



Massachusetts Bay Transportation Authority

Integrated Fleet and Facilities Plan (IFFP)

Part Four: Commuter Rail, Ferry, Paratransit

December 11, 2017



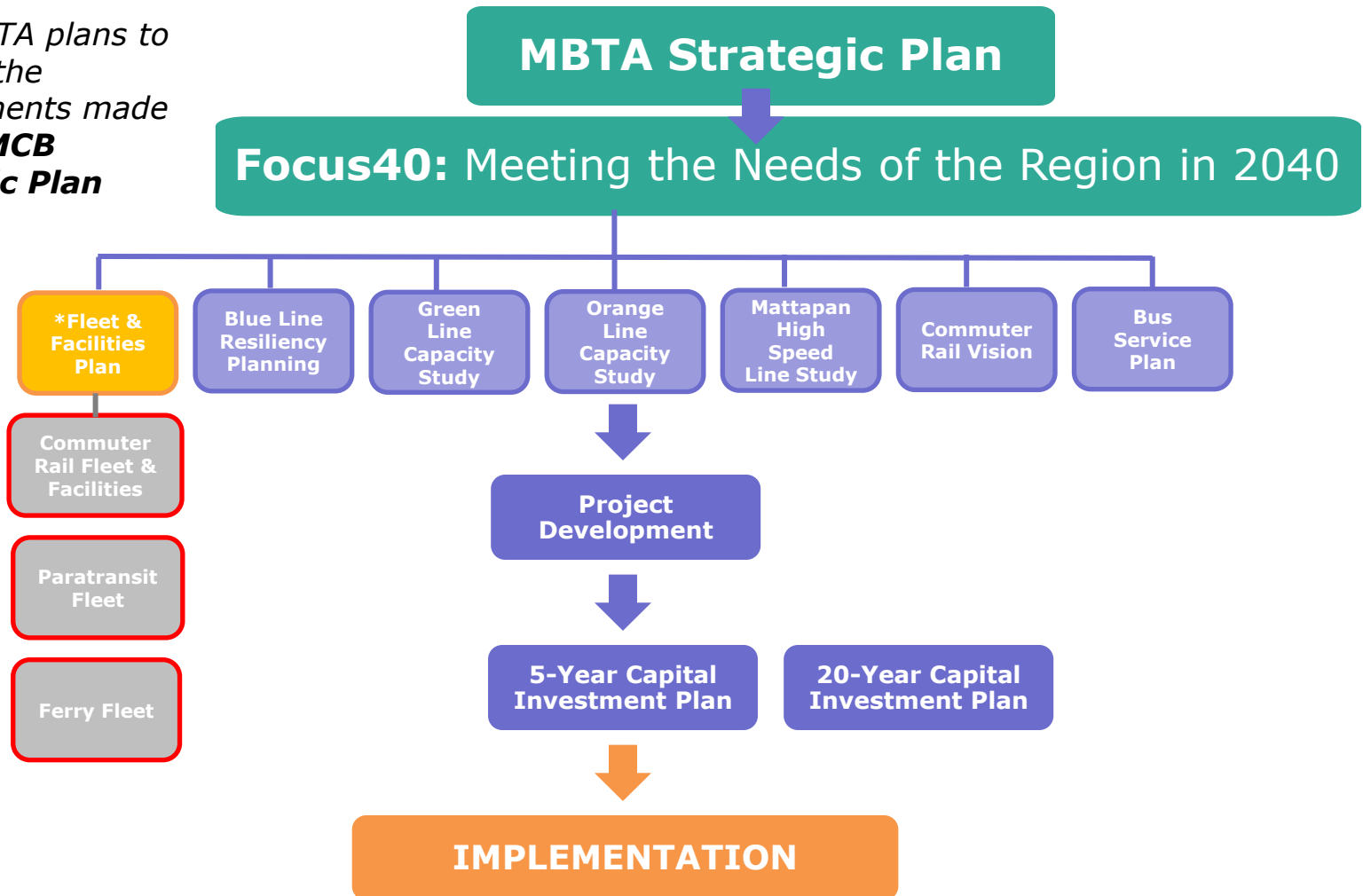
Goals of the Presentation

- General update on the state of the commuter rail, ferry, and paratransit fleets and commuter rail facilities
- Provide MassDOT Board an update on fleet and facilities investment needs
- Generate discussion regarding possible future impacts to these modes



