



**Massachusetts Bay
Transportation Authority**

Bus Transformation Update: Bus Network Redesign

Fiscal and Management Control Board

November 23, 2020

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Overview

- The Bus Network Redesign has continued and made progress since we last presented to the Board
- We have learned about new or underserved destinations and identified key corridors for high frequency service (High Priority Corridors)
- The Bus Network Redesign will help the MBTA rebuild
- The Bus Network Redesign is part of a larger Bus Transformation effort



Four Bus Transformation Initiatives

Bus Procurements

Continue investing in the bus fleet by replacing old fleets on a consistent schedule in order to maintain a safe and reliable bus service (includes continued assessment of future technologies)

Bus Facilities

Increase investment in aging and outdated facilities to accommodate modern buses and support fleet wide electrification, while improving conditions for our workforce

Bus Transit Priority

Partnering with cities and towns to prioritize the movement of people instead of vehicles on congested streets

Bus Network Redesign

Complete re-imagining of the network to reflect regional travel needs and create more competitive service for current and future riders

Why the Bus Network Redesign is still important today

1. The Redesign focuses on examining all trip-making patterns in the region, regardless of mode or existing MBTA service. → **This approach helps to validate the MBTA's Forging Ahead assessment of what the most essential trips are**
2. The analysis has identified “High Priority Corridors” that warrant high frequency service → **This analysis helps identify where the MBTA should prioritize bus infrastructure investments**
3. The Redesign is focused on MBTA bus service for the future → **Service is part of the larger vision to transform the bus network**
4. The Redesign will develop a vision for the longer-term bus network → **The Redesign will help the MBTA rebuild**



What does the Bus Network Redesign help accomplish?

1. Create a **more equitable network** that connects people, in particular low income people, people of color, and people with disabilities, to where they need and want to go with a high quality transit option
2. Design a **more logical system** that is more adaptable to change
3. Create a **framework for a future bus network that can be implemented over time.**
4. Identify **High Priority Corridors** that merit high frequency service and guide future investments
5. Identify **new or underserved destinations** to better serve with transit
6. Create **metrics that are flexible, data-driven, and assess service quality** so that as the region evolves, so will the bus network



All this is still relevant.



Now, the Redesign helps us rebuild

We are in a different world than when we started.

- We have to adjust the network now to fit within our budget
- But we still want to create a better network and fix what didn't work before COVID-19

We can use the Redesign as a foundation to restructure the longer-term network and then bring back something better as resources become available.



New tools will help us evaluate and adjust.



Review: current project timeline

FALL 2020	WINTER 2021	SPRING 2021	SUMMER 2021	FALL 2021	WINTER 2022	SPRING 2022	SUMMER 2022
Identify High Priority Corridors	Finalize High Priority Corridors	Develop network alternatives to discuss policy trade-offs	Outreach on network alts	Develop draft network structure and phased implementation plan	Outreach on draft network structure and phased implementation plan	Outreach continues Develop final network structure and phased implementation plan (including Title VI Analysis)	Implementation will be phased over 3-5 years but could start Summer 2022
			FMCB decision on preferred alternative		MBTA Board input on draft rec. before public input & after	MBTA Board vote to adopt new bus network structure to be implemented over time	

This decision will guide us on how to allocate resources to the network.

This will adopt a network structure; exact frequencies and spans of service, as well as phasing, will be determined based on resources.

We've made a lot of progress on the Redesign

- **Designed network-level metrics**
 - Measures service quality: The % of region's trips that have a competitive transit option
 - Access to key destinations: The % of region's residents that can reach their local and regional destinations with a competitive transit option
 - Impacts of frequency, transfers, walk distance, travel time
 - Examines new ways of measuring equity trips that go beyond Title VI by analyzing where low-income populations and communities of color travel, not just where they live
- **Staff consensus on network principles**
- **Completed analysis of travel demand** through new location-based services dataset and Bus Analysis Zone tool
- **Developed online engagement tools** for meaningful public input on metrics to be used in 2021
- **Engaged relevant MBTA departments**
- **Created draft "High Priority Corridors" map** and started initial discussions on transit priority



