



**Massachusetts Bay
Transportation Authority**

Red/Orange Line Transformation Program Update

Fiscal and Management Control Board

June 22, 2020

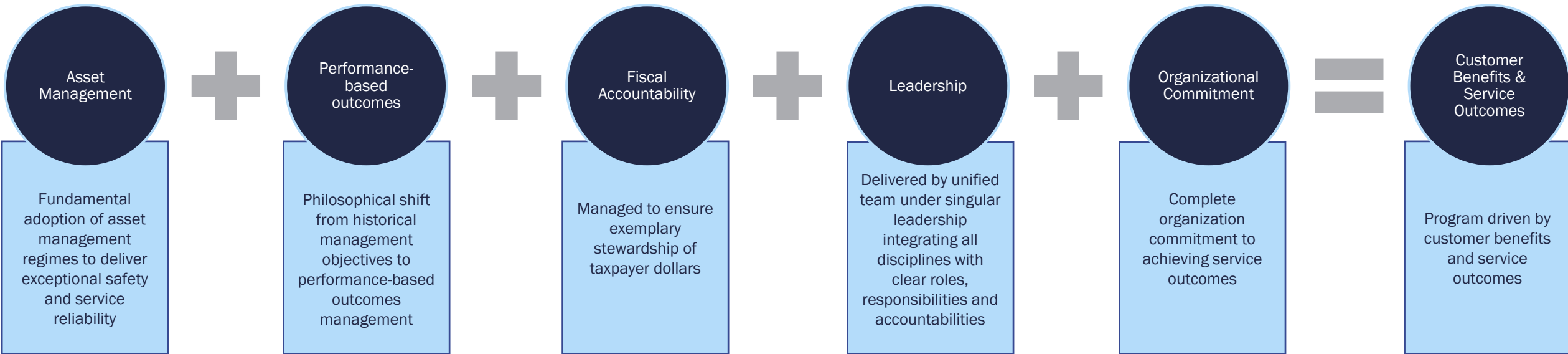
Maysoon Tawfik

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



Customer Benefits and Service Outcomes

Red Line

3 Minute Headways	95% Reliability	50% Capacity Increase
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Orange Line

4 ½ Minute Headways	96% Reliability	33% Capacity Increase
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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