Aligned with MBTA Strategic Vision - Focus40 Planning

*The MBTA plans to execute the commitments made in the **FMCB Strategic Plan**





Integrated Fleet and Facilities Plan Overview

The Integrated Fleet and Facilities Plan is an early step in a larger organizational effort, and is not intended to address all aspects of MBTA operations

The IFFP is:

- Revenue fleets & maintenance facilities
- Currently fiscally unconstrained
- Designed to be implemented over 15 years
- Consistent with MBTA strategic plan
- Being aligned with Focus40 projections for ridership growth
- Focused initially on current MBTA service
- An evolving document, subject to annual updates
- A starting point for strategic fleet maintenance

The IFFP is **not**:

- A plan for stations, non-revenue vehicles, track, signals, and other infrastructure
- Fiscally constrained and therefore is not reconciled with the 5-year CIP
- Solely SGR – it assumes both modernization and capacity investments
- A plan for one-for-one replacement of existing vehicles
- Inclusive of operating costs
- Phased to ensure MBTA has sufficient bandwidth to execute simultaneous fleet procurement



Inventory and Condition Approach

- Fleet and facilities inventory and condition assessment activities performed between January and March 2017
- Consistent with MBTA asset management plan and strategy (MAP-21)
- Physical assessments utilized the FTA 1-5 condition rating scale
- Report cards were prepared summarizing key findings for fleets and facilities

ASSET REPORT CARD - RAIL

Bombardier, BTC-1A	Property		MBTA		Average Rating:		3.0						
	Evaluation Year		2017										
	Delivered		1987 (30yrs)										
	Est. Retirement		2021-2023 (34yrs)										
	Quantity		40										
	Last Overhaul		-										
	Location(s)		BET										
	Avg. LTD Mileage		-										
Asset Type		Fuel Type	Current Collection	Frame		Body	Ownership						
<input type="checkbox"/> Light Rail <input type="checkbox"/> Heavy Rail <input type="checkbox"/> Locomotive <input checked="" type="checkbox"/> Coach <input checked="" type="checkbox"/> Other: Blind Trailer Coach		<input type="checkbox"/> Diesel <input type="checkbox"/> Electric <input type="checkbox"/> Hybrid <input checked="" type="checkbox"/> N/A <input type="checkbox"/> Other:	<input type="checkbox"/> Third Rail <input type="checkbox"/> Overhead <input checked="" type="checkbox"/> N/A	<input checked="" type="checkbox"/> Carbon Steel <input type="checkbox"/> Stainless Steel <input type="checkbox"/> Aluminum <input type="checkbox"/> Other:		<input type="checkbox"/> Carbon Steel <input type="checkbox"/> Stainless Steel <input checked="" type="checkbox"/> Aluminum <input type="checkbox"/> Fiberglass	<input checked="" type="checkbox"/> Owned Outright <input type="checkbox"/> Lease <input type="checkbox"/> Contractor Owned <input type="checkbox"/> Other:						
Current Condition	Brakes	Cab Area	Coupler	Current Collect.	Engine / Propulsion	Ext. Body	Ext. Lights	Doors	HVAC	Pass. Interior	Roof	Trucks	Under Equip.
	3.2	-	3.0	-	-	2.9	3.0	2.9	3.0	2.9	-	3.2	3.3
Reliability	Failures by Subsystem Period: 2016												
	Air System	Brake System	Cooling	Doors	Elec. & Lighting	Engine	Fuel	HVAC	Steering & Susp.	Trans.	Body & Frame	Wheels & Tires	
Summary	-	-	-	-	-	-	-	-	-	-	-	-	
	Total Failures - Total Fleet Mileage 2016 - MMBF -												
Summary	• The fleet suffers from various mechanical and operational reliability issues.												
	Ratings based on FTA SGR Standard												



A blue and white commuter rail train is stopped at a station platform. The train has a large white 'T' logo on its side and the number '2001' on the front. The train is positioned on tracks next to a paved platform with yellow tactile paving. In the background, there are trees, a building, and a silver car. The sky is clear and blue.