Approach to designing a new network: corridors to routes

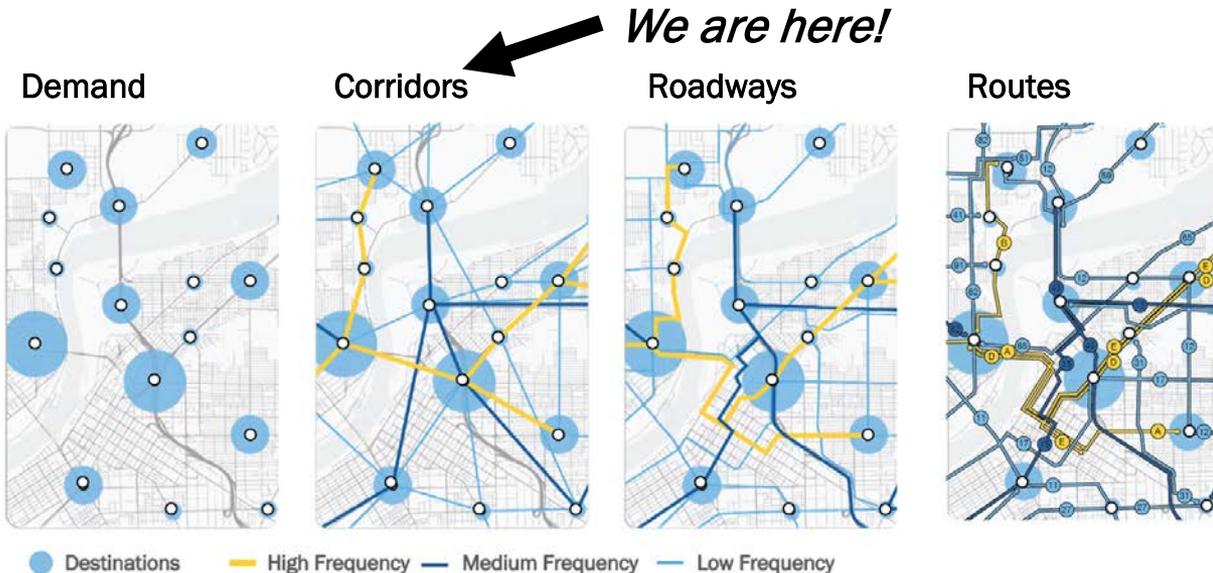
Travel demand data (location based services data) is being used to assess travel in the region.

Corridors connect areas of demand.

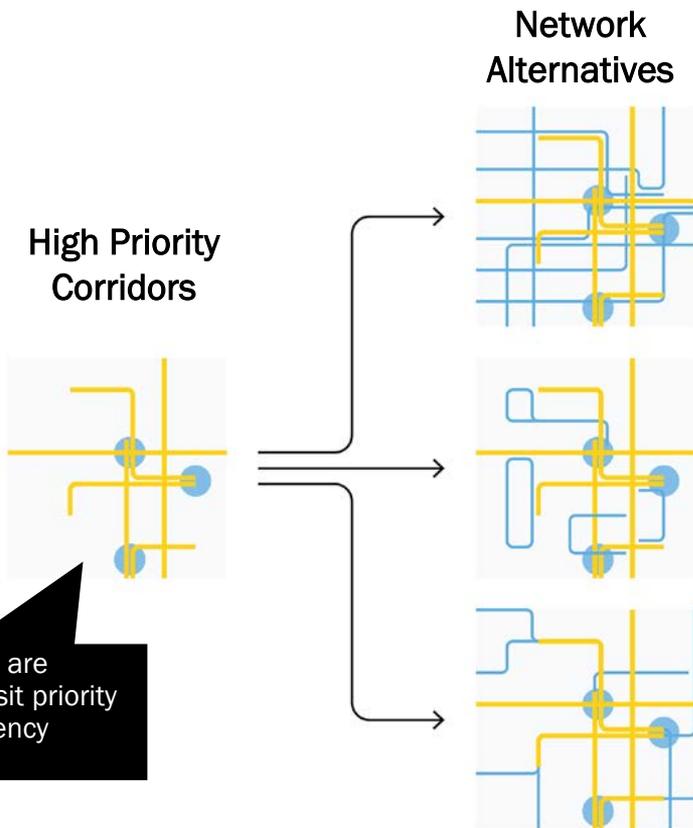
Corridors with high travel demand made by transit critical populations are identified as **High Priority Corridors** that warrant high frequency service.

Corridors are applied to **roadways** to identify where to prioritize investments in bus infrastructure.

Routes are the service that run in corridors. Corridors with bus infrastructure can be shared by multiple routes in order to optimize investments and improve connections.



