Massachusetts Bay Transportation Authority

Bus Facilities Modernization Program

Policy and Strategic Approach

March 4, 2019

This Presentation

1. This is the first in a series of presentations on the modernization of our bus maintenance facilities.
2. Discuss the policy decisions and strategic approach
   - Fleet technology and the associated needs for our facilities
   - Facility capacity to meet current needs, interim logistical needs, and future needs
   - Design criteria to be incorporated to meet the capacity, technology, and operational needs of the future bus fleet and facilities
3. The second presentation will occur on March 25, 2019 and will discuss:
   - Work to improve the facilities in the short term
   - Discuss existing facility network
   - Discuss intended future state facility network
   - Modernization sequence

Board Considerations that will be discussed today:

The infrastructure and facility requirements to support advanced propulsion vehicles.

The appropriate target fleet size to scale the facility network.

Overview

1. The MBTA has a deferred investment need to address the condition and capacity of the bus maintenance facility network
2. We have a need to act with urgency to:
   - Meet the functional need of our bus network
   - Address the working conditions within our garage infrastructure
   - Expand our infrastructure to facilitate network-wide modernization
3. We need to prepare our infrastructure for future fleet electrification and other modern technologies
4. Each facility needs investment
5. Near term action is necessary while the long term strategy is developed

This work will occur concurrently and include the committed $25M annual investment in our bus maintenance facilities

MBTA Bus Facilities Modernization Program

- **MBTA's Bus Garage Infrastructure consists of 10 Maintenance Garages, including Everett Heavy Maintenance**
- **MBTA Garages have a bus capacity ranging from 28 to 254**
- **Current Facilities Status**
  - At or beyond capacity
  - Average age 54 years
  - Some functionally obsolete (e.g. capacity, ceiling heights, door heights)
- **Action: Develop an executable bus facility modernization/replacement program**
  - Locations/Permitting
  - Emerging Propulsion Technologies
  - Battery Charging
  - Utility Requirements
  - Bus Storage
  - Maintenance Improvements

All garages are near or above capacity, and are beyond their useful life or are functionally obsolete.

Intent is to re-use all facility sites that can support the future plan

Bus Facility Considerations for a Battery Electric Bus Fleet

- Battery Electric Bus technology is rapidly evolving
- Battery technology currently requires environmental temperature controls to maintain suitable equipment life – indoor, temperature controlled bus storage is the contemplated solution
- Power needs are significant
  - Larger local power substations will be necessary to re-charge the fleet
  - It is anticipated that off-peak charging will occur

Should new facilities be designed to accommodate new advanced technology / electric buses?

Future Bus Facility Capacity

The optimal fleet size is difficult to predict at this time:

- Ongoing transportation initiatives; Better Bus Project and Network Redesign are not yet completed.
- Growth in municipal partnerships w/ dedicated bus lanes, queue jumps, and signal priority will influence fleet needs.
- Replacement of diesel buses with battery electric buses is not currently a 1 for 1. Additional replacement vehicles are necessary due to:
  - Travel range
  - Refuel/Recharge time
  - Energy consumption due to HVAC

The intent is to maximize facility capacity and flexibility for fleet type at each site until the work is complete to develop the target size of the MBTA bus fleet.

Are there other fleet size considerations that should be incorporated?

Bus Facility Policy and Principles

- Prioritize safety and health
- Increase fleet reliability and resiliency
- Minimize operating and maintenance costs of the bus system
  - Minimize the use of small and specialty garages
  - Minimize Deadhead miles
- Build overall capacity and capability to exceed existing, and meet future demand and technology
- Bring facilities to a state of good repair in **13 years** while:
  - Enabling facilities to continue supporting revenue fleet
  - Ensuring facilities accommodate a modernized fleet
    - Each facility will be designed to accommodate **future electrification** of bus fleet
    - Each facility will maximize **indoor fleet storage**
- Minimize impact on current bus system operations
- Coordinate across MassDOT, MBTA, and Municipal initiatives

FOCUS 40 The 2040 Investment Plan for the MBTA

Better Bus Project Making transit better together

Bus Network Redesign

Are there other policies or principles to be incorporated?

