Red/Orange Line Transformation Program Update

Fiscal and Management Control Board
June 22, 2020
Maysoon Tawfik
Agenda

• Red/Orange Line Transformation Program Update Overview
• Transformation Task Force
• Schedule
• Future Capital Investment Needs
• Road Map
• Asset Management
• Track & Power Renewal Program
• Customer Facilities Assessment Process
• Operating and Maintenance Budget
• Next Steps
Red/Orange Line Transformation Program

Program driven by customer benefits and service outcomes

- **Asset Management**: Fundamental adoption of asset management regimes to deliver exceptional safety and service reliability
- **Performance-based outcomes**: Philosophical shift from historical management objectives to performance-based outcomes management
- **Fiscal Accountability**: Managed to ensure exemplary stewardship of taxpayer dollars
- **Leadership**: Delivered by unified team under singular leadership integrating all disciplines with clear roles, responsibilities and accountabilities
- **Organizational Commitment**: Complete organization commitment to achieving service outcomes

Customer Benefits & Service Outcomes

Delivered by unified team under singular leadership integrating all disciplines with clear roles, responsibilities and accountabilities
Customer Benefits and Service Outcomes

<table>
<thead>
<tr>
<th>Red Line</th>
<th>Orange Line</th>
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<tbody>
<tr>
<td>3 Minute Headways</td>
<td>4 ½ Minute Headways</td>
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<tr>
<td>95% Reliability</td>
<td>96% Reliability</td>
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<tr>
<td>50% Capacity Increase</td>
<td>33% Capacity Increase</td>
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Red/Orange Line Transformation Program Update

Initial plan presented to Board on December 16, 2019

- Strategy to achieve Headway by 2023 and Reliability by **2025**
- Unconstrained by funding
- Unconstrained by project delivery capacity
- Unconstrained by MBTA organizational capacity

Collaborative, integrated approach for customer benefits

- MBTA program governance
- Current and projected schedules for ALL activities under development
- Identification of potential risks
- Prepare “realistic” vs. “unconstrained” funding and project delivery assumptions
Red/Orange Line Transformation Program Update

• Finalize comprehensive, critical path schedule of major milestones by December 2020

• **Key activities added to strategy since December 2019:**
  • Risk Assessment
  • Asset Management
  • Track and power renewal approach
  • Passenger facilities assessment process
  • Operating budget assessment process

• Current projects and funding are supplemented with additional projects and funding needs
Integrated Red/Orange Line Transformation Organization
Integrated Multi-Discipline Performance-Based Governance & Systems Engineering

**Task Force**
- Maysoon Tawfik - CHIEF
  - Systems engineering approach
  - Integrated program management
  - Coordinated decision-making
  - Organization accountability
  - Monthly status report

**Steering Committee**
- Jeffrey Gonneville – CHAIR
- James Neider – VICE-CHAIR
  - Provide support (resources & key decisions)
  - Governance
  - Safety-lead approach
  - Stakeholder management
  - Annual status report

**General Manager**
- Steve Poftak
  - Strategic oversight
  - Stakeholder management

**Fiscal & Management Control Board**
- Governance
- Resources

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- Vehicle Engineering
- OCE
- Engineering & Maintenance
- Vehicle Maintenance
- Transit Operations
- Safety
- Capital Programs/Delivery
- Systemwide Accessibility
- Customer Experience
- OPMI
- ODCR
- Legal
- Revenue
- IT
- Finance & Administration
- Procurement
- Human Resources
- Real Estate

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Monthly status update

Bi-Annual major status update

**Safety Review Panel**
- Safety Team - CHAIR
Red/Orange Line Transformation Schedule Approach

- Fully integrated, critical path schedule under development
- Essential tool for managing RLOL transformation program
- Headway and reliability milestones linked to infrastructure, asset management and operations
- Critical activities will identify both funded and unfunded initiatives
Key Schedule Assumptions and Risks

- Impact from COVID-19 still being assessed for all aspects of program
- Additional infrastructure funding commitment schedule
- Program governance, activities and responsibilities by MBTA
- Operating and maintenance budget implications must be developed and addressed
- Vehicle delivery, commissioning, and reliable performance schedule
- Vehicle decommissioning synchronized with vehicle delivery and yard and maintenance facility projects

- Procurement duration for services and construction can be met
- Track/power renewals
  - Right of way access
  - Industry capacity
  - MBTA force account availability
  - Substitute service program
- No additional power, signal, infrastructure gaps are determined during modeling
- Sufficient capital & operations staffing with appropriate skills & training
- Employee engagement to support outcomes
Red/Orange Line Stations Funding Current and Unfunded (Since 2015)

- Key customer facilities projects advanced as part of overall MBTA Customer Experience program funding
- $701 million invested in addition to RLOL Infrastructure funding
- Projects delivered
  - Park St Station Improvements
  - Wollaston Station
  - Assembly Station
  - Ruggles Station platforms
  - South Shore garages
  - DTX elevators
- Process evaluation of stations, garages, customer information systems (study funded; requirements unfunded)
- Process evaluation to be completed by 2021
Red/Orange Line Transformation Program

Red/Orange Line Capital Investment Current and Unfunded (Since 2015)

### Red Line
- **Transformation Program** (Yards, Maintenance Facilities, Test Tracks, Signals): $1,127M
- **Customer Facilities** (Stations, Garages, Wayfinding, Elevators, and Escalators): $701M
- **Vehicles**: $1,010M