High Priority Corridors are the first step in redesigning the entire network



High Priority Corridors are coordinated with transit priority to achieve high frequency service

High Priority Corridors cover 79% of essential trips*

As we continue with Bus Network Redesign, we will examine what the best structure for neighborhood service is in order to integrate other essential trips into the network

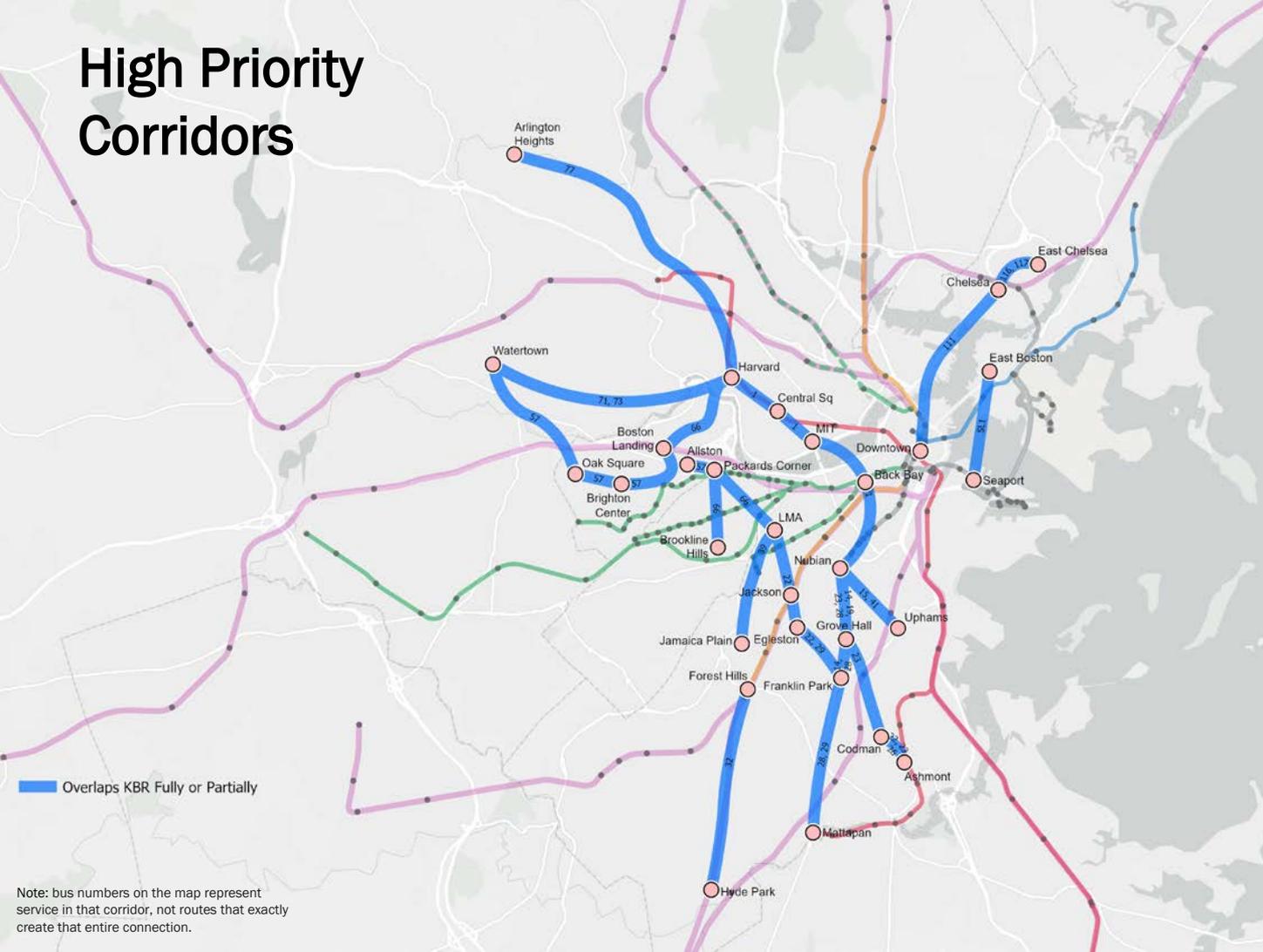
Core network of High Priority Corridors exist under any future Network Redesign

*Essential Trips are defined as part of Forging Ahead:
<https://www.mbta.com/forging-ahead>