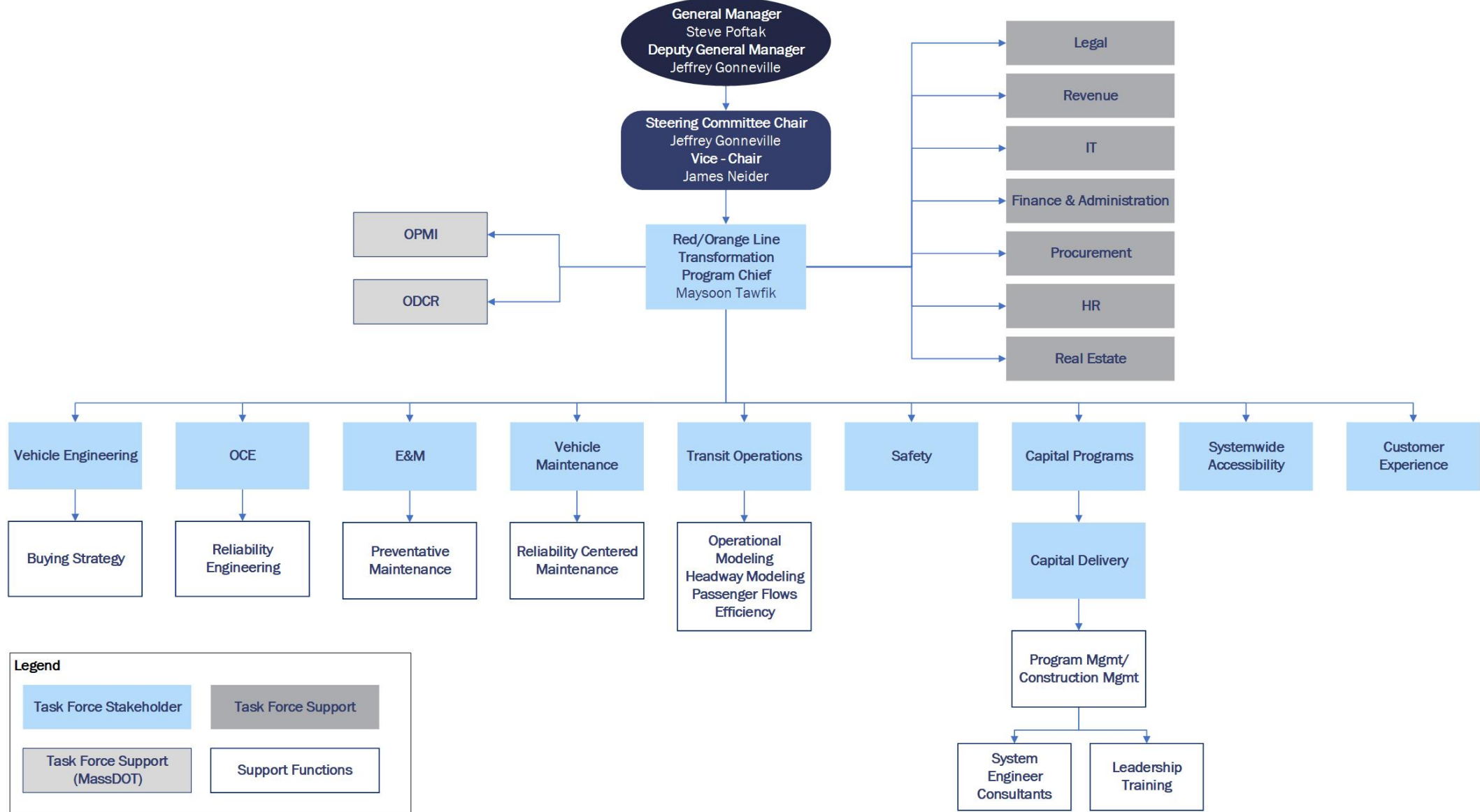


Red/Orange Line Transformation Program Update

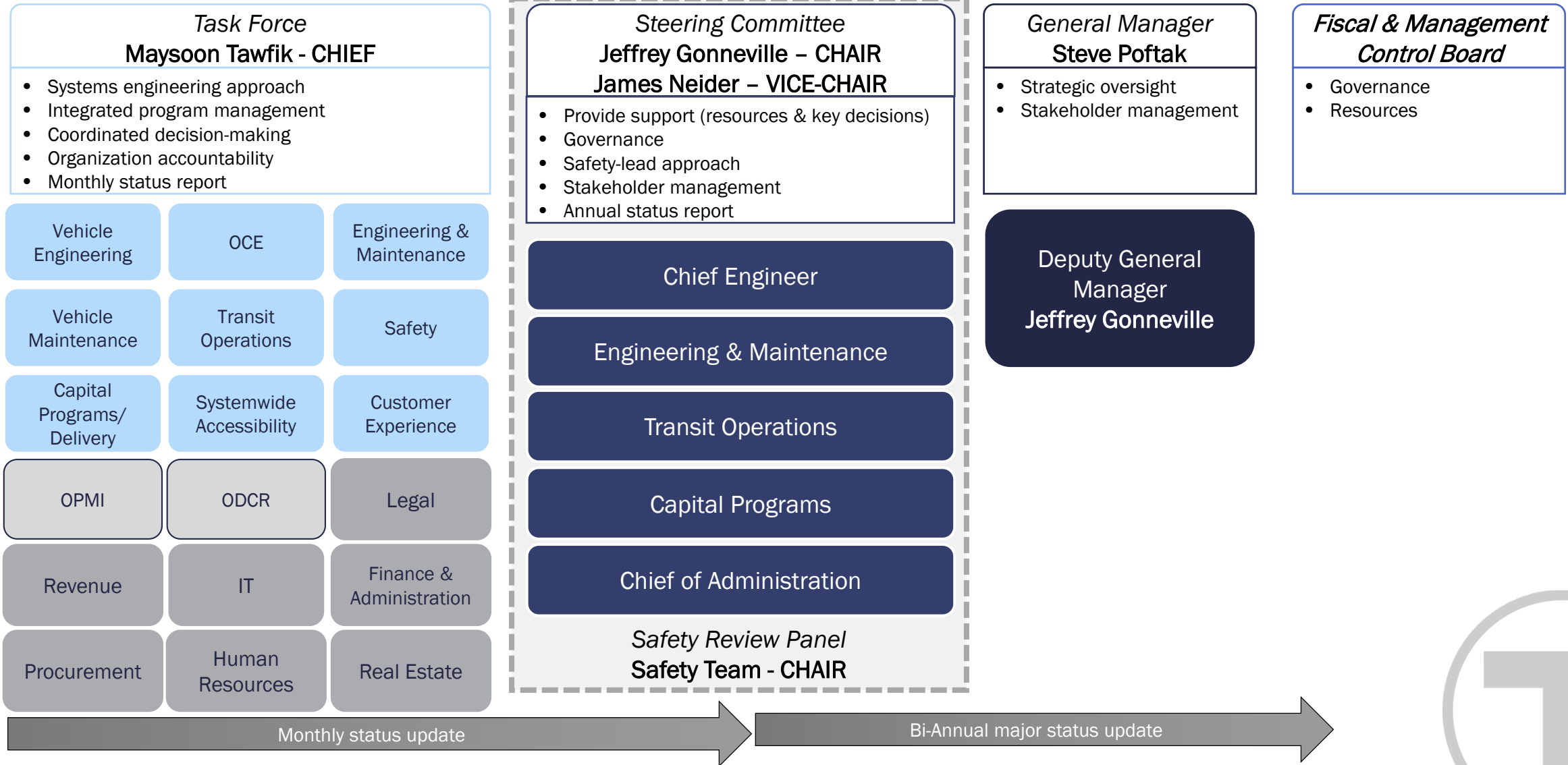
- Finalize comprehensive, critical path schedule of major milestones by December 2020
- **Key activities added to strategy since December 2019:**
 - Risk Assessment
 - Asset Management
 - Track and power renewal approach
 - Passenger facilities assessment process
 - Operating budget assessment process
- 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