Commuter Rail Fleets and Facilities



Commuter Rail Vision Study



MBTA Commuter Rail Vision



- MassDOT/MBTA recently commenced the Commuter Rail Vision Study
- Rail Vision will be complete in 2019 and will be a key input into the procurement of a new operating contract (current contract ends in 2022)
- Rail Vision intended to recommend strategies determined to be implementable that will have implications for service models, vehicle technology, fleet size, and new station investments



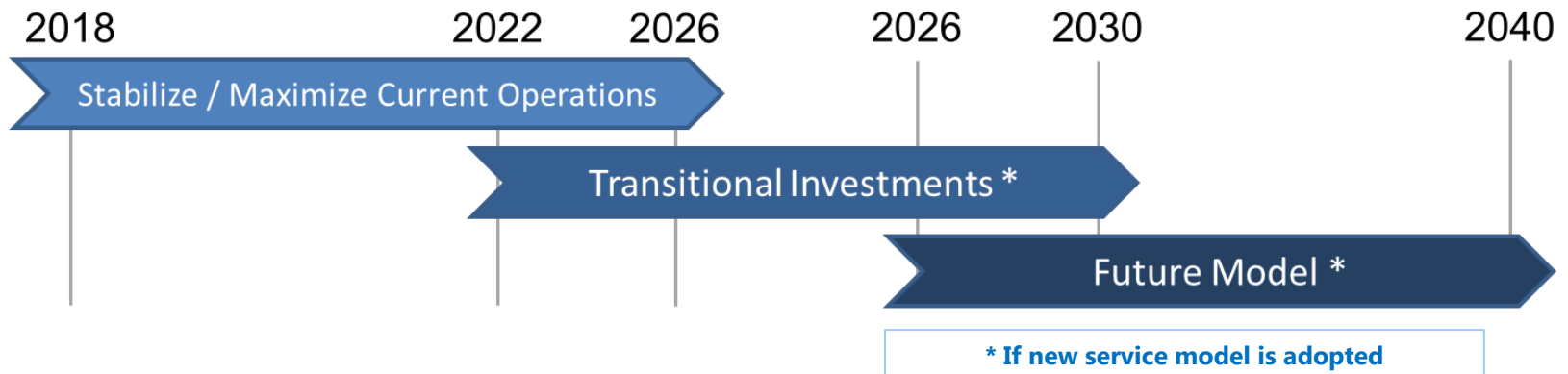
Commuter Rail Vision Study and IFFP |

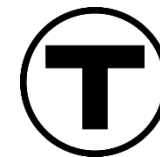


MBTA Commuter Rail Vision



- Strategy accounts for continuity of current service, but with deliberate actions / investments that transition into the new strategic environment.
- As drafted, IFFP near term recommendations targeted toward Stability of Commuter Rail services
- Future editions of the IFFP will incorporate transitional investments and recommend investments that align with finalized strategic vision





Inventory and Condition – Locomotives



<i>Fleet</i>	<i>Age (yrs)</i>	<i>Total Qty</i>	<i>Condition Rating</i>
GMD GP40MC	43	25 ₂	3.0
EMD F40PH-2C	30	25 ₂	2.9
EMD / MK F40PHM-2C	26	12	2.9
EMD (MPI) MP36PH-3C	10	2	3.4
MPI HSP-46	3	40	4.5*
<i>Fleet</i>	21.9	104₁	3.5

*New procurement – assumed score (not physically evaluated)

1- Keolis contractual operating fleet is 90 locomotives

2- Total fleet assumes units currently undergoing SGR programs

- Only locomotives in service were evaluated
- 50% of locomotive fleet is beyond recommended useful life (GP40 & F40)
- MBTA has continued to maintain these assets at significant cost to ensure a SGR

- Significant resources are being dedicated to improving the SGR of the legacy fleet to improve reliability and provide stability of existing service



Ongoing Locomotive Programs

<p>Short Term Recovery \$2M to date</p> <ul style="list-style-type: none"> • Evaluate and repair legacy locomotives • Ongoing; 14 locomotives completed to date • Fleet is 20-25 years old; Goal of short term repairs is to return locomotives to service, not extend useful life 	<p>UTEX Phase I \$6M</p> <ul style="list-style-type: none"> • F40 locomotive rehab program, managed by Keolis • 4 of 5 locomotives complete, with the 5th due in Dec. 2017 • Extends service life 6 years 	<p>UTEX Phase II \$6M</p> <ul style="list-style-type: none"> • F40 locomotive rehab program, managed by Keolis • 5 locomotives complete by June 2018 • Extends service life 6 years
<p>F40 Overhaul \$27M</p> <ul style="list-style-type: none"> • Full overhaul of 10 F40s • Anticipated completion by June 2019 • Extends service life by 20 years 	<p>GP40 Overhaul \$6M</p> <ul style="list-style-type: none"> • Full overhaul of 4 GP40s • Anticipated completion by Dec. 2018 • Extends service life by 20 years; will eventually become work trains 	<p>MP36 Top Deck Overhaul \$2M</p> <ul style="list-style-type: none"> • Top deck overhaul of 2 MP36s • Anticipated completion by Dec. 2018 • Extends service life by 10 years