High Priority Corridors

Some of these corridors already have high frequency service

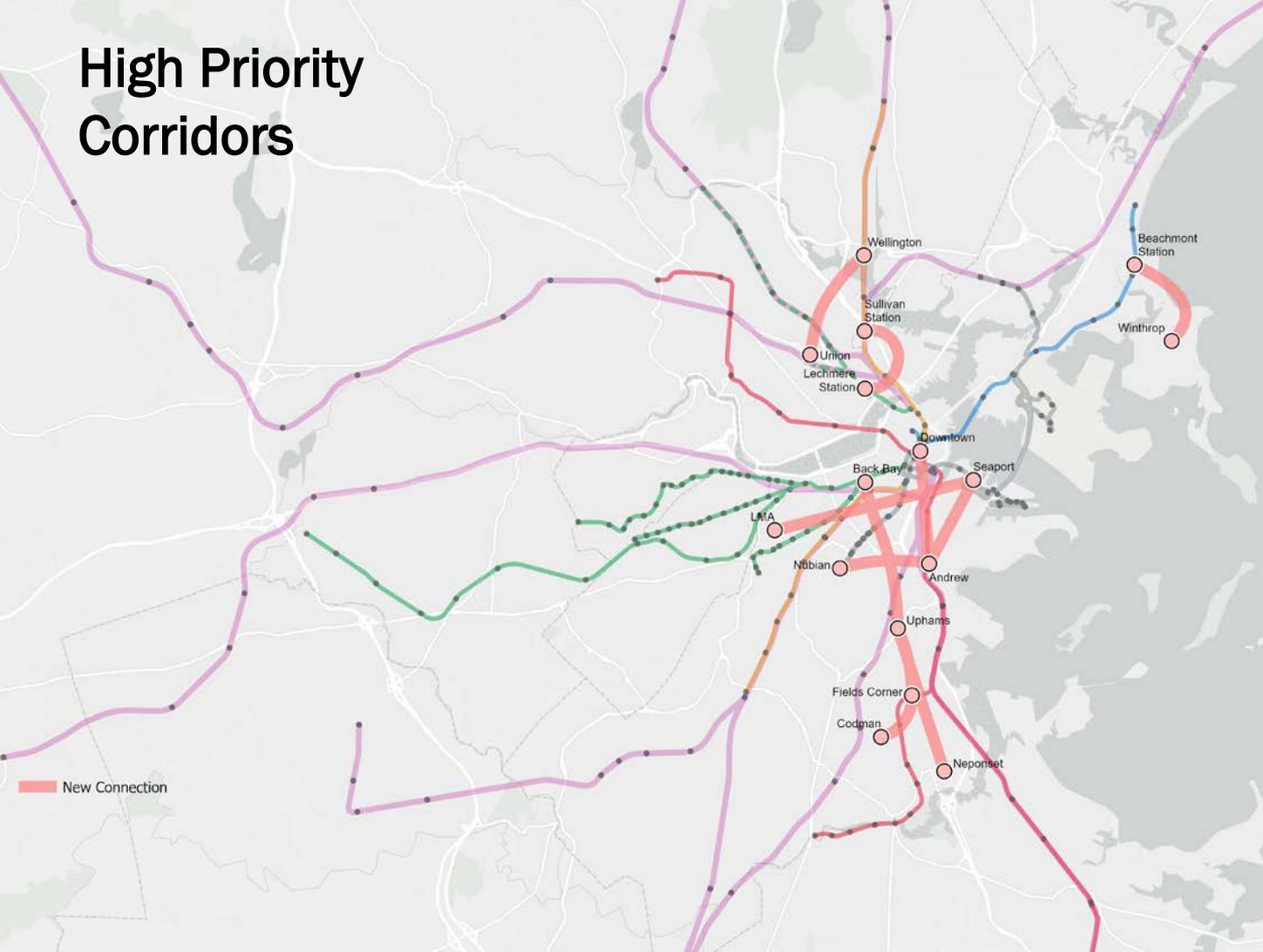


Overlaps KBR Fully or Partially

