure. To identify the change in price for fare changes made to existing fare products, CTPS priced survey travel using the proposed pricing structure. For example, the cost of a 1-Day LinkPass was set to \$11.00 as opposed to \$12.75. However, for new fare products, CTPS identified the riders with travel patterns that will be best served by the new fare product and shifted them to the new product.

5.1.4 Introducing New Fare Products to Agent-Based Model

Within the agent-based model, whether or not passengers shift to a new fare product and what fare product they switch to depend on 1) the cost of their travel under the proposed fare structure, 2) what alternative fare products cover their travel, and 3) how efficiently their reported fare product covered the trip-making patterns in the survey response.

To determine if a survey respondent would switch to a new fare product within the agent-based model, CTPS uses the following methodology:

- 1) Find the price for the reported travel using all possible fare products, including the per-ride price and all passes that cover the modes indicated in the survey response.

¹¹ When the survey frequency was collected as a range, CTPS took the weekly midpoint (i.e., “three-to-four days a week” is equivalent to 3.5 days per week). To calculate monthly and yearly frequencies, CTPS scaled by 4.33 weeks in a month and 12 months in a year. Additionally, the return trip rate is set to 1.96, which was found by calibrating the agent-based model to the annual fares revenue from the most recent Fare Equity Analysis: “SFY 2022: Fare Equity Analysis Results,” dated April 26, 2021.

- 2) Identify the most cost-efficient fare option for reported travel based on the trip-making information provided in the survey.
- 3) Determine how likely the survey respondent is to switch to a new fare product by assigning a sensitivity threshold to each survey response. (See the next section for further discussion.)
- 4) Find the percent change in cost between the reported fare product and all possible fare products in the proposed fare structure.
- 5) Switch passengers to a new fare product if the cost savings exceed their sensitivity threshold.

5.1.5 Estimating Survey Respondents' Sensitivity to Change

The ridership survey represents an incomplete snapshot of a passenger's travel, as it asked respondents to report their fare payment and travel for their most recent MBTA trip. For example, a passenger could have an Express Bus Pass, but the passenger's most recent MBTA trip reported in the survey was a rapid transit trip. As a result, not every survey response is matched to the most efficient fare product for the reported travel patterns. Indeed, 32 percent of survey respondents are "overpaying" by an average of \$42.03 per month.

To address this issue, we estimate a sensitivity threshold to describe how sensitive a given respondent is to a price change, based on how appropriate the reported fare product is for the passenger's travel. Then, when introducing new fare products, CTPS projects a fare product switch if the cost savings exceed the sensitivity threshold. If we find a respondent is purchasing the lowest cost fare product in the baseline, then we assume that person is more sensitive to a price change than someone who could potentially be saving tens to hundreds of dollars per month.

To determine whether a survey respondent will switch to a lower cost fare product, we classified respondents into three sensitivity categories: *very sensitive*, *somewhat sensitive*, and *insensitive*:

- **Very sensitive** respondents are purchasing the lowest cost fare product available in the baseline. *Very sensitive* respondents comprise about 68 percent of survey respondents. Respondents in this category will switch to a new fare product if switching would result in a five percent cost savings or more.
- **Somewhat sensitive** respondents are not purchasing the lowest cost fare product available, but their potential savings are less than their sensitivity threshold. *Somewhat sensitive* respondents make up 19 percent of survey responses.
- **Insensitive** respondents are not purchasing the lowest cost fare product available, and their potential savings are greater than the weighted average of potential savings for similar riders. *Insensitive* respondents make up 13 percent of survey responses. In the model, these riders will not switch to a new fare product regardless of the potential cost savings,

as we assume their choice of fare product is minimally related to the fare product cost.

CTPS found the sensitivity threshold to distinguish between *somewhat sensitive* and *insensitive* survey respondents by finding the average percent respondents “overpaid” for similar travel. Among survey respondents who were not already purchasing the most cost-efficient fare product, commuter rail and/or ferry riders purchasing single-ride fares paid an average of 26 percent more than their most efficient fare product; commuter rail and/or ferry riders traveling on a pass paid 24 percent more. Bus and/or rapid transit riders purchasing single-ride fares paid an average of 17 percent more than their most efficient fare product, and bus and/or rapid transit riders traveling on a pass paid 54 percent more. For example, if rapid transit and bus riders were paying \$101.88 per month in the baseline with standard one-way fares, they could save approximately 12 percent if they switched to a \$90 Monthly LinkPass. The average savings for rapid transit and bus riders paying with one-way fares is about 17 percent. Since the potential savings is below the average, these respondents are classified as *somewhat sensitive*. As a result, they will only switch to a new fare product if it offers more than a 17 percent savings or if the monthly pass price is below \$84.56.