Bus Facility Strategy and Considerations

Strategy: Develop a sequence of investments to address the need

1. Prioritize garage construction to meet the needs of the fleet and workforce
2. Build additional capacity throughout the Modernization Program
   - To provide capacity to carry out the Modernization program
   - To create the capacity for future growth
   - Build appropriate regionalization of facilities
3. Eliminate Overhead Catenary Infrastructure
4. Address past commitments

Strategic Considerations:

- Workforce
- Service planning (growth areas, route profiles, and dead head miles)
- Community Interests
- Real Estate/Land Acquisitions
- Environmental Stewardship and climate resiliency
- Optimal facility capacity and size
- Ownership of new and existing facilities
- Phasing, Timing and location of improvements
- Utility service infrastructure availability, condition, and capacity

Any other considerations that should be evaluated?

Facility Design Criteria

Fueling and Washing Bays

- 2 fueling stations per 100 buses
- Indoor wash bays to allow winter use
- Electric: Electrical equipment for Battery Electric Bus charging - 5,000 sf per 100 buses

Maintenance Bays

- 1 bay per 12 buses min

Bus Queuing and Storage

- Electric: Indoor storage
- Maximize indoor circulation to limit neighborhood disruptions
- Sufficient on-site queuing space to minimize traffic impacts

Employee Facilities

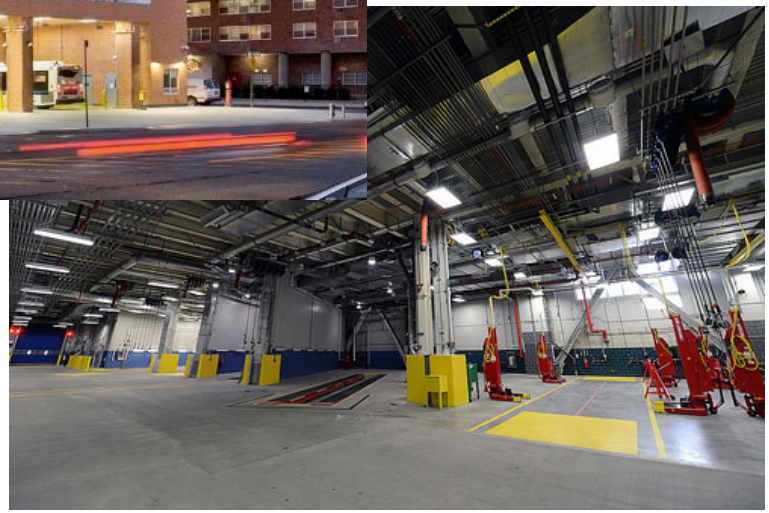
- Parking spaces - 1 per employee
- Office space and employee amenities

Equipment and Parts Storage

City of Saskatoon Civic Operations Centre

NY MTA Mother Clara Hale bus maintenance facility

Facility Design Criteria



Multi-story bus garage with indoor maintenance and fleet storage, material management, and administration space

Bus Facilities in Most Urgent Need of Replacement/Modernization

Albany Garage and Quincy Garage are the first investments planned:

- Inefficient work space configuration and layout
- Critical height limitations
- Facility condition
- Facility capacity

Strategic details will be presented in future Board discussions

Next Steps

- **March 25, 2019 Presentation – Facility Modernization Program Part 2 :**
  - Update on ongoing and near term investments on currently operating facilities
  - Existing bus network configuration and capacity
  - Framework for future improvements
  - Identify target facility capacity and size
  - Develop sequencing order and implementation

- **Present program timeline for near term actions:**
  - Addressing the functional and conditional obsolescence of the Quincy and Albany Garages
  - Addressing the need to expand bus maintenance capacity and capability in concert with near term bus procurements and anticipated first wave bus electrification

- **Management Approach:**
  - Office of Chief Engineer will lead and coordinate the overall program and components
  - Engage a program manager
  - Engage Real Estate staff for land needs
  - Engage Capital Delivery to execute design and construction activities
  - Align bus procurements with facility schedules