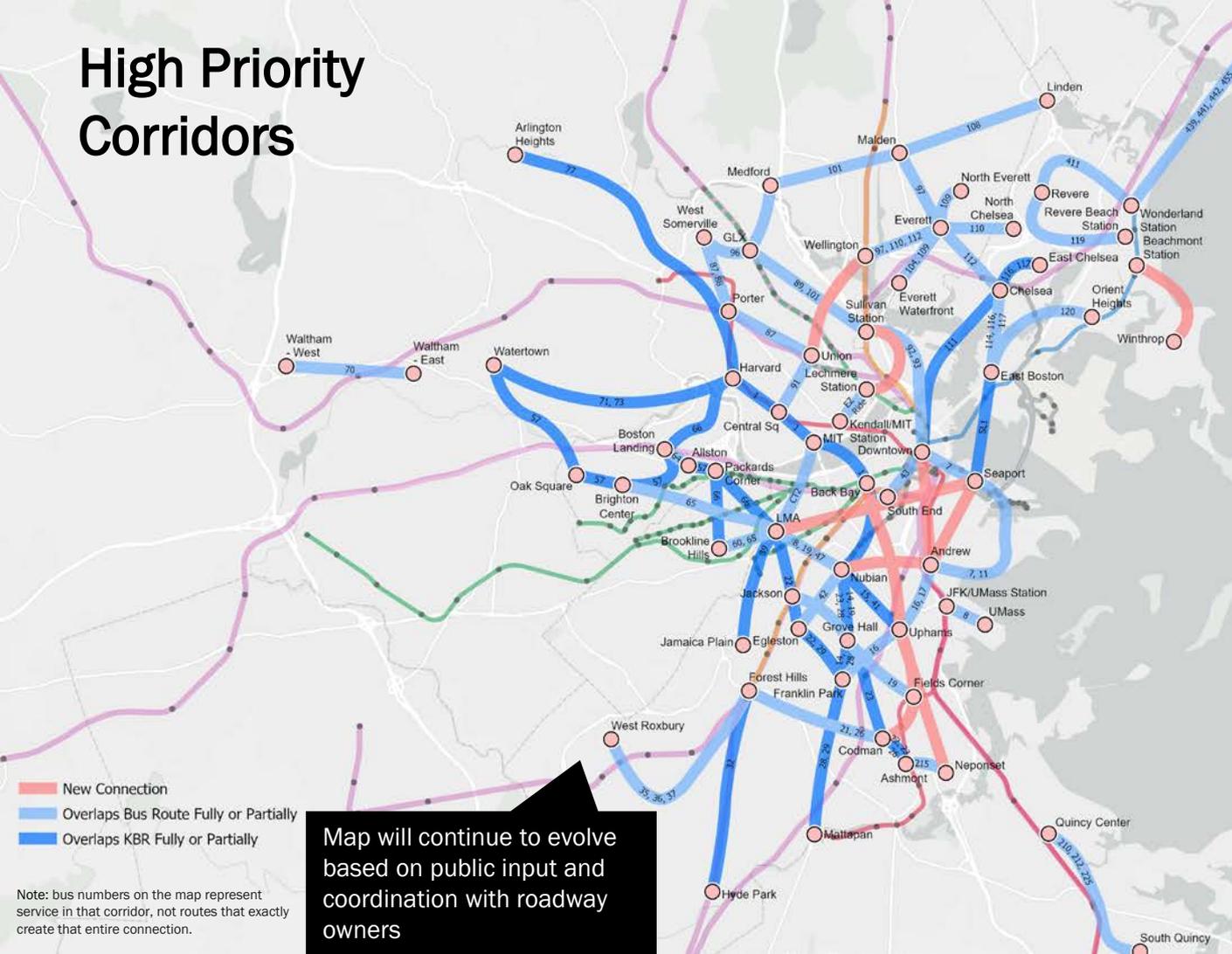
Note: bus numbers on the map represent service in that corridor, not routes that exactly create that entire connection.

