



**Massachusetts Bay
Transportation Authority**

Forging Ahead: Scenario and Service Planning

Fiscal and Management Control Board

September 21, 2020

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Agenda

- How we plan to address scenario planning and uncertainty
- Understanding the potential range of needed savings
- Defining transit critical areas and transit propensity
- Defining access and service quality
- Discussion of trade-offs within the framework



The crisis is creating fiscal challenges for all transit agencies, not just the MBTA

- Due to the work the MBTA has done over the past 5 years to shore up its finances and the plans to move flexible capital funds, we have time to plan
- We can use this time to make sure we can preserve our core service and create the foundation for the recovery of both ridership and revenues.

- **New York's MTA** is projecting a budget loss for this year of about \$3.8B (22%) and a larger loss of \$6.6B (38%) next year as ridership declines of over 90% may require decreased service and increased fares absent any additional federal funding
- **Philadelphia's SEPTA** is looking at upwards of \$300M in lost revenue through mid-2021 and has already eliminated about half of its bus and trolley routes, closed 18 subway stations, and cut service entirely on six Regional Rail lines as it now gradually adds back service (normal schedule timeline still not set)
- **San Francisco's SFMTA** is planning for a \$200M loss in the latest budget that would translate into 40 of 68 bus lines being cut, possibly permanently, after being put on hiatus at the beginning of the shelter-in-place order
- **Los Angeles Metro** is projecting revenue loss of \$730 million and is proposing to keep service at 81% of pre-COVID levels through June 2021

Scenario Planning: how we plan to address uncertainty

- We are working with MassDOT planning and OPMI and CTPS to develop three versions of the short (1 year) and medium-range (2-3 years) future scenarios to guide service and capital decisions
 - The scenarios will make different assumptions about the pace of economic recovery projections, the durability of telework and changes in travel patterns, as well as the length of the pandemic
- In the short-term the scenarios will be used to recast the range of potential FY22 fare revenue projections and evaluate ridership propensity to return
- This will be an iterative process, with the scenarios updated as new information becomes available so that they can continue to be used to shape capital investments as well as future service planning decisions
 - The MBTA makes service changes quarterly for bus/rapid transit, twice a year for commuter rail
- The initial version of the short-term scenarios will be presented to the Board on Oct 19th



Estimating the Potential Range of Needed Budget Savings

- We must plan for a range of potential futures/scenarios as the return of ridership largely depends on future external events and therefore the projected budget deficit remains highly uncertain. The Scenario planning will inform our decisions.
- Closing deficits can be done with a combination of maximizing revenue (both own source and potential additional federal funding), allocation of capital funding and savings initiatives, as well as service changes
- The next two slides are included to help lay out the potential range of needed budget savings from service changes in different scenarios, making certain assumptions about likely revenue and the magnitude of non-service related savings
- Savings from service changes will need to come from the \$1.19 billion portion of the MBTA budget that roughly represents