5.2 Estimating Equity of Changing Transfer Rules

CTPS analyzed the equity impacts for the proposed transfer rule changes independent of the agent-based ridership model analysis due to sample size limitations of the MBTA passenger survey and the opportunity afforded by transaction-level AFC data. The AFC system records the location and mode of every instance where a CharlieCard or CharlieTicket interacts with the AFC system, which currently includes local bus, rapid transit, and express bus fares. The current transfer policy allows riders using stored value within the AFC system to transfer to *one* additional transit service (with a few exceptions) and pay only for the trip with the greatest fare. The proposed transfer rule change would expand this policy to allow passengers using stored value *a free second transfer* on bus and subway and *one free transfer* between express buses.

CTPS estimated the equity of the proposed transfer rule by calculating the change in revenue when the proposed transfer rules are applied to a sample of AFC transactions. Then, CTPS estimated demographic classifications for passengers making those trips based on the transaction locations. CTPS first identified how much passengers using stored value CharlieCards or CharlieTickets spent per trip under the current transfer rules. CTPS compared this baseline revenue to how much these passengers would spend under the proposed transfer rules. Next, we assigned each AFC transaction a location based on the most frequent rapid transit station or bus route used by each holder of a distinct fare CharlieCard or CharlieTicket. Demographic estimates were then joined to ridership and revenue estimates using the MBTA passenger survey summary demographics for routes and stations. Finally, these demographic ratios were multiplied by the total trips and revenue values to estimate the

potential equity impacts. This analysis was conducted for one month of pre-pandemic AFC transaction data, and the results were scaled to an annual estimate.¹²

6 RESULTS

6.1 Estimated Revenue Impacts for Proposed Fare Changes

CTPS designed the agent-based model to report on the equity of proposed fare change packages without overestimating the impact of competing fare changes. For example, in the proposed changes, we tested the equity of introducing multiple new fare products for commuter rail reduced-fare riders including FlexPasses and Monthly Passes. As a result, based on the trip-making patterns recorded in the survey response, some riders will shift to FlexPasses to cover their travel and another subset will shift to monthly passes. In the planning process, it is also helpful to assess the impact of fare changes on an individual basis. Table 4 summarizes revenue impact by individual fare change and as a package for each population. Note, the final column in Table 4 presents the revenue change for the package of changes. The preceding revenue change columns do not sum exactly to the packaged primary model run, as some passengers have competing options for travel when the fare changes are packaged together.

CTPS combined the revenue changes from the primary model with the revenue impact estimates from the proposed transfer rule changes found from the AFC transaction level data. Table 5 shows the change in revenue and projected change in average fares associated with the proposed revenue changes for the primary model and off-model analysis combined.

¹² AFC transaction data from October 2019 was scaled to an annual amount by finding the ratio of annual rapid transit boardings from 2019 to rapid transit boardings from October 2019. The resulting scaling factor is 11.11906.

Table 4
Summary of Revenue Changes by Population for Proposed Fare Changes Analyzed in the Agent-Based Model

Rider Classification	Existing Number of Trips	Existing Revenue	Change of Revenue: Lower 1-Day LinkPass to \$11*	Change of Revenue: Reduced 7-Day LinkPass at \$10*	Change of Revenue: mTicket FlexPass as Permanent Fare Product*	Change of Revenue: Reduced Monthly Passes on All Modes*	Change of Revenue: Primary Model
Minority	127,600,000	\$165,300,000	-\$350,919	-\$455,530	-\$241,466	-\$54,656	-\$1,137,798
Low-Income	108,300,000	\$125,200,000	-\$353,400	-\$643,404	-\$31,806	-\$40,991	-\$1,095,450
All Riders	353,100,000	\$675,200,000	-\$448,969	-\$1,016,432	-\$2,237,355	-\$1,933,105	-\$5,742,527

Note: Revenue and ridership figures are based on a pre-COVID-19 year. They are not scaled to reflect ridership recovery scenarios. Reduced monthly passes on all modes includes updating validity rules to make reduced LinkPasses valid on Charlestown ferry and commuter rail Zone 1A.

* Results for proposed fare change run in isolation on the agent-based model.

Source: Central Transportation Planning Staff.