High Priority Corridors

Some corridors are entirely new connections



High Priority Corridors



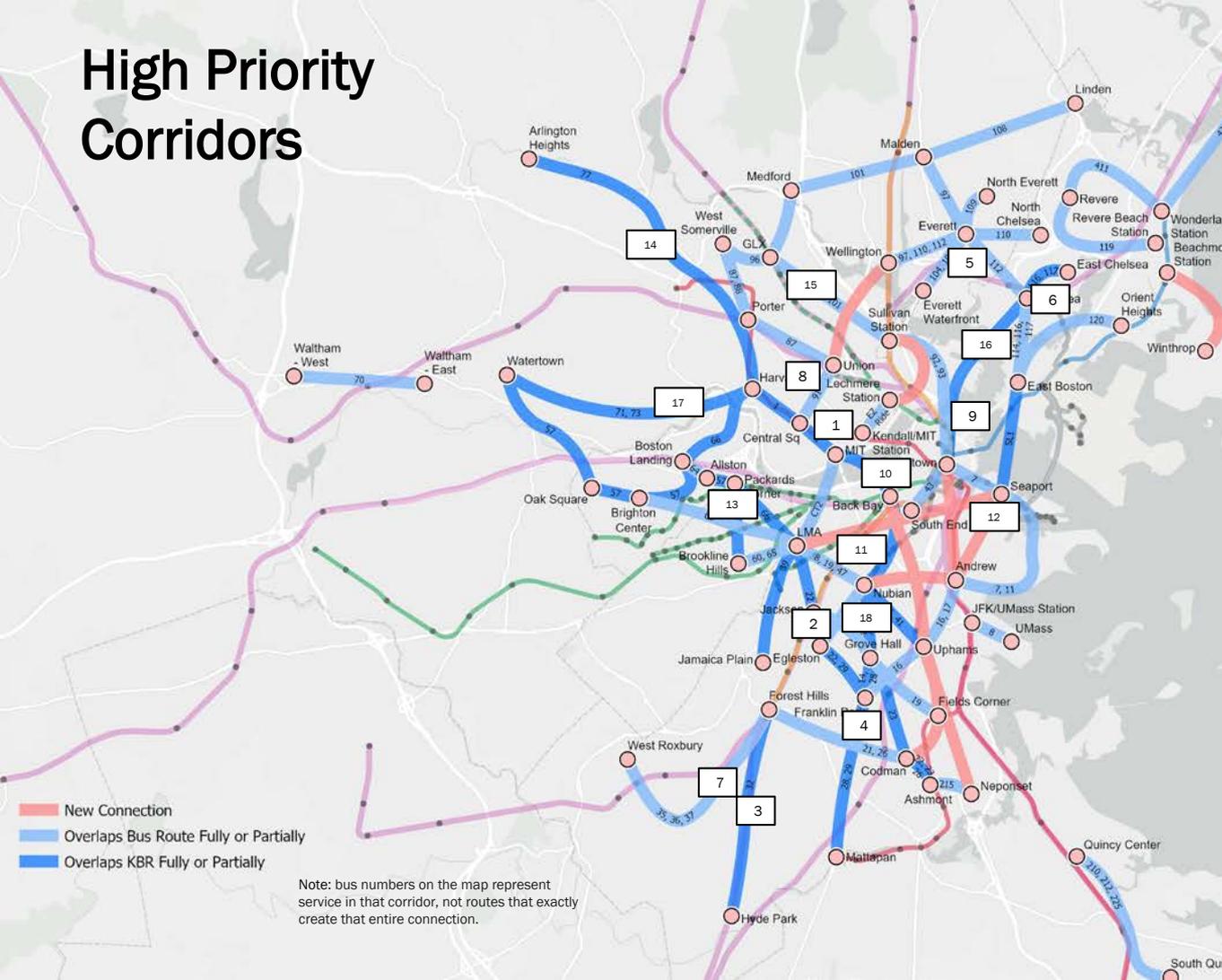
The High Priority Corridors help prioritize investments

- These would not all be implemented at once, and we can prioritize based on value of each corridor to the network
- These corridors would provide better service for transit critical populations since the analysis prioritizes travel made by communities of color and low-income populations.

Map will continue to evolve based on public input and coordination with roadway owners

Note: bus numbers on the map represent service in that corridor, not routes that exactly create that entire connection.