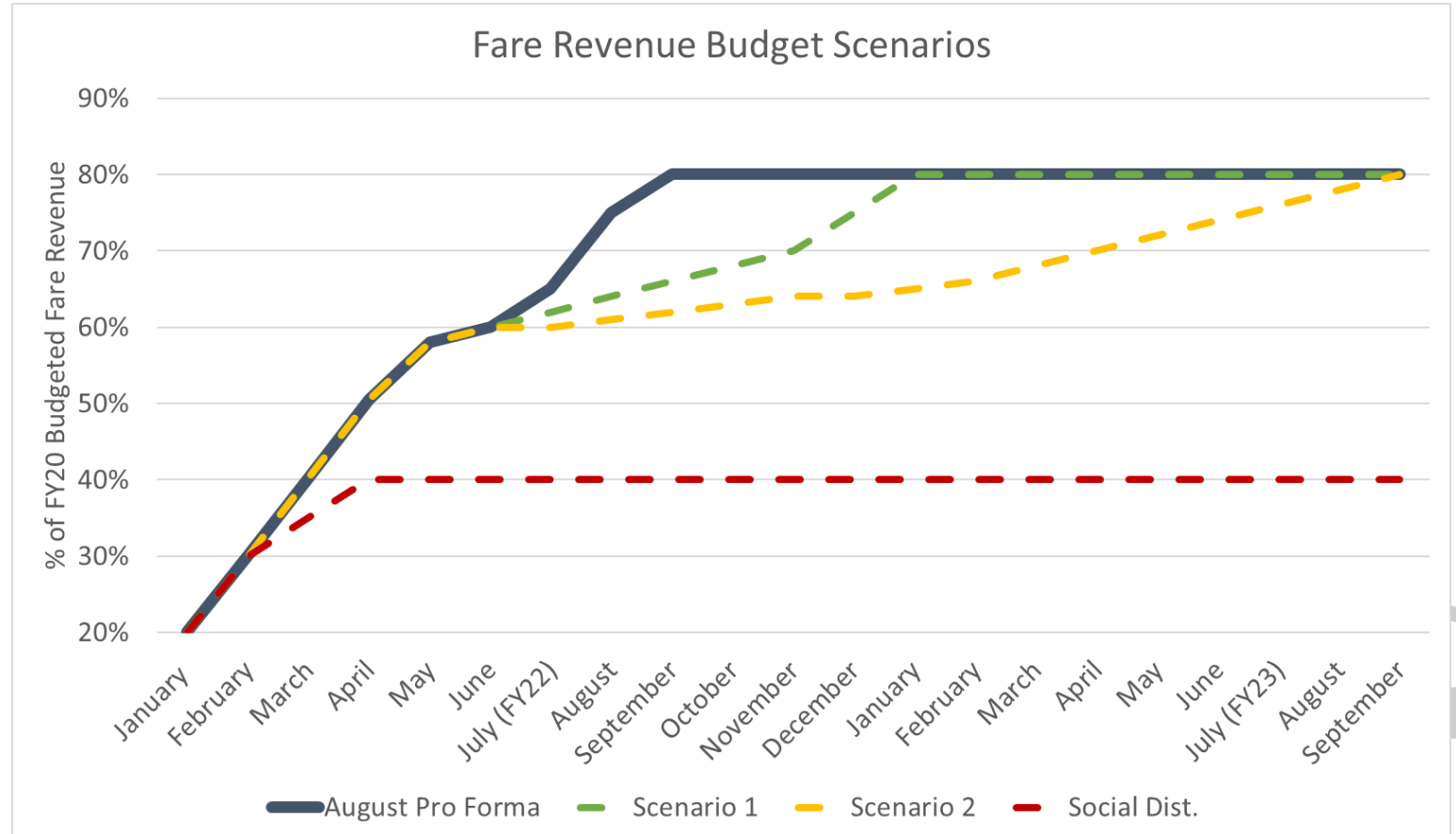


The Four Budget Scenarios

Numbers may change as all assumptions and variables are subject to revision as the authority receives new or updated information

- The four budget scenarios are based upon and driven by fare revenue models
 - August Pro Forma assumes 60% by June 2021 (end of FY21) ramping up to 80% by September 2021
 - Scenario 1 assumes 60% by June 2021 (end of FY21) increasing to 80% by January 2022
 - Scenario 2 assumes 60% by June 2021 (end of FY21) increasing to 80% by September 2022
 - Social Distancing Model assumes 40% by April 2020 and remaining level

Budget Scenarios				
Month	August Pro Forma	Scenario 1	Scenario 2	Social Dist.
January	20%	20%	20%	20%
February	30%	30%	30%	30%
March	40%	40%	40%	35%
April	51%	51%	51%	40%
May	58%	58%	58%	40%
June	60%	60%	60%	40%
July (FY22)	65%	62%	60%	40%
August	75%	64%	61%	40%
September	80%	66%	62%	40%
October	80%	68%	63%	40%
November	80%	70%	64%	40%
December	80%	75%	64%	40%
January	80%	80%	65%	40%
February	80%	80%	66%	40%
March	80%	80%	68%	40%
April	80%	80%	70%	40%
May	80%	80%	72%	40%
June	80%	80%	74%	40%
July (FY23)	80%	80%	76%	40%
August	80%	80%	78%	40%
September	80%	80%	80%	40%



Budget Savings Scenarios

Focus on Service Level Planning

- For service level planning purposes, the table below models the targeted amounts required

FY21 & FY22 Budget Gap & Options Summary	August Pro Forma Estimate (80% by Sept. 2021)	Observed Social Distancing Scenario w/ level Capital Shift (40% by April 2021)	Observed Social Distancing Scenario w/ level Increased Capital Shift (40% by April 2021)
August Pro Forma Budget Gap	\$ (308)	\$ (577)	\$ (577)
<i>Capital Salaries</i>	\$ 134	\$ 134	\$ 134
<i>Federal Formula Funds</i>	\$ 160	\$ 160	\$ 280
Capital Funding Reallocation Subtotal	\$ 294	\$ 294	\$ 414
<i>Non-Service Programmatic Savings</i>	\$ 60	\$ 60	\$ 60
<i>Target for Service Level Savings</i>	\$ 60	\$ 255	\$ 150
Department & Programmatic Savings Subtotal	\$ 120	\$ 315	\$ 210
Target Subtotal	\$ 414	\$ 609	\$ 624
Options vs. Gap (\$)	\$ 106	\$ 32	\$ 47
Gap as a % of Options	74%	95%	92%
Options vs. MBTA Target (\$400M)	\$ 14	\$ 209	\$ 224

- Risks**

- Fare Revenue reduction FY21 Q3 & Q4
- Maintenance costs increase due to deferred capital work
- Capital Salary Legislation not enacted
- Complication and delay in implementation
- Unknown unknowns



Budget Savings Scenarios FY21 & FY22 breakout

August Pro Forma Estimate (80% by Sept. 2021)			
Budget Gap & Options Summary	FY21	FY22	TOTAL
August Pro Forma Budget Gap	\$ -	\$ (308)	\$ (308)
<i>Capital Salaries</i>	\$ 67	\$ 67	\$ 134
<i>Federal Formula Funds</i>	\$ 80	\$ 80	\$ 160
Capital Funding Reallocation Subtotal	\$ 147	\$ 147	\$ 294
<i>Non-Service Programmatic Savings</i>	\$ 20	\$ 40	\$ 60
<i>Target for Service Level Savings</i>	\$ -	\$ 60	\$ 60
Department & Programmatic Savings Subtotal	\$ 20	\$ 100	\$ 120
Target Subtotal	\$ 167	\$ 247	\$ 414
Options vs. Gap (\$)	\$ 167	\$ (61)	\$ 106
Gap as a % of Options	0%	125%	74%
Options vs. MBTA Target (\$400M)	\$ (233)	\$ (153)	\$ 14

