Massachusetts Bay Transportation Authority

Transformation of the Mattapan High Speed Line

The Path to Accessible, Reliable, and Modern Transportation

January 2019

The Mattapan Trolley Today

- Service along 2.6 miles of track in Milton and Dorchester from Ashmont Station to Mattapan Station (8 stations total)
- Connects to the Red Line, many local bus routes, and the Neponset Trail
- Served by a fleet of ten 1940s PCC trolleys; 4 trolleys for daily service requirements, 2 revenue spare, and 4 out of service
- In operation 7 days a week (suspended during major snow events)
- Approximately 6 minute trip one-way
- Approximately 6 minute headways during peak hours
- 6,600 average daily weekday boardings (3,200 inbound and 3,400 outbound)

Mattapan Transformation First Principles

1. Prioritize safety
2. Meet standards for accessibility
3. Improve the level of service
4. Minimize service interruptions during implementation of the Mattapan transformation
5. Incorporate community and stakeholder input
6. Invest to continue operation of the existing Mattapan PCC trolleys for another 8-10 years

Three Phases of the Mattapan Transformation Program

Phase 1 – Immediate Investments and Future Planning
Maintenance of vehicles to support continued existing service for 8-10 years, assessment of existing investment and service needs, study and evaluation of future service options, and initial community engagement

Phase 2 – State of Good Repair and Modernization
Infrastructure investments to support future service independent of vehicle type

Phase 3 – Integration of Future Vehicle Fleet
Additional investments required to integrate the future vehicle fleet, such as vehicle upgrades or acquisition, station platform customization, vehicle-specific power upgrades, and maintenance facility construction

Mattapan Transformation Program

Phase 1 – Immediate Investments and Future Planning

Phase 2 – State of Good Repair and Modernization

Phase 3 – Integration of Future Vehicle Fleet

Phase 1 – Immediate Investments and Future Planning

PCC Car Fleet Upgrade Program

March 2018 – Present
MBTA and Brookville Equipment Corporation (BEC)

- Investment of $7.9 million for upgraded propulsion, trucks, and air system equipment (from BEC) on 8 PCC cars to address major reliability issues
- Eight (8) cars are undergoing repairs by MBTA to car body structure, roof corrosion (pictured), and other selective systems
- Program schedule delayed by lead paint abatement - first car estimated to return to service in August 2019 with program completion in 2020

Phase 1 – Immediate Investments and Future Planning

Existing Conditions Study and Future Options Evaluation

- Reviewed existing conditions of the Mattapan High Speed Line (MHSL) and determined near-term investment needs to reach SGR for continued PCC service for the next 8-10 years
- Reviewed potential future vehicle options and evaluated associated infrastructure (stations and access, bridges, power systems, railway/roadway, drainage, maintenance facilities), operating, community, and cost impacts

Phase 1 – Immediate Investments and Future Planning

Community Engagement – Public Meetings

Mattapan Public Library	4/03/2017
Milton High School	4/13/2017
Lower Mills Public Library	4/24/2017

Feedback Received

- Accessibility is a major issue (takes precedence over historic charm)
- Community is growing, trolley attracts residents
- Neponset River Trail is an asset and must be kept safe, peaceful, and environmentally friendly
- No buses

Mattapan Transformation Program

Phase 1 – Assessment of Immediate Needs and Future Planning

Phase 2 – State of Good Repair and Modernization

Phase 3 – Integration of Future Vehicle Fleet

Phase 2 – State of Good Repair and Modernization

Infrastructure

- Bridge rehabilitation
- Rail and track maintenance
- Power system resiliency efforts, such as the upgrade of power infrastructure, including renovation of Ashmont traction power substation and construction of new substation likely at Mattapan
- Signal system installation at the two at-grade road crossings to meet current safety standards

Phase 2 – State of Good Repair and Modernization

Stations

- Modular improvements to station accessibility and amenities independent of vehicle type
- Upgrades to address severe deterioration at all 8 stations
- Improved access and paths of travel at Valley Road, Milton, and Ashmont

Mattapan Transformation Program

Phase 1 – Assessment of Immediate Needs and Future Planning

Phase 2 – State of Good Repair and Modernization

Phase 3 – Integration of Future Vehicle Fleet

Future Vehicle Fleet Options

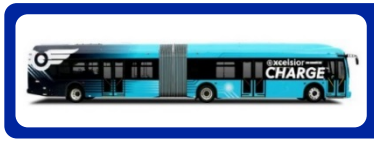
Option 1: Continue Heavy Repair and Upgrade of MBTA's Existing PCC Fleet

Option 2: Procure New, Replica PCC Vehicles

Option 3: Repurpose Existing MBTA Green Line Type 9 Light Rail Vehicles (LRVs)

Option 4: Procure New, Modern LRVs

Option 5: Procure New 60-foot Diesel-Electric Hybrid Bus Fleet



Option 6: Procure New 60-foot Battery-Electric Bus Fleet

Option 1: Continue Heavy Repair, Upgrade of MBTA's Existing PCC Fleet

Benefits

- Historic

Existing MBTA PCC trolley

Concerns

- Major accessibility issues (high step/floor, no vehicle ramp or lift, no automated stop announcements)
- Costly maintenance, parts obsolescence, and poor reliability
- Inoperable during snow events
- Vehicles far beyond expected useful life with deteriorating car body structures
- Cannot incorporate modern safety systems
- At capacity, no room for growth

Option 2: Procure New, Replica PCC Vehicles

Benefits

- Could build on new PCC propulsion equipment
- Retains public preferred historic look and feel, but with modernized systems