Commuter Rail Fleet Investment Plan – Locomotives

- Complete ongoing locomotive programs Through 2019
- Align future investment plan of legacy locomotives with Commuter Rail vision strategy 2018-2019
- Pursue leases on small quantity of locomotives 2018-2022
- Overhaul 40 HSP locomotives 2026-2029





Inventory and Condition – Coaches



- Only coaches in-service were evaluated
- MBTA has maintained single level coaches beyond design life.
- MBTA has continued to maintain these units at a significant cost.
- Kawasaki bi-Level coaches currently undergoing overhaul program.

<i>Fleet</i>	<i>Seat Capacity</i>	<i>Age (yrs)</i>	<i>Qty</i>	<i>Condition</i>
Pullman Standard, BTC-1C	114	39	55	3.0
Bombardier, BTC-1A	127	30	39	3.0
Bombardier, BTC-1B	122	30	53	2.9
Bombardier, CTC-1B	122	28	25	3.0
Bombardier, BCTC-1B	122	28	53	3.2
Kawasaki, CTC-4 (Bi-Level)	175	27	24	3.0
Kawasaki, BTC-4 (Bi-Level)	185	27	50	3.7
Kawasaki, BTC-4A (Opt. 1 Bi-Level)	182	20	17	3.0
Kawasaki, BTC-4B (Opt. 2-Bi-Level)	182	16	15	3.1
Kawasaki, BTC-4C (Bi-Level)	178	12	33	3.2
Hyundai - Rotem USA, CTC-5 (Bi-Level) ¹	173	9	28	4.0
Hyundai - Rotem USA, BTC-4D (Bi-Level) ¹	179	9	47	4.0
<i>Fleet</i>		22.92	439*	3.3

1-Hyundai Rotem fleets not physically evaluated

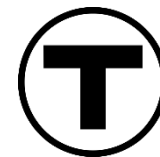
*- Keolis contractual operating fleet is 420 coaches



Commuter Rail Fleet Investment Plan – Coaches

- Complete ongoing Kawasaki coach overhaul Through 2021
- Align future investment plan of legacy coaches with Commuter Rail vision strategy 2018-2019
- Future overhaul of Hyundai-Rotem coaches 2025-2028





Inventory and Condition – Commuter Rail Facilities

<i>Facility</i>	<i>Age</i>	<i>Condition Rating</i>
BET	19	3.1
Readville	30	3.2
South Side S&I	34	3.0
Rochester (leased)	16	NE
<i>Fleet</i>	<i>28</i>	<i>3.1</i>



Commuter Rail Maintenance Facilities

- Current Maintenance facilities are in overall good condition
- Lack of major maintenance facility south of the city
- BET has been identified as vulnerable to climate factors
- MBTA maintains and operates 13 layovers facilities throughout eastern and central Massachusetts



Commuter Rail Facility Considerations

Maintenance Facilities

- Current Commuter Rail maintenance facilities are in fair condition
- Main issues facing maintenance facilities are based on logistics and resiliency
- MBTA is evaluating the opportunity to purchase the Rochester property and invest in the maintenance infrastructure to improve operational efficiencies
- MBTA is investigating opportunities to increase heavy maintenance capacity south of the city & expand back shop support north of the city
- Commuter Rail vision strategy will fully define the future fleet facility requirements



Commuter Rail Layover Facility Considerations

Layover Facilities

- Layover facilities range greatly in capability
- Many facilities are in marginal to poor condition with limits to capability and functionality (e.g.: power, water, air, etc.)
- MBTA should establish a long-term plan for updating and renovating the layover facilities over a period of 15 years with the goal of bringing all facilities into SGR
- Layover facility investment could be funded with a fixed annual budget to allow for appropriate upgrades to be performed each year. This would allow for maximum flexibility to address the greatest needs of layover facilities.