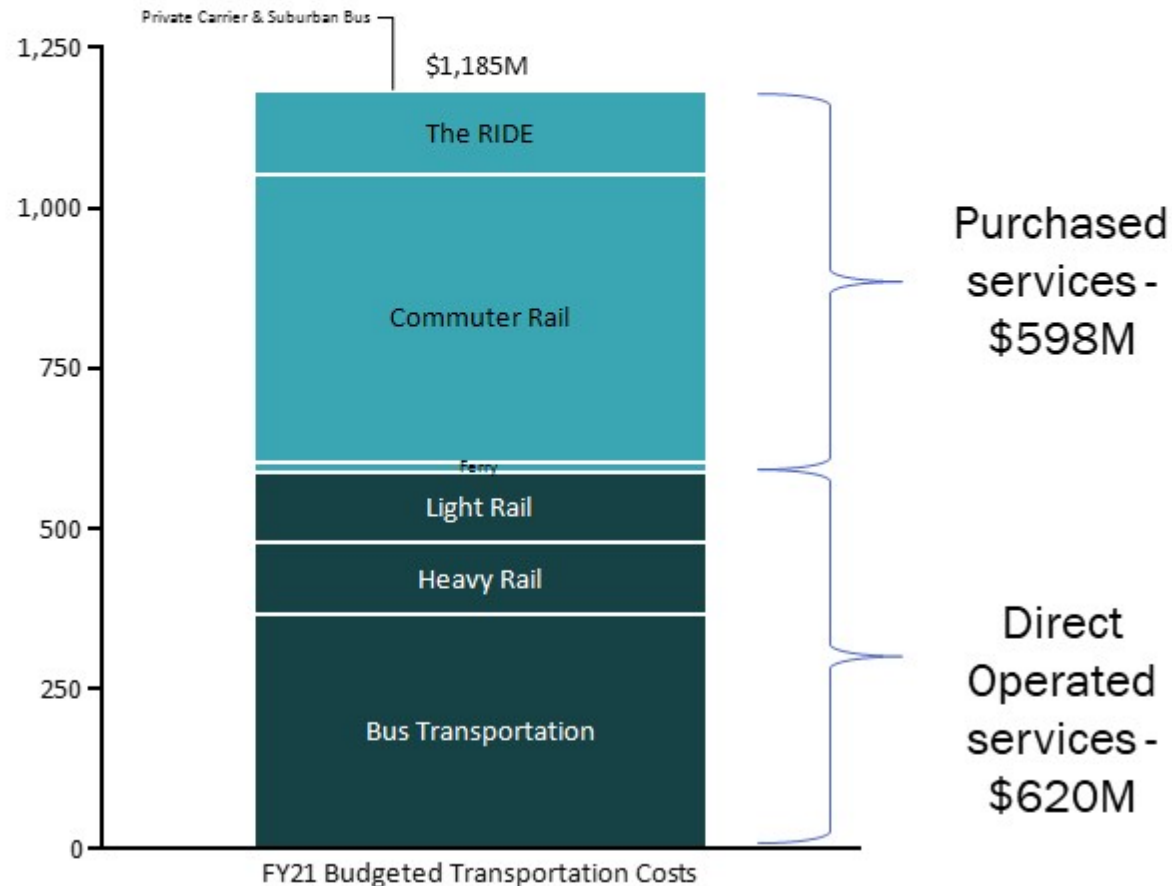
Observed Social Distancing Scenario w/ level Capital Shift (40% by April 2021)			
Budget Gap & Options Summary	FY21	FY22	TOTAL
August Pro Forma Budget Gap	\$ -	\$ (577)	\$ (577)
<i>Capital Salaries</i>	\$ 67	\$ 67	\$ 134
<i>Federal Formula Funds</i>	\$ 80	\$ 80	\$ 160
Capital Funding Reallocation Subtotal	\$ 147	\$ 147	\$ 294
<i>Non-Service Programmatic Savings</i>	\$ 20	\$ 40	\$ 60
<i>Target for Service Level Savings</i>	\$ -	\$ 255	\$ 255
Department & Programmatic Savings Subtotal	\$ 20	\$ 295	\$ 315
Target Subtotal	\$ 167	\$ 442	\$ 609
Options vs. Gap (\$)	\$ 167	\$ (135)	\$ 32
Gap as a % of Options	0%	131%	95%
Options vs. MBTA Target (\$400M)	\$ (233)	\$ 42	\$ 209

Observed Social Distancing Scenario w/ level Increased Capital Shift (40% by April 2021)			
Budget Gap & Options Summary	FY21	FY22	TOTAL
August Pro Forma Budget Gap	\$ -	\$ (577)	\$ (577)
<i>Capital Salaries</i>	\$ 67	\$ 67	\$ 134
<i>Federal Formula Funds</i>	\$ 80	\$ 200	\$ 280
Capital Funding Reallocation Subtotal	\$ 147	\$ 267	\$ 414
<i>Non-Service Programmatic Savings</i>	\$ 20	\$ 40	\$ 60
<i>Target for Service Level Savings</i>	\$ -	\$ 150	\$ 150
Department & Programmatic Savings Subtotal	\$ 20	\$ 190	\$ 210
Target Subtotal	\$ 167	\$ 457	\$ 624
Options vs. Gap (\$)	\$ 167	\$ (120)	\$ 47
Gap as a % of Options	0%	126%	92%
Options vs. MBTA Target (\$400M)	\$ (233)	\$ 57	\$ 224

- Service Level savings, following a public process this fall and implementation process this coming spring, conservatively assumes savings will be achieved in FY22, however, to the extent feasible, if changes to transit can be implemented in FY21, some savings could be moved forward into FY21.