Subtotal $2,838M

### Orange Line
- **Systemwide Track & Power Renewals**: $1,267M

Subtotal $4,104M

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*Estimated amount

- **Future Track & Power Renewals**: $1,845M
- **Future Annual Track & Power Capital Renewals**: $44M

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Current CIP

Additional Funding thru 2028

Additional funding Beyond 2028
Train service punctuality will be achieved through:

- Infrastructure RAM
  - Asset management
  - Stations Assessment Process
- Track & Power
  - Track & Power Renewals
- Operations
  - Operating & Maintenance Budget
- Rolling Stock
- Timetabling
- Train Control
- Maintenance

**Mapping Integrated Network Performance across Network Elements**

Performance measure of integrated capability

Assess (train timetables, reliability, availability and integrated logistics). Verify during design phase by use of agreed system model.

**RAM:** Reliability, Availability, Maintenance
Asset Management Strategy

Increasing System Safety Assurance and Asset Reliability

- Reactive
  - Safety critical
  - Controlled reactive
  - Limited data
- Safety critical & perf insp
  - Controlled reactive
- Data driven assurance
- Automated train-bourne insp
  - Introduced
  - Data driven repair
  - Increased preventative work
- Train-bourne insp
  - Preventative maintenance
  - Risk based maintenance
- Predict & prevent (RCM)
  - Data driven preventative mtce

At risk  Reactive  Preventative  Health monitoring (for reliability)  Robust

Find and Fix
- Reactive
  - Responds to failures
  - Disrupts train operation

Predict and Prevent
- Proactive
  - Responds to assets health indicator
  - Maintains train operation
Red Line Track & Power Renewal Program

**Full-Depth Track Renewal**

Programmed: 62,000 ft of track  
Additional*: 10,000 ft of track  
Total: 72,000 ft of track

**Power System Renewals**

DC Power cables, Traction Power Substations (TPS), Unit Substations, Standby Generators.

*Additional track renewals are estimated based on work performed outside the defined track renewal program  
**Power System renewals, including work outside the defined track renewals, have been allocated to the defined track renewal program to facilitate planning.
Orange Line Track & Power Renewal Program

**Full-Depth Track Renewal**
- Programmed: 58,000 ft of track
- Additional*: 10,000 ft of track
- Total: 68,000 ft of track

**Power System Renewals**
- DC Power cables, Traction Power Substations (TPS), Unit Substations, Standby Generators.

*Additional track renewals are estimated based on work performed outside the defined track renewal program.**Power System renewals, including work outside the defined track renewals, have been allocated to the defined track renewal program to facilitate planning.
Stations Assessment Process

Define Transformation Outcomes
- Safety
- Reliability
- Headways
- Customer experience

Modeling
- Safety
- Passenger forecasts
- Operating practices
- System capacity
- Reliability
- Power

Assess & prioritize modeling and asset renewal requirements in CIP
- Scope
- Estimate
- Timescale (priority)

Facilities Asset Management Strategy
+ Station asset data in Asset Management System

Station Transformation Outputs
- Rail Safety (e.g., Platform edge doors to manage capacity)
- Building Safety (asset modernization)
- Customer technology improvement programs (live, interactive data)
- Dwell time management solutions (e.g., Train regulation)
- Passenger flow improvements (e.g., gatelines, access & egress)
- Station remodeling / rebuild
- Improved station accessibility (e.g., elevators, escalators)

Achieve Transformation Outcomes
- Safety
- Reliability
- Headways
- Customer experience
Operating and Maintenance Budget

Key Inputs:
- 24-hour operations model
- Staff succession
- Transportation and maintenance skills & staffing assessment
- Asset management
- Technology
- Other needs

Evaluation of Operating Budget Gaps:
- Operations
- Maintenance
- Asset Management
- Systems & Technology Support

Key Outputs:
- Total & annual operating budget needs through 2028, consistent with CIP forecast
- Total & annual staffing requirements, recruitment, and training plans

Evaluation of Operating Budget Gaps:
- Total & annual operating budget needs through 2028, consistent with CIP forecast
- Total & annual staffing requirements, recruitment, and training plans
## Next Steps

### Governance
- Program oversight by executive leadership/steering committee
- Integrated team, actions and responsibilities across MBTA
- Prepare new milestone dates
- Employee engagement
- Stakeholder communications program

### Operations
- Operating practices for headway adherence and dwell times
- Substitute service plan

### Administration
- New CIP resources for Red/Orange Line - $1.3 billion
- Validate the annual operational service and maintenance budget needs
- Recruitment of necessary staff, including succession planning
## Next Steps

### Office of Chief Engineer/E&M
- Asset management and reliability monitoring and maintenance
- Delivery, testing and “burn-in” of new vehicles
- Operations, capacity, load flow and reliability modelling
- Future capacity evaluation (Vehicles, Stations, Signal technology, Power and Infrastructure)
- Development of stations and passenger amenity program
- Coordinate with Fare Transformation Program

### Capital Delivery/RLOL Transformation
- Completion of yard and maintenance facility upgrades
- Complete signal upgrade, testing and commissioning
- Design and construct five track/power projects
- Establish Safety Review Panel within Red/Orange Line Team
- Track/power work strategy
  - Industry capacity
  - MBTA force account plan to ensure support for Orange/Red Line
  - ROW access

### OPMI
- Passenger and Train Reliability Metrics