IFFP Commuter Rail Investment Impact

Ongoing Locomotive Programs

\$51M (ongoing)

- Increase fleet reliability
- Improve service
- Improve customer experience
- Reduce maintenance costs

Locomotive leases, HSP Overhaul and Coach Overhaul Programs

\$273M (partially programmed)

- Improve headways
- Increase fleet reliability
- Reduced lifecycle costs
- Improve customer experience
- Reduced emissions

Layover Facility Modernization

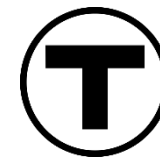
\$75M (not programmed)

- Improve facility capability to better support revenue fleet
- Maintain SGR for layover facilities
- Reduce overnight idling

- Alignment with Commuter Rail Strategic Vision
- Not full IFFP 15 year plan
- Establish stability of Commuter Rail service
- Implementation of some transitional investments



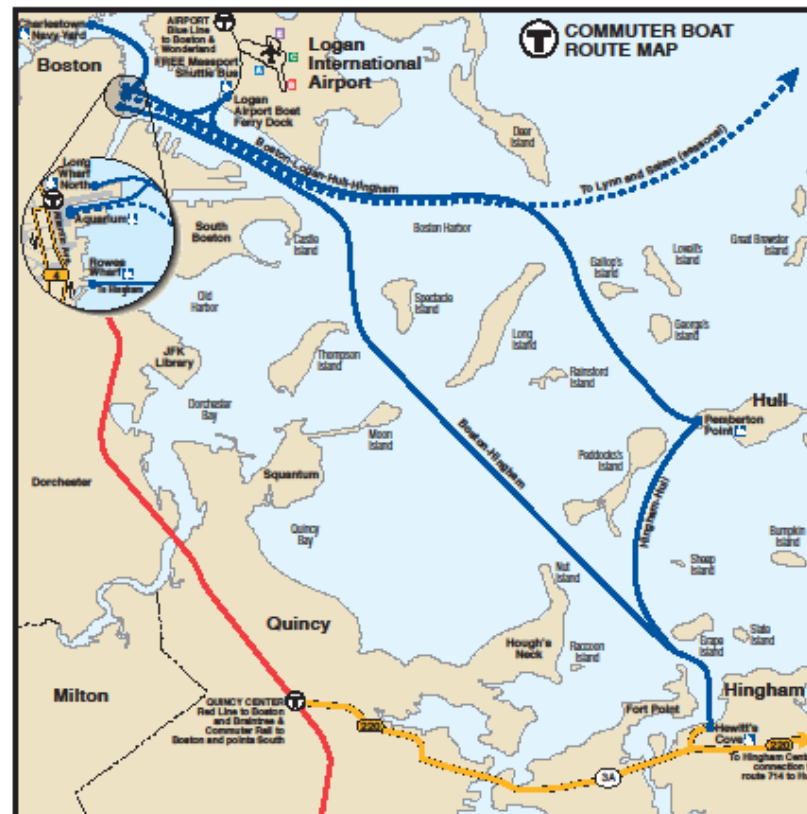
Ferry



Ferry Service Overview

Ridership	5,200 (weekday)
Routes	3
Fleet	4* MBTA 9 Boston Harbor Cruises
Facilities	Contractor-owned

*Includes "Glory" – expected February 2018





Ferry Condition

MBTA conducted 3rd party USCG required marine surveys on “Flying Cloud” & “Lightning”

Per the vessel surveys,

- Hulls have approximately 25 years of remaining life
- All other major systems of the vessel would require complete overhaul or replacement to ensure operations over the remaining life of the hull

Both Vessels repowered in 2016

MBTA will begin development of a complete overhaul specification in 2018



Draft

Source: MBTA Back on Track Data



Ferry Investment Plan

- Delivery of “Champion” Completed 2017
- Delivery of “Glory” February 2018
- Overhaul of “Flying Cloud” and “Lighting” 2018-2021
- Overhaul of “Champion” and “Glory” 2028-2032
- Procurement of replacement ferries 2030+



IFFP Ferry Investment Impact and Planning Considerations

New Ferry Procurement (Completed 2017)

- Increase fleet reliability
- Potential increase to capacity
- Reduce maintenance costs
- Improve customer experience
- Allow for overhaul of older ferries

Ferry Overhaul \$8M (not programmed)

- Enable facilities to continue supporting revenue fleet
- Increase fleet reliability
- Maximize asset lifecycle
- Reduce lifecycle maintenance costs

- MBTA currently operates ferry service on three routes in partnership with Boston Harbor Cruises (BHC)
- The water transportation advisory council is currently completing a full water transportation study to better understand the MBTA future role in water transportation service.
- Overhaul investment of the 2 oldest MBTA-owned ferries could provide opportunities to reduce the total number of vessels provided by BHC.