Portion of the MBTA Budget that represents direct costs for Service Operations



- Transportation services represent close to \$1.19B of MBTA operating expenses across all modes
- Direct Operated services include transportation and vehicle maintenance (incl. fuel), but not any infrastructure maintenance
- Purchased services include total annual contract value
- Not all costs shown are variable



Defining Our Essential Services

Based on two analyses:

- Where are the trips made by transit critical populations
- Where we have high ridership now or are likely to in the next year or two

	Serving high transit critical population	Serving low transit critical population
Higher ridership (current or propensity)	Preserve or enhance service / access <i>(though individual trips may still be affected)</i>	Consider trade-offs depending on budget availability
Lower ridership (current or propensity)	Consider trade-offs depending on budget availability	Most likely to reduce service levels

This process is designed to create an equitable network that preserves access and quality of service available to transit critical populations (low-income, people of color, seniors, people with disabilities, and no to low vehicle households).



Visualizing the Essential Services: the Data

Where are the transit critical populations traveling?

- We are augmenting Census data of transit critical households with trip-making during the pandemic because we know that the demographics on our services are different than the census tracts they travel through
- Data sources: Census and Streetlight data of trip-making
- What are the high ridership and propensity for ridership return services?
 - We are combining current ridership and ridership return rates with an analysis to project where we think riders are most likely to return in the short-term
 - Data sources: ridership, employer panel survey, customer panel survey, demographics of pre-COVID riders, existing MBTA research on bus ridership, scenarios, data from peer agencies



Visualizing the Essential Services: the Analysis

- The analysis will be done at the line/route level or in some cases corridors
 - For example, we will look at the stations between Boston and Beverly separate from the Rockport and Newburyport lines
- We will create a map of the essential service area
- Analysis will be presented to the FMCB on October 5

Vehicles per Household Size by Rail Line

CR and Rapid Rail Lines	Zero cars	< .5 cars per person
Red	27%	44%
Orange	25%	43%
Green	36%	50%
Blue	32%	50%
Newburyport/Rockport	7%	20%
Haverhill	5%	15%
Lowell	3%	16%
Fitchburg	10%	22%
Worcester	7%	18%
Needham	4%	21%
Franklin	3%	15%
Providence	4%	12%
Fairmount	15%	39%
Middleborough	5%	16%
Kingston/Plymouth	2%	16%
Greenbush	1%	14%

Source: 2015-2017 systemwide passenger survey

Defining service quality

- The Service Delivery Policy has two types of service metrics
 - Access to service: span and geographic coverage
 - Service quality: frequency

	Serving high transit critical population	Serving low transit critical population
Higher ridership	Goal to maintain Service Delivery Policy standards, maintaining service quality <i>(though individual trips may change)</i>	Decrease service quality and/or access
Lower ridership	Decrease service quality and/or access	End access or decrease service quality

Network level measures for competitive trip coverage and regional access will be used to evaluate the packages

Where are the trade-offs

Analysis will be done at the bus route/corridors, rapid transit lines, commuter rail lines/corridors, ferry routes, and overall RIDE service area

	Serving high transit critical population	Serving low transit critical population
Higher ridership (current or propensity)	Preserve or enhance service / access <i>(though individual trips may still be affected)</i>	Consider trade-offs depending on budget availability
Lower ridership (current or propensity)	Consider trade-offs depending on budget availability	Most likely to reduce service levels

Where to apply trade-offs in order to preserve essential service

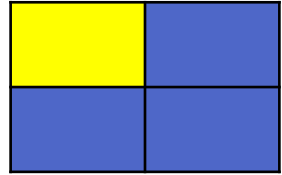


Importance of trade-offs

- While starting from perspective of preserving essential service, we can't ignore trade offs
- If we want to preserve or improve parts of the system, it will make something worse for someone
- If we cut service, we will have choices to make on how we cut
- These are policy decisions with no “right answer”