Example of replica heritage trolley

Concerns

- Accessibility marginally accomplished through on-vehicle lift
- Not a service proven vehicle, limited number of qualified vendors
- Not an actual historic vehicle

Option 3: Repurpose Existing MBTA Type 9 LRVs

Benefits

- Highly accessible (70% low floor, level/faster boarding)
- Low expected vehicle capital cost
- Vehicles will have been accepted and integrated into MBTA operations
- MBTA-specific design likely to fit MHSL clearance envelope
- Increased/improved passenger area; room for ridership and fleet growth
- Less than half the fleet needed for Mattapan; remainder could be sold, continue in use on GL, or remain as spares
- Built by established manufacturer

Concerns

- Dependent on Type 10 procurement plan and schedule
- Heavier axle loading than PCC has more track wear and maintenance

MBTA Type 9 in testing

Option 4: Procure New, Modern LRVs

Benefits

- Highly accessible (up to 100% low floor)
- Modern propulsion (e.g. battery-powered, off-wire technology)

Example modern LRV

Concerns

- Completely custom vehicle (operational performance, reliability, and maintainability unknown)
- Small fleet size may make an order less attractive to the larger rail manufacturers
- Highest vehicle cost of Mattapan future options

Option 5: Procure New 60-foot Diesel-Electric Hybrid Bus Fleet

Benefits

- Partial low floor vehicles, level boarding
- Increased operational flexibility (breakdowns, fleet interchangeability)
- Improved snow operation with center-powered axles
- Easier accommodation of growth
- Could allow for through flow at terminals, providing one-seat rides beyond the existing corridor (access required at Mattapan for travel to offsite heavy maintenance bus facility)

Concerns

- Significant lack of public support
- Ramp, kneeling, and securement system results in slower accessible boarding than modern LRV
- Longest expected corridor shutdown for construction
- Overall capacity less than PCC

Option 6: Procure New 60-foot Battery-Electric Bus Fleet

Benefits

- Same as Option 5 (diesel-electric hybrid bus)

Example 60-foot battery-electric bus

Concerns

- Same as Option 5
- All-electric buses and charging infrastructure new to MBTA fleet
- Electric buses are new to industry overall (limited service proven record)

Evaluation of Vehicle Options By Estimated Capital Cost

	1. MBTA PCC	2. Replica PCC	3. MBTA Type 9	4. New LRV	5. Hybrid Bus	6. Battery Bus
Phase 1	$8 m	$0	$0	$0	$0	$0
Phase 2			$90-115 m (all options)			
Phase 3 Vehicle	$5 m*	$40 m	$0	$65 m	$20 m	$20 m
Phase 3 Infrastr.	$70 m	$70 m	$75 m	$80 m	$100 m	$95 m
Phase 3 Total	$75 m	$110 m	$75 m	$145 m	$120 m	$115 m
TOTAL	$190 m	$220 m	$190 m	$260 m	$215 m	$215 m

* Vehicle remains non-accessible

Evaluation of Vehicle Options Against First Principles

	1. MBTA PCC	2. Replica PCC	3. MBTA Type 9	4. New LRV	5. Hybrid Bus	6. Battery Bus
Prioritize safety	–	✓	✓	✓	✓	✓
Meet accessibility standards	✗	✗	✓	✓	✓	✓
Improve level of service	✗	✗	✓	✓	✓	✓
Minimize service interruption	✓	✓	✓	✓	✗	✗
Incorporate community input	✓	✓	✓	✓	✗	✗

Evaluation of Vehicle Options

	1: MBTA PCC	2: Replica PCC	3: MBTA Type 9	4: New LRV	5: Hybrid Bus	6: Battery Bus
Vehicle Suitability	◑	◔	●	◕	◕	◑
Compatibility with Existing Infrastructure	◕	◕	◑	◑	◑	◑
Potential for Infrastructure Simplification	○	○	◑	◑	◑	◔
Potential for Service Connection or Expansion	◔	◔	◑	◔	●	●
Facility Requirements	◔	◔	◔	◔	◕	◕
Future Operational Sustainability	○	◑	●	●	◕	◕
Summary	◔	◔	●	◑	◕	◑

Legend:
- ● = Most Favorable
- ○ = Least Favorable

Transformation Program Key Actions and Durations

Phase 1 – Immediate Investments and Future Planning

- Existing conditions and future options evaluation study in final stage of community engagement – to be completed early 2019
- PCC car fleet upgrade program began March 2018 to support operation for next 8-10 years – 1st car will return to service Aug 2019, 8th car end of 2020

Phase 2 – State of Good Repair and Modernization

- Design and construction services procurement and project execution estimated duration of 3.5-5 years (additional 2-2.5 years for NEPA study if federal funds are used)

Phase 3 – Integration of Future Vehicle Fleet

- Mode/vehicle choice will influence overall program timeline – rail vehicle procurement approx. 5-6 year duration, bus procurement 2 years
- Similar timeline as Phase 2 for design and construction of remaining infrastructure improvements plus approx. 0.5 years for testing/commissioning

Next Steps

- **Request funding for Phase 2 in next CIP cycle**
- **Public Meetings to be Scheduled in Early 2019**
  - Mattapan Public Library
  - Milton High School
  - Lower Mills Public Library
- **Rider and Local Business Survey**

Responses from riders, local businesses, and online participants will be collected to help MBTA better understand the current and future transportation needs of the community related to the Mattapan Trolley.