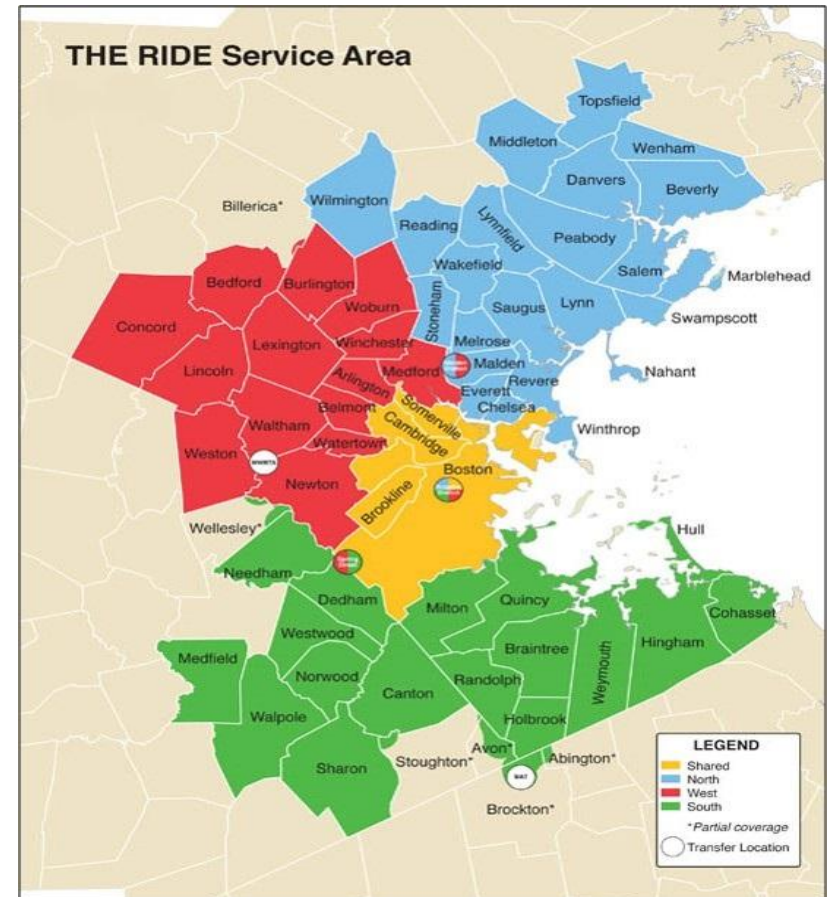
Paratransit





Paratransit Overview

Ridership	Weekday: 6,700 Weekend: 3,200
Service Areas	3 with core area serviced by all contractors
Contractors	3 service providers 1 centralized call and control center provider
Facilities	Contractor-owned





Paratransit Inventory and Condition



MBTA-Owned Fleet			
Type	Fleet	Model Year	Qty
Vans	Ford Econoline	2007	71
	Ford Econoline	2009	104
	Ford Econoline	2013	215
Sedans	Ford Crown Victoria	2009	15
	Ford Crown Victoria	2011	103
	Ford Fusion	2014	139
	Fleet		647

- Paratransit fleets are MBTA owned and supplemented by contractor fleets
- Service is provided by 3 contractors, who are responsible for operating and maintaining fleets



IFFP Paratransit Investment Impact and Planning Considerations

Ongoing Fleet Replacement Program

\$48M (not programmed)

- Improve customer experience
- Increase fleet reliability
- Reduce maintenance costs
- Maximize MBTA asset lifecycles
- Reduce lifecycle maintenance costs for MBTA assets

Expand Use of Non-Dedicated Service Providers

Scope under review

- Improve customer experience
- Stabilize ridership fluctuations
- Maximize MBTA asset lifecycles
- Reduce lifecycle maintenance costs for MBTA assets

- MBTA will establish an ongoing fleet replacement program, resulting in periodic vehicle replacement
- Non-dedicated service providers will be leveraged to absorb fluctuations in ridership, allowing MBTA to right-size its fleet of owned assets
- **Decision point:** Explore alternative procurement methods to improve contract efficiency and reduce cost



Key Takeaways

Commuter Rail

- Complete ongoing locomotive reliability improvement initiatives
- Establish stability of Commuter Rail service
- Implementation of some transitional investments

Ferry

- The water transportation advisory council is currently completing a full water transportation study to better understand the MBTA future role in water transportation service.
- Overhaul investment of the 2 oldest MBTA-owned ferries could provide opportunities to reduce the total number of vessels provided by BHC

Paratransit

- Establish program for replacement for paratransit fleet
- Explore alternative procurement methods to improve contract efficiencies and reduce cost



Upcoming Presentations

- Light Rail (Green Line and Mattapan) – December 18th