“Top-Left” Example – Preserve Essential Service



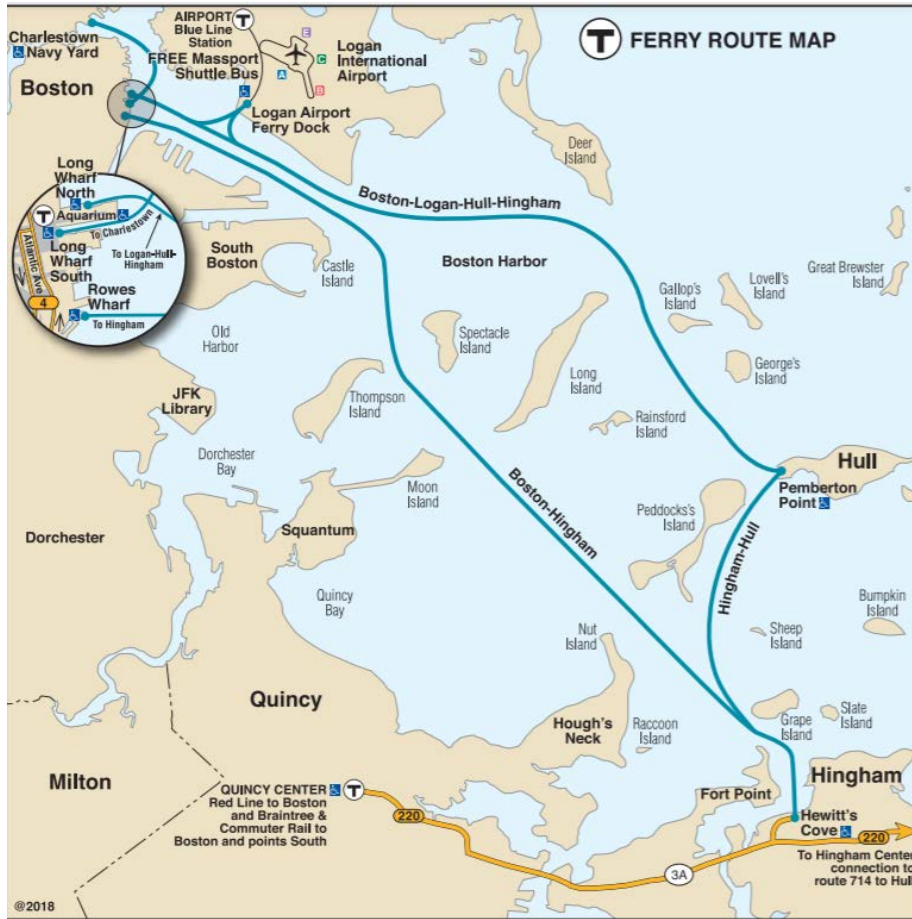
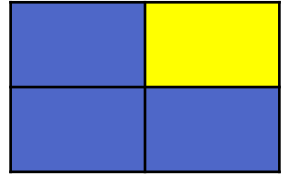
Rapid Transit Headways	Service Delivery Policy
AM & PM Peak	Every 10 minutes
All other weekday periods	Every 15 minutes
Saturday and Sunday	Every 15 minutes

Rapid Transit Span of Service	Service Delivery Policy
Weekday	6:00 AM - midnight
Saturday	6:00 AM - midnight
Sunday	7:00 AM - midnight

- **Service Delivery Policy sets “minimum” service to target for services in “top left” box**
- Individual trips might change
- Both frequency and span of service currently exceed Service Delivery Policy for many routes and rail lines
- Therefore some routes and rail lines may be able to preserve essential service and still either reduce frequency and/or decrease span of service



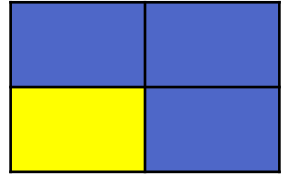
“Top-Right” Example – Mode switching or transfers



- Alternative service available for drive to transit customers
- Ferry characteristics
 - 4% Low Income
 - 2% Minority
 - 33% 0 to 1 car household
- Ferries may be considered higher ridership propensity, but low transit critical population
- If reduce or eliminate ferry service, alternative access to Greenbush Line (5-15 minute drive) for Hingham and Hull passengers
- Fare structure is comparable



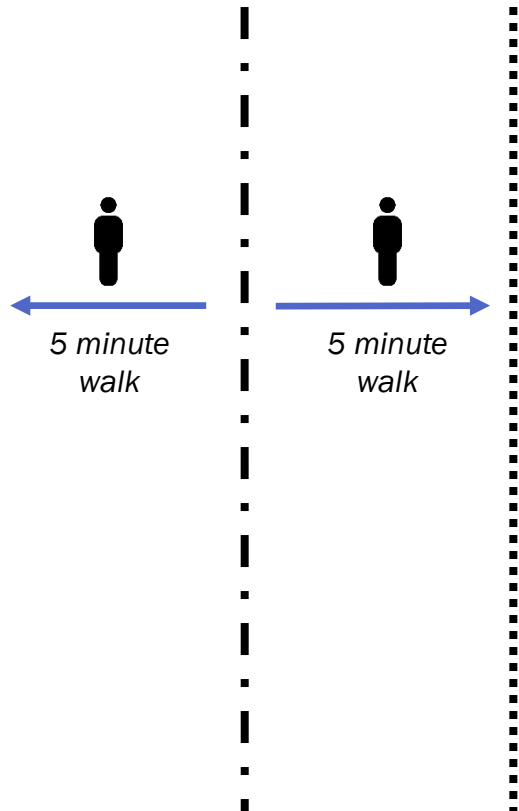
“Bottom-Left” Example – Increase walkshed to preserve quality service