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

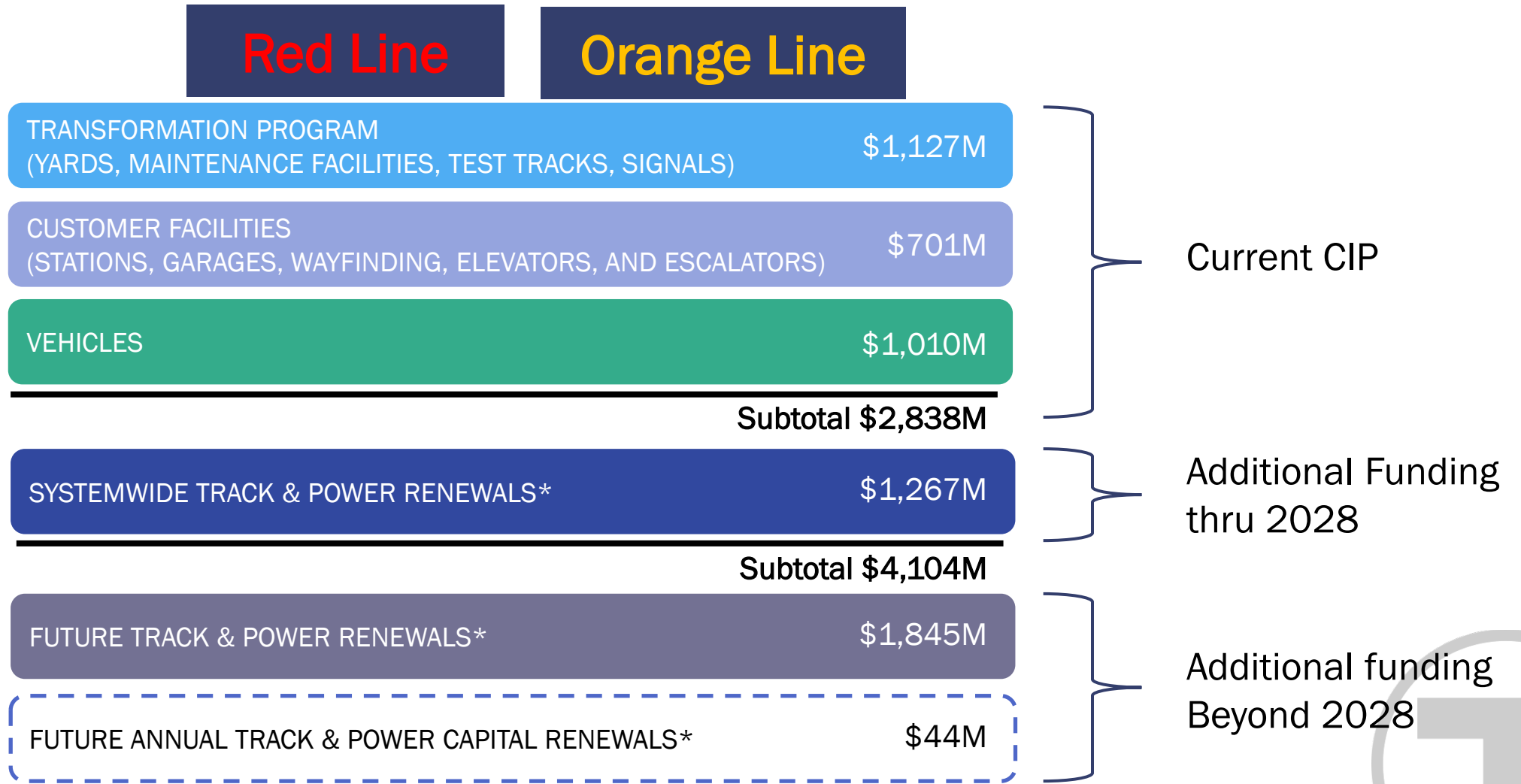


Red/Orange Line Stations Funding Current and Unfunded (Since 2015)