Table 5
Summary of Revenue Changes by Population for All Proposed Fare Changes

Rider Classification	Existing Number of Trips	Existing Revenue	Existing Average Fare	Change of Revenue: Primary Model	Change of Revenue: Bus Transfers	Total Revenue Change	Projected Revenue	Projected Average Fare	Percent Change: Average Fare
Minority	127,600,000	\$165,300,000	\$1.2956	-\$1,137,798	-\$316,382	-\$1,454,180	\$163,854,820	\$1.2845	-0.86%
Low-Income	108,300,000	\$125,200,000	\$1.1564	-\$1,095,450	-\$261,787	-\$1,357,238	\$123,842,762	\$1.1440	-1.07%
All Riders	353,100,000	\$675,200,000	\$1.9120	-\$5,742,527	-\$606,220	-\$6,348,746	\$668,851,254	\$1.8941	-0.94%

Note: Revenue and ridership figures are based on a pre-COVID-19 year. They are not scaled to reflect ridership recovery scenarios.

Source: MBTA Automatic Fare Transactions, processed by Central Transportation Planning Staff.

6.1.1 FlexPass Demographics

The MBTA introduced the FlexPass as an mTicket fare product in July 2020 as a promotional fare product. Notably, this product was introduced after COVID-19 had dramatically affected MBTA transit ridership. However, for the equity analysis of the current proposed fare changes, CTPS reported on equity using a pre-pandemic base ridership year. In the fall of 2021, the MBTA conducted an mTicket survey to capture the demographics of passengers who purchased FlexPasses. The mTicket FlexPass Usage Survey asked active mTicket riders about either their experience using the FlexPass or why it did not serve their travel. Additionally, the survey asked respondents for demographic information including their racial identification and annual household income.

CTPS analyzed the results of this survey; however, when reporting on the equity of making the FlexPass a permanent fare product, we used the results from the agent-based equity model described above that examined introducing the FlexPass. We made this choice to avoid conflating pre-pandemic and intra-pandemic ridership demographics on commuter rail and to prevent double-counting of FlexPass usage. Results from the fall 2021 survey effort are presented here as a point of reference.

When processing survey results, CTPS classified surveyed passengers who reported an annual household income below \$53,500 as low-income.¹³ Passengers who self-identified as a race other than White or as Hispanic or Latino/Latina were classified as minority passengers. Survey responses were weighted to total mTicket activations. Table 6 shows the demographics of FlexPass passengers from the mTicket survey conducted in fall 2021.

¹³ Income of \$53,500 is 60 percent of the area median income based on 2015–19 American Community Survey household income distribution data from the US Census. For more on this threshold see the CTPS Memorandum “Fare Transformation Proposed Sales Network Analysis” dated March 4, 2021.

**Table 6
Demographics of FlexPass Passengers**

Rider Classification	Number of Respondents	Proportion	Margin of Error
Minority	110	15.1%	±4.7%
Low-income	43	7.9%	±3.8%

Note: There were 682 respondents who provided enough information to determine their minority status, and 599 respondents provided enough information to determine their income status. The margin of error is based on a 95 percent confidence level.

Source: MBTA FlexPass Usage Survey (October 2021).

6.2 Summary of All Changes

The results of the equity analysis, shown in Table 7, show that the proposed fare changes would neither produce a disparate impact on minority riders nor a disproportionate burden to low-income riders.

**Table 7
Existing and Projected Average Fares and Price Changes**

Rider Classification	Existing Average Fare	Projected Average Fare	Percent Price Change	DI/DB Ratio
Minority	\$1.2956	\$1.2845	-0.86%	91.72%
Low-Income	\$1.1564	\$1.1440	-1.07%	113.92%
All Riders	\$1.9120	\$1.8941	0.94%	—

Note: Percent changes in average fares and DI/DB ratios are calculated prior to rounding.

DI/DB = disparate impact and disproportionate burden.

Source: Central Transportation Planning Staff.

Application of the disparate-impact threshold to the combined pre-pandemic results shows that the relative decrease in the average fare for minority riders is 92 percent of the relative decrease in the average fare for all riders. Application of the disproportionate-burden threshold shows that the relative decrease in the average fare for low-income riders is 115 percent of the relative decrease in the average fare for all riders.

Because the average fare decreases for both minority and low-income riders are both greater than 90 percent of the average fare decrease for all riders—the threshold defined by the DI/DB policy—CTPS does not find a disparate impact on minority riders or a disproportionate burden on low-income riders.