Rapid Transit
High ridership
Every 10 minutes

Bus Route A
Low ridership
Every 30 minutes

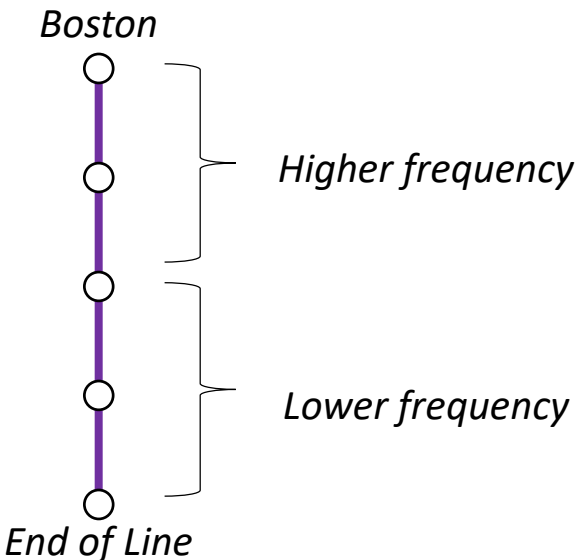
Bus Route B
High ridership
Every 10-15 minutes



- Access to quality service maintained by consolidating trips on single service, but may be accessed differently
- Illustrative Bus Route A
 - 29% Low Income
 - 43% Minority
 - 76% 0 to 1 car household
- High transit critical population, but low ridership bus route A
- If bus route A reduced or eliminated, riders would walk 5 minutes to either rapid transit and/or alternative high frequency bus route (Key Bus Route or similar)
- May also result in additional transfers or rapid transit fare



“Bottom-Right” Example – Decrease service and/or decrease access



- Decrease of service quality and/or loss of access to transit

• Illustrative Commuter Rail Line

- 7% Low Income
- 8% Minority
- 41% 0 to 1 car household

- If low ridership propensity at outer stations on a rail line but higher propensity at Gateway City or urban rail-type stations closer to Boston, can short-turn more trains to preserve service to inner stations while decreasing service to the end of line



Non-express bus route



Rapid Transit

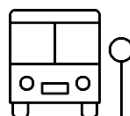


• Illustrative Express Bus Route B

- 10% Low Income
- 35% Minority
- 51% 0 to 1 car household



>0.5 miles



- Shorten or eliminate bus route if low critical transit and low ridership propensity. Riders may become >0.5 miles away from public transit or may still access transit via alternative routes/modes; may result in additional transfers

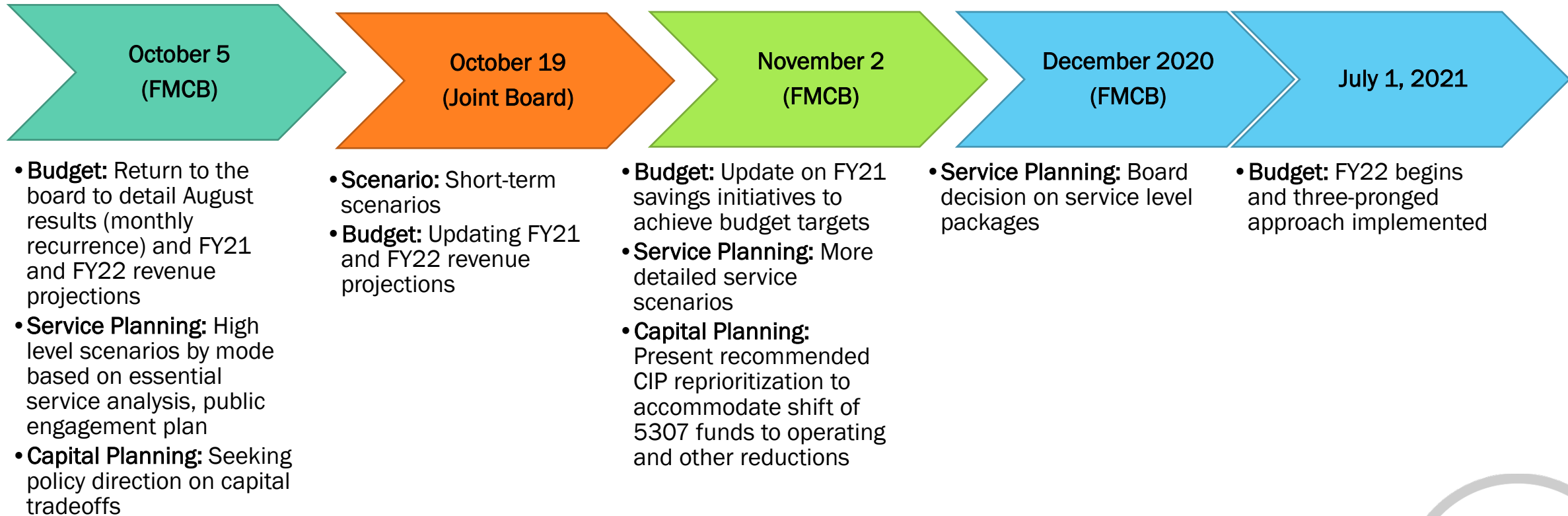


Summary of Potential Trade-offs

- Types of service changes for each quadrant (may not exhaustively represent every trade off in service packages ultimately presented)

	Serving high transit critical population	Serving low transit critical population
Higher ridership	Possible changes to span and frequency within Service Delivery Policy, changes to routes that preserves access	Access to different service for drive to transit customers, changes to frequency and span
Lower ridership	Longer walk to more frequent service May also result in additional transfers or changes to fares	Potential to end access within 1/2 mile, lower frequency and span