High Priority Corridors

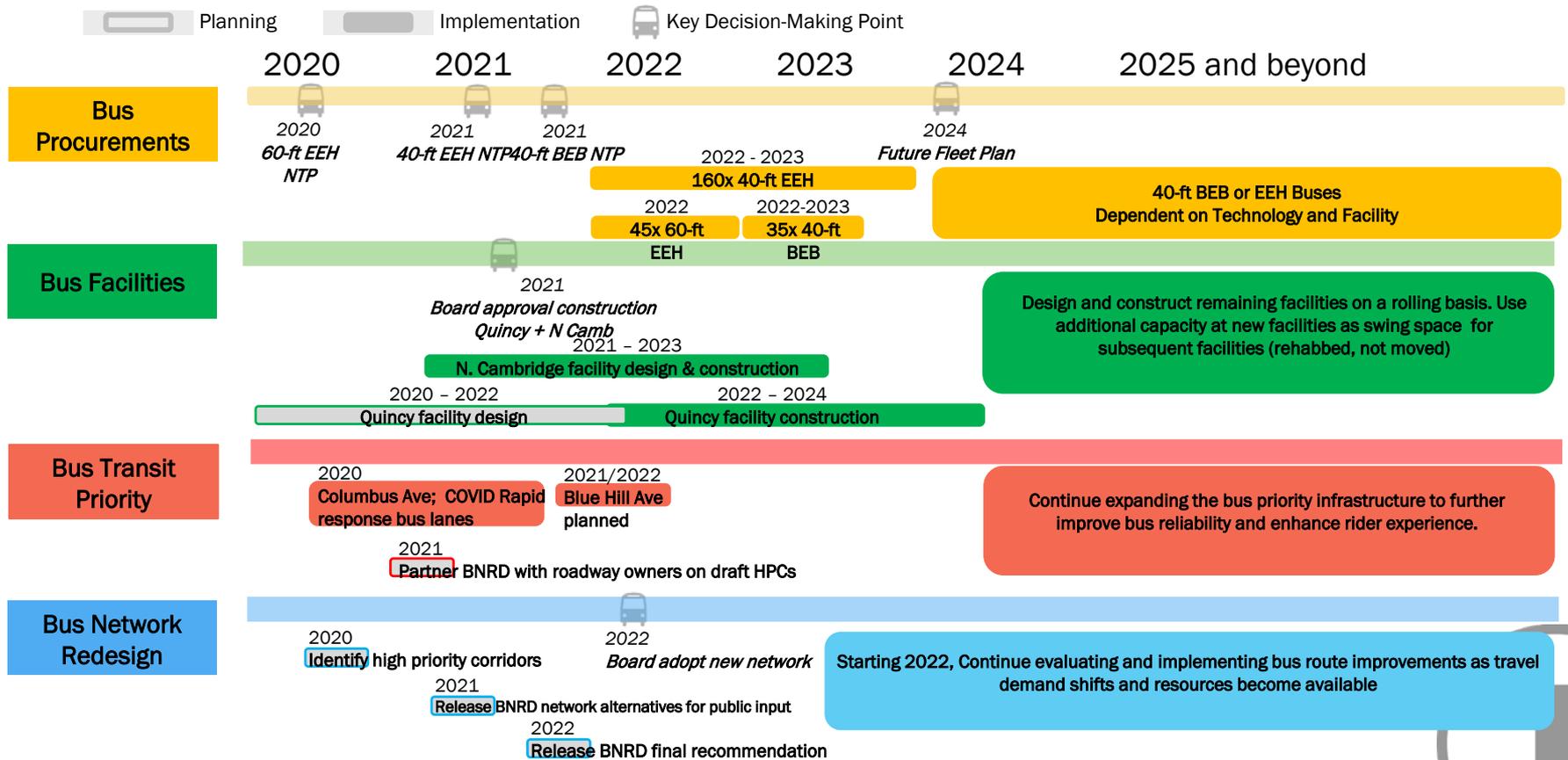


The current transit priority work supports build out of this vision

Current transit priority projects

1. Mass Ave - Cambridge
2. Columbus Ave Corridor
3. Hyde Park Ave
4. Blue Hill Ave
5. Broadway & Sweetser Circle - Everett
6. Broadway - Chelsea
7. Washington Street - Roslindale
8. Washington Street - Somerville
9. North Washington Street - Boston
10. Mass Ave - Boston
11. Nubian to Ruggles via Malcolm X Blvd
12. Summer Street
13. Brighton Ave - Allston
14. Mass Ave - Arlington
15. Broadway - Somerville
16. Tobin Bridge
17. Mt Auburn Area Cambridge
18. Warren Street

Service is part of the larger vision to transform the bus network



Bus Network Redesign in the context of Bus Transformation

- Bus Network Redesign is developing the structure of a new bus network.
- The MBTA and its partners are implementing bus priority for that network.
- We are developing a definition of what a High Priority Corridor could mean for the passenger experience, including priority, stop spacing, amenities, and passenger information.
- We are coordinating ongoing efforts on fleet and facilities, bus priority, fare collection, passenger information, shelters, and more. We are also coordinating with the Silver Line Extension study (from Chelsea to Everett), which launched in August 2020.
- We are using internal capacity to develop metrics that address all aspects of the passenger experience.
- We are laying the groundwork for a Bus Transformation office.
- We are defining projects that help us implement pieces of this vision as resources are available.



Progress of Bus Transformation

Bus Procurement

- Average fleet age decreased from 9.5 years to 6.5 years
- Funded procurement underway to allow for retirement of last non-hybrid diesel buses in fleet
- Initial 5 BEB pilot to be expanded to 35 BEB procurement for North Cambridge

We are continuing to coordinate among initiatives to identify opportunities to maximize operating and capital investments

Bus Facilities

- Design work underway on first two bus facility modernization projects
- Quincy and North Cambridge projects will increase capacity by 36%
- Quincy and North Cambridge will increase BEB charging capacity from 5 buses to 160

Bus Transit Priority

- 3% of weekday passenger mileage is in a bus lane, but reliability benefits extend to 41% of weekday passenger miles system-wide
- Approximately 6.1 lane miles implemented from 2002 through 2018; Approximately 2.9 lane miles implemented in 2019; Approximately 10.7 lane miles implemented in 2020
- Planning underway to implement more miles in 2021

Bus Network Redesign

- Designed network-level metrics that will inform evaluation of service changes & Redesign
- Completed analysis of travel demand data through new location-based services dataset
- Identified High Priority Corridors



Appendix



MBTA Bus Transformation Program – Goals and Objectives

Why bus? The MBTA will continue to make integrated investments in bus because of the stable demand for service, especially from our transit critical ridership

What is the Vision for Bus? Better, faster, lower-emissions service, that is more aligned with where riders live, work, and travel, using modern vehicles that provide safe, reliable, and comfortable service.