- 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 Capital Investment Current and Unfunded (Since 2015)

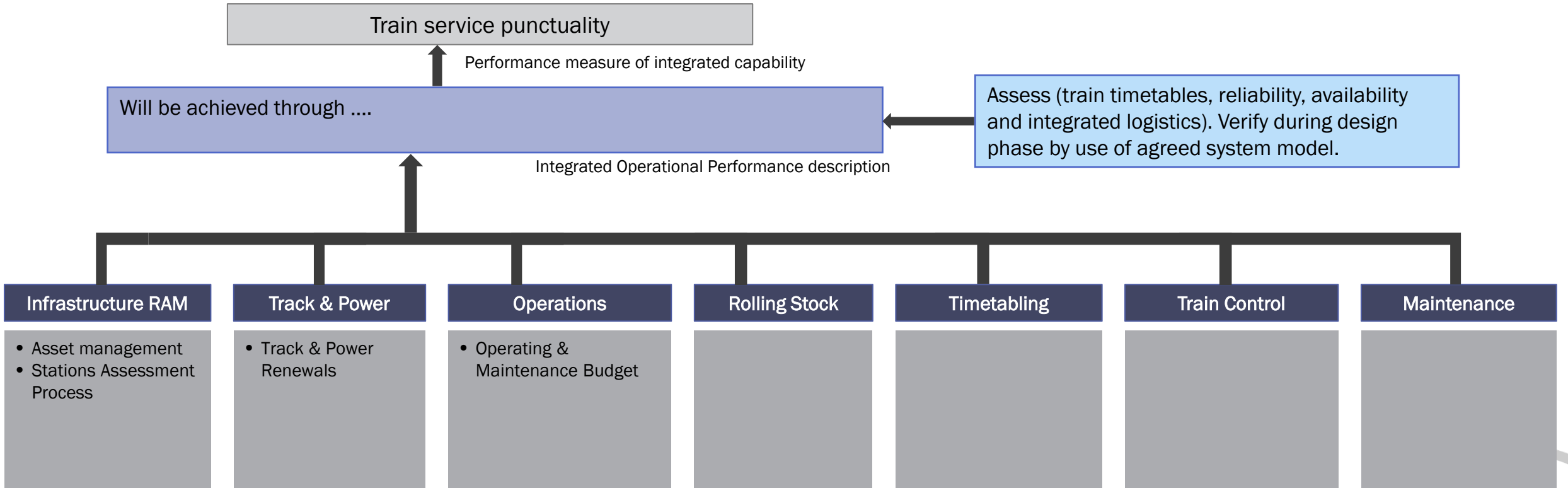


*estimated amount



Road Map of Systems Integration Practices

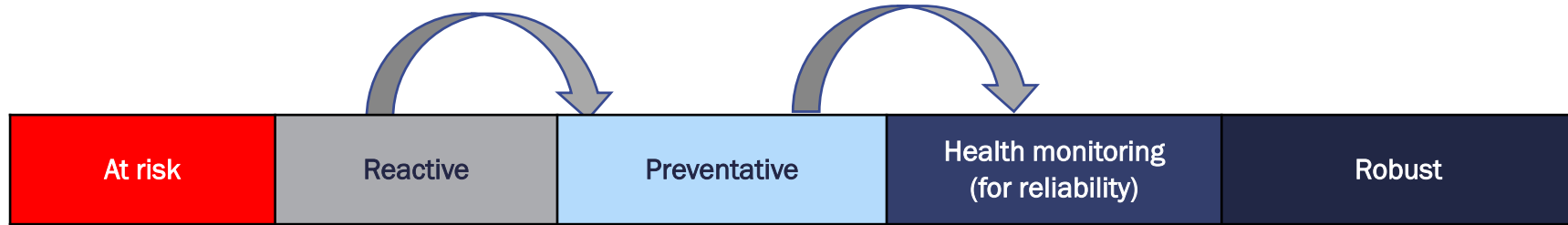
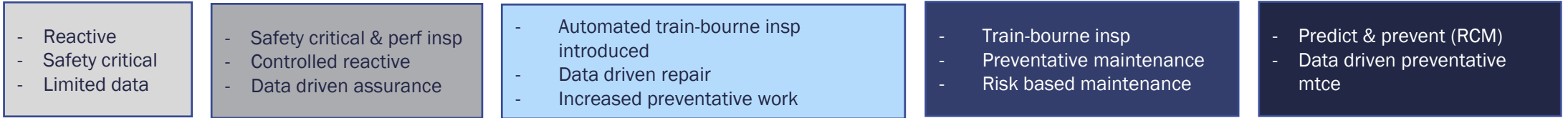
Mapping Integrated Network Performance across Network Elements



RAM: Reliability, Availability, Maintenance



Asset Management