Timeline for Service, Budget, and Capital Updates



Appendix

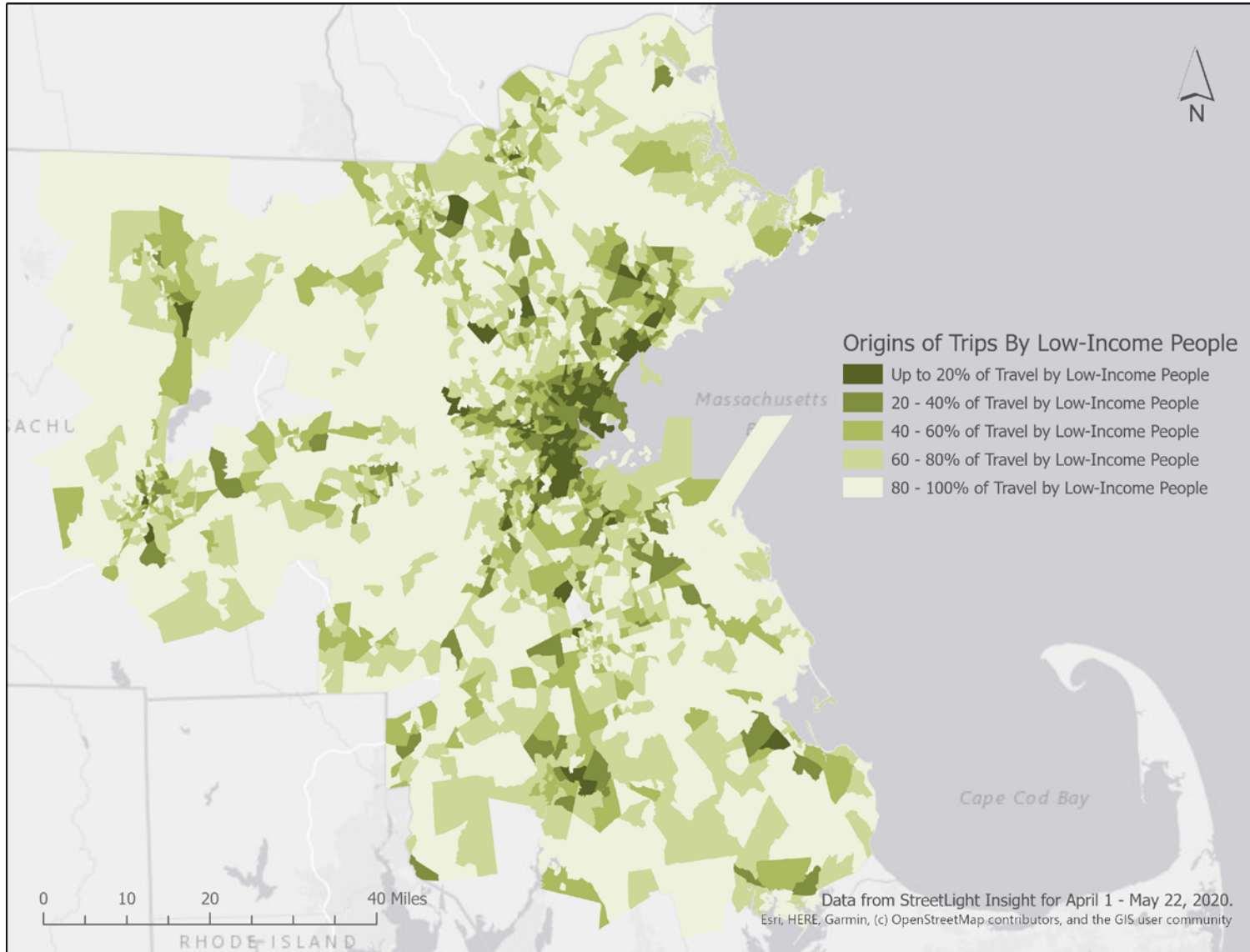


Appendix: Working Definitions

Transit critical	Low-income, people of color, seniors, people with disabilities, zero or low car households
Transit propensity	Likelihood of taking transit, based on demographics, land use and employment factors
Simpler	Easier to understand and/or predictable by riders, such as clockface departures, same frequency all day, and/or fewer variants
Equitable	Preserving access and quality of service available to transit critical populations
Redundancy	When the same or similar trip (potentially requiring a transfer), is provided by the same or different modes