How will we get there?

- Continue to invest in our fleet in a consistent manner that reduces Green-House-Gas (GHG) emissions, and makes maintenance needs more predictable
- Advance facility investments to improve working conditions, be ready for advancements in bus fleet technology, and be good neighbors
- MBTA's Better Bus Project also includes a range of transit priority, customer amenity, and service improvements



What the High Priority Corridors could be

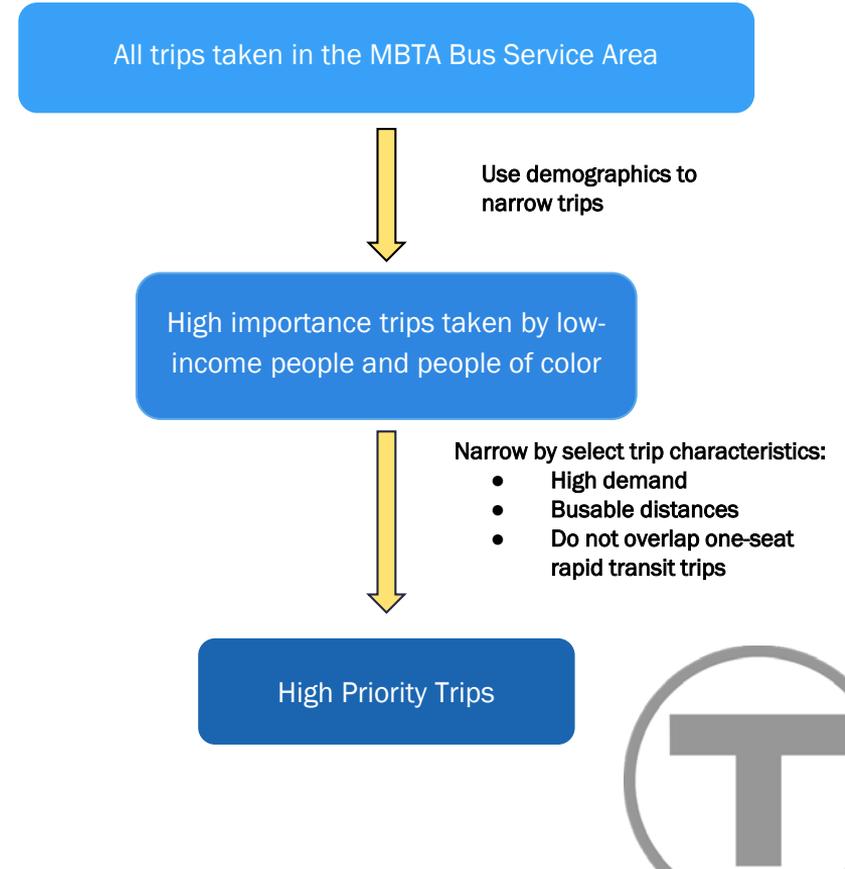
1. The MBTA will have a designated network of frequent bus routes
2. This network will be presented to the public (through route nomenclature, on maps, at stops, etc.) as distinct from the regular local bus network
3. Our long-term aspiration is that this network will have a higher quality experience than the regular bus network
 - a. more thorough passenger information
 - b. higher minimum standard of stop amenities
 - c. optimized stop spacing
 - d. extensive bus priority



We've used travel demand to identify High Priority Corridors

To identify high priority corridors, we narrowed down travel demand using the method on the right.

- **This method centers equity**, by prioritizing travel made by people of color and members of low-income households.
- High Priority Corridors are a work in progress
 - Currently cover O-Ds with high demand for a direct connection and also O-Ds that are well-served with feeder bus routes into the rapid transit network.
 - Still need to conduct outreach with roadway owners to propose best street alignments.
 - Broader public outreach planned for spring 2021



Silver Line Extension Alternatives Analysis

Project Purpose:

- Assess the feasibility, utility, and cost of various alignment and service frequency options of an extension of the Silver Line from Chelsea through Everett to Glendale Square and on to the Orange Line, Lechmere, Kendall Square or North Station.

Project Need:

- Identified in Focus40 as a potential way to lessen crowding on existing bus routes and provide service at near rapid-transit levels for those living just beyond the reach of the Orange and Blue lines.

Stakeholder Process:

- Coordination with municipal partners and other stakeholders through a Stakeholder Working Group with representatives from Chelsea, Cambridge, Boston, Everett, and Somerville

Timeline: August 2020 – early 2022 (18 months)