Appendix: Table 8

The Boston Region Metropolitan Planning Organization (MPO) operates its programs, services, and activities in compliance with federal nondiscrimination laws including Title VI of the Civil Rights Act of 1964 (Title VI), the Civil Rights Restoration Act of 1987, and related statutes and regulations. Title VI prohibits discrimination in federally assisted programs and requires that no person in the United States of America shall, on the grounds of race, color, or national origin (including limited English proficiency), be excluded from participation in, denied the benefits of, or be otherwise subjected to discrimination under any program or activity that receives federal assistance. Related federal nondiscrimination laws administered by the Federal Highway Administration, Federal Transit Administration, or both, prohibit discrimination on the basis of age, sex, and disability. The Boston Region MPO considers these protected populations in its Title VI Programs, consistent with federal interpretation and administration. In addition, the Boston Region MPO provides meaningful access to its programs, services, and activities to individuals with limited English proficiency, in compliance with U.S. Department of Transportation policy and guidance on federal Executive Order 13166.

The Boston Region MPO also complies with the Massachusetts Public Accommodation Law, M.G.L. c 272 sections 92a, 98, 98a, which prohibits making any distinction, discrimination, or restriction in admission to, or treatment in a place of public accommodation based on race, color, religious creed, national origin, sex, sexual orientation, disability, or ancestry. Likewise, the Boston Region MPO complies with the Governor's Executive Order 526, section 4, which requires that all programs, activities, and services provided, performed, licensed, chartered, funded, regulated, or contracted for by the state shall be conducted without unlawful discrimination based on race, color, age, gender, ethnicity, sexual orientation, gender identity or expression, religion, creed, ancestry, national origin, disability, veteran's status (including Vietnam-era veterans), or background.

A complaint form and additional information can be obtained by contacting the MPO or at http://www.bostonmpo.org/mpo_non_discrimination.

To request this information in a different language or in an accessible format, please contact

Title VI Specialist
Boston Region MPO
10 Park Plaza, Suite 2150
Boston, MA 02116
civilrights@ctps.org

By Telephone:

857.702.3702 (voice)

For people with hearing or speaking difficulties, connect through the state MassRelay service:

- **Relay Using TTY or Hearing Carry-over:** 800.439.2370
- **Relay Using Voice Carry-over:** 866.887.6619
- **Relay Using Text to Speech:** 866.645.9870

For more information, including numbers for Spanish speakers, visit <https://www.mass.gov/massrelay>.

APPENDIX: TABLE 8

Table 8
Complete Pass Prices: Existing and Proposed

Fare Product	Rider Type	Existing Fare	Proposed Fare	Percent Change
<i>Bus and Rapid Transit</i>				
1-Day LinkPass	Adult	\$12.75	\$11.00	-14%
7-Day LinkPass	Adult	\$22.50	\$22.50	0%
Monthly Local Bus	Adult	\$55.00	\$55.00	0%
Monthly LinkPass	Adult	\$90.00	\$90.00	0%
Monthly Express Bus	Adult	\$136.00	\$136.00	0%
Monthly LinkPass	Reduced	\$30.00	\$30.00	0%
7-Day LinkPass	Reduced	Not offered	\$10.00	New product
Express Bus	Reduced	Not offered	\$67.00	New product
<i>Commuter Rail</i>				
Zone 1A	Adult	\$90.00	\$90.00	0%
Zone 1	Adult	\$214.00	\$214.00	0%
Zone 2	Adult	\$232.00	\$232.00	0%
Zone 3	Adult	\$261.00	\$261.00	0%
Zone 4	Adult	\$281.00	\$281.00	0%
Zone 5	Adult	\$311.00	\$311.00	0%
Zone 6	Adult	\$340.00	\$340.00	0%
Zone 7	Adult	\$360.00	\$360.00	0%
Zone 8	Adult	\$388.00	\$388.00	0%
Zone 9	Adult	\$406.00	\$406.00	0%
Zone 10	Adult	\$426.00	\$426.00	0%
Interzone 1	Adult	\$90.00	\$90.00	0%
Interzone 2	Adult	\$110.00	\$110.00	0%
Interzone 3	Adult	\$120.00	\$120.00	0%
Interzone 4	Adult	\$139.00	\$139.00	0%
Interzone 5	Adult	\$158.00	\$158.00	0%
Interzone 6	Adult	\$178.00	\$178.00	0%
Interzone 7	Adult	\$196.00	\$196.00	0%
Interzone 8	Adult	\$216.00	\$216.00	0%
Interzone 9	Adult	\$237.00	\$237.00	0%
Interzone 10	Adult	\$257.00	\$257.00	0%
Zone 1A (mTicket)	Adult	\$80.00	\$80.00	0%
Zone 1 (mTicket)	Adult	\$204.00	\$204.00	0%
Zone 2 (mTicket)	Adult	\$222.00	\$222.00	0%
Zone 3 (mTicket)	Adult	\$251.00	\$251.00	0%
Zone 4 (mTicket)	Adult	\$271.00	\$271.00	0%

Fare Product	Rider Type	Existing Fare	Proposed Fare	Percent Change
Zone 5 (mTicket)	Adult	\$301.00	\$301.00	0%
Zone 6 (mTicket)	Adult	\$330.00	\$330.00	0%
Zone 7 (mTicket)	Adult	\$350.00	\$350.00	0%
Zone 8 (mTicket)	Adult	\$378.00	\$378.00	0%
Zone 9 (mTicket)	Adult	\$396.00	\$396.00	0%
Zone 10 (mTicket)	Adult	\$416.00	\$416.00	0%
Interzone 1 (mTicket)	Adult	\$80.00	\$80.00	0%
Interzone 2 (mTicket)	Adult	\$100.00	\$100.00	0%
Interzone 3 (mTicket)	Adult	\$110.00	\$110.00	0%
Interzone 4 (mTicket)	Adult	\$129.00	\$129.00	0%
Interzone 5 (mTicket)	Adult	\$148.00	\$148.00	0%
Interzone 6 (mTicket)	Adult	\$168.00	\$168.00	0%
Interzone 7 (mTicket)	Adult	\$186.00	\$186.00	0%
Interzone 8 (mTicket)	Adult	\$206.00	\$206.00	0%
Interzone 9 (mTicket)	Adult	\$227.00	\$227.00	0%
Interzone 10 (mTicket)	Adult	\$247.00	\$247.00	0%
Weekend Pass	Adult	\$10.00	\$10.00	0%
Zone 1A	Reduced	Not offered	\$30.00	New product
Zone 1	Reduced	Not offered	\$107.00	New product
Zone 2	Reduced	Not offered	\$116.00	New product
Zone 3	Reduced	Not offered	\$130.00	New product
Zone 4	Reduced	Not offered	\$136.00	New product
Zone 5	Reduced	Not offered	\$152.00	New product
Zone 6	Reduced	Not offered	\$170.00	New product
Zone 7	Reduced	Not offered	\$180.00	New product
Zone 8	Reduced	Not offered	\$190.00	New product
Zone 9	Reduced	Not offered	\$199.00	New product
Zone 10	Reduced	Not offered	\$209.00	New product
Interzone 1	Reduced	Not offered	\$41.00	New product
Interzone 2	Reduced	Not offered	\$51.00	New product
Interzone 3	Reduced	Not offered	\$60.00	New product
Interzone 4	Reduced	Not offered	\$65.00	New product
Interzone 5	Reduced	Not offered	\$75.00	New product
Interzone 6	Reduced	Not offered	\$85.00	New product
Interzone 7	Reduced	Not offered	\$94.00	New product
Interzone 8	Reduced	Not offered	\$104.00	New product
Interzone 9	Reduced	Not offered	\$114.00	New product
Interzone 10	Reduced	Not offered	\$124.00	New product
Zone 1A (mTicket)	Reduced	Not offered	\$30.00	New product
Zone 1 (mTicket)	Reduced	Not offered	\$102.00	New product
Zone 2 (mTicket)	Reduced	Not offered	\$111.00	New product

Fare Product	Rider Type	Existing Fare	Proposed Fare	Percent Change
Zone 3 (mTicket)	Reduced	Not offered	\$125.00	New product
Zone 4 (mTicket)	Reduced	Not offered	\$131.00	New product
Zone 5 (mTicket)	Reduced	Not offered	\$147.00	New product
Zone 6 (mTicket)	Reduced	Not offered	\$165.00	New product
Zone 7 (mTicket)	Reduced	Not offered	\$175.00	New product
Zone 8 (mTicket)	Reduced	Not offered	\$185.00	New product
Zone 9 (mTicket)	Reduced	Not offered	\$194.00	New product
Zone 10 (mTicket)	Reduced	Not offered	\$204.00	New product
Interzone 1 (mTicket)	Reduced	Not offered	\$36.00	New product
Interzone 2 (mTicket)	Reduced	Not offered	\$46.00	New product
Interzone 3 (mTicket)	Reduced	Not offered	\$55.00	New product
Interzone 4 (mTicket)	Reduced	Not offered	\$60.00	New product
Interzone 5 (mTicket)	Reduced	Not offered	\$70.00	New product
Interzone 6 (mTicket)	Reduced	Not offered	\$80.00	New product
Interzone 7 (mTicket)	Reduced	Not offered	\$89.00	New product
Interzone 8 (mTicket)	Reduced	Not offered	\$99.00	New product
Interzone 9 (mTicket)	Reduced	Not offered	\$109.00	New product
Interzone 10 (mTicket)	Reduced	Not offered	\$119.00	New product
FlexPass Zone 1A	Adult	Promotional Product	\$21.60	New product
FlexPass Zone 1	Adult	Promotional Product	\$58.50	New product
FlexPass Zone 2	Adult	Promotional Product	\$63.00	New product
FlexPass Zone 3	Adult	Promotional Product	\$72.00	New product
FlexPass Zone 4	Adult	Promotional Product	\$78.75	New product
FlexPass Zone 5	Adult	Promotional Product	\$87.75	New product
FlexPass Zone 6	Adult	Promotional Product	\$94.50	New product
FlexPass Zone 7	Adult	Promotional Product	\$99.00	New product
FlexPass Zone 8	Adult	Promotional Product	\$110.25	New product
FlexPass Zone 9	Adult	Promotional Product	\$114.75	New product
FlexPass Zone 10	Adult	Promotional Product	\$119.25	New product
FlexPass Interzone 1	Adult	Promotional Product	\$24.75	New product
FlexPass Interzone 2	Adult	Promotional Product	\$29.25	New product
FlexPass Interzone 3	Adult	Promotional Product	\$31.50	New product
FlexPass Interzone 4	Adult	Promotional Product	\$38.25	New product
FlexPass Interzone 5	Adult	Promotional Product	\$42.75	New product
FlexPass Interzone 6	Adult	Promotional Product	\$47.25	New product
FlexPass Interzone 7	Adult	Promotional Product	\$51.75	New product
FlexPass Interzone 8	Adult	Promotional Product	\$56.25	New product
FlexPass Interzone 9	Adult	Promotional Product	\$60.75	New product
FlexPass Interzone 10	Adult	Promotional Product	\$65.25	New product
FlexPass Zone 1A	Reduced	Not offered	\$9.90	New product
FlexPass Zone 1	Reduced	Not offered	\$29.25	New product

Fare Product	Rider Type	Existing Fare	Proposed Fare	Percent Change
FlexPass Zone 2	Reduced	Not offered	\$31.50	New product
FlexPass Zone 3	Reduced	Not offered	\$36.00	New product
FlexPass Zone 4	Reduced	Not offered	\$38.25	New product
FlexPass Zone 5	Reduced	Not offered	\$42.75	New product
FlexPass Zone 6	Reduced	Not offered	\$47.25	New product
FlexPass Zone 7	Reduced	Not offered	\$49.50	New product
FlexPass Zone 8	Reduced	Not offered	\$54.00	New product
FlexPass Zone 9	Reduced	Not offered	\$56.25	New product
FlexPass Zone 10	Reduced	Not offered	\$58.50	New product
FlexPass Interzone 1	Reduced	Not offered	\$11.25	New product
FlexPass Interzone 2	Reduced	Not offered	\$13.50	New product
FlexPass Interzone 3	Reduced	Not offered	\$15.75	New product
FlexPass Interzone 4	Reduced	Not offered	\$18.00	New product
FlexPass Interzone 5	Reduced	Not offered	\$20.25	New product
FlexPass Interzone 6	Reduced	Not offered	\$22.50	New product
FlexPass Interzone 7	Reduced	Not offered	\$24.75	New product
FlexPass Interzone 8	Reduced	Not offered	\$27.00	New product
FlexPass Interzone 9	Reduced	Not offered	\$29.25	New product
FlexPass Interzone 10	Reduced	Not offered	\$31.50	New product
Ferry				
Charlestown Ferry (mTicket)	Adult	\$80.00	\$80.00	0%
Commuter Ferry (mTicket)	Adult	\$329.00	\$329.00	0%
Commuter Ferry (mTicket)	Adult	\$319.00	\$319.00	0%
Commuter Ferry (mTicket)	Reduced	Not offered	\$164.00	New product
Commuter Ferry (mTicket)	Reduced	Not offered	\$159.00	New Product

Source: MBTA.