Origin Locations of Trips by Low-Income People

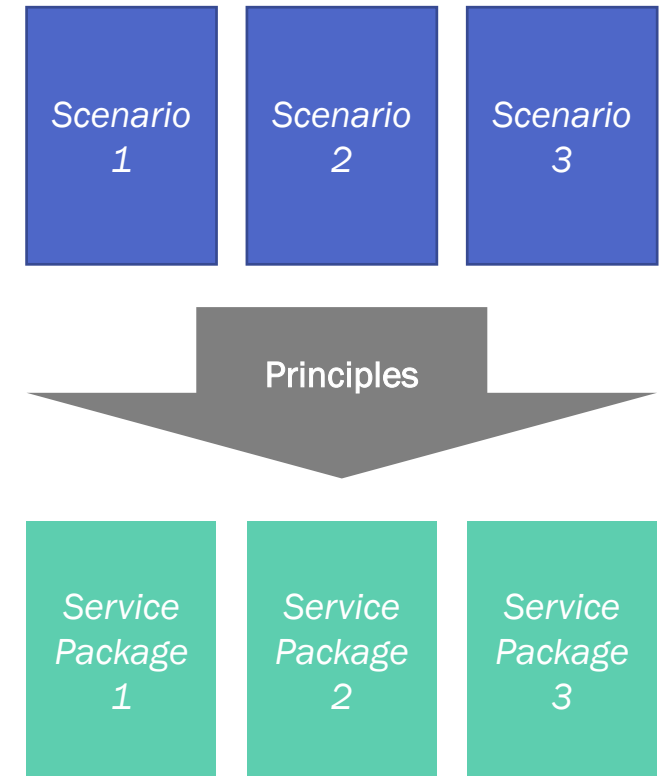


- Preliminary map of levels of low-income travel in the MBTA service area
- Does not account for ridership levels



Appendix: Service Principles: Trade-offs to Develop Service “Packages”

- Alignment on **principles** help us redesign service:
 - In the short-term to serve those who need us most
 - In the medium term as a foundation for recovery
 - Are scenario-agnostic, but help translate the scenarios into service plans
- **Principles answer three key questions:**
 - What people and places (or trips) are we prioritizing?
 - What kind of system do we want at the “end”, regardless of whichever scenario(s) is most likely?
 - What are acceptable service outcomes (based on decisions above)?



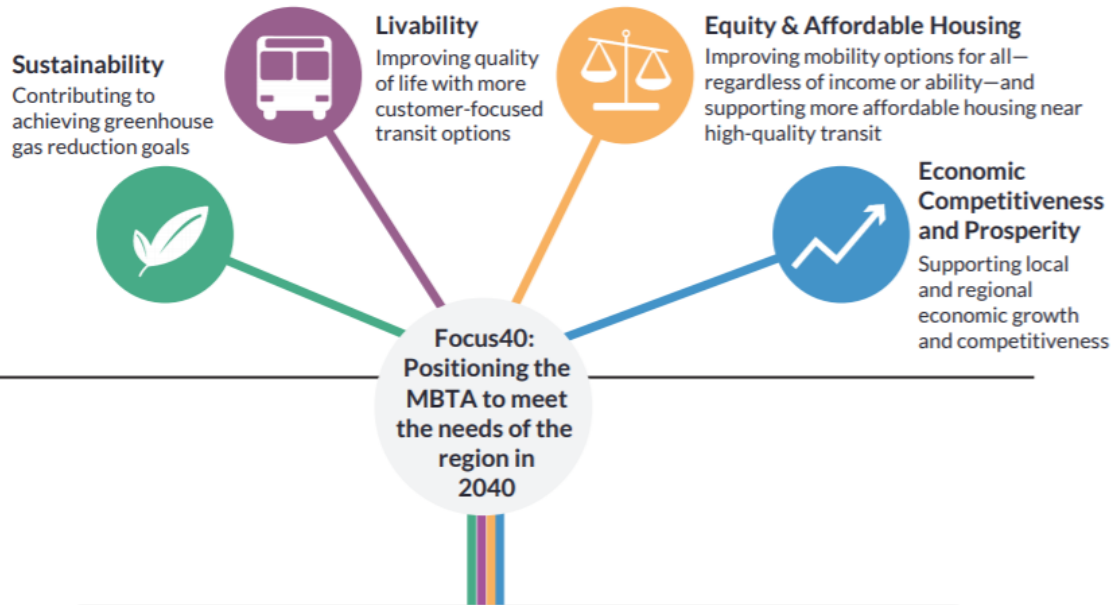
Appendix: Principles

Key question	Recommended Principle	Alternative (<i>not recommended</i>)
<p>What people and places are we prioritizing?</p>	<ul style="list-style-type: none"> • Existing and likely to return ridership, including durable ridership during COVID-19 and transit critical communities • Possible service level changes to all modes, but analyzed at the route and line level 	<ul style="list-style-type: none"> • Prioritize fare revenue or cost per passenger to drive decision-making • Exclude some mode(s) from service change analysis
<p>What kind of system do we want?</p>	<ul style="list-style-type: none"> • Simpler, less redundant, and more equitable system, which is therefore more resilient, efficient, and easier to use • Preserve/invest in quality service (frequency) in key areas instead of degraded service everywhere • These are permanent changes – if and when additional resources available, we <u>will not</u> recreate the pre-COVID system 	<ul style="list-style-type: none"> • Target same % reduction across all modes, lines and/or routes • Try to maintain existing network structure in long term

Does the Board agree with the Recommended Principles? Are there any additional principles to add?

Appendix: Selected Goals/Objectives from previous work

Focus40 Goals



To Serve the Needs of the Region the MBTA must be:

Reliable

Providing service that is safe, on-time, and high quality for customers of all ages and abilities

Robust

Providing service that has the capacity to take people where they want to go as demand for transit increases

Resilient

Providing service that is built to last through extreme weather and other disruptions

Rail Vision Objectives

1. Match service with growth & changing needs of the region
2. Enhance economic vitality
3. Improve passenger experience
4. Provide an equitable and balanced suite of investments
5. Achieve climate change and sustainability targets
6. Maximize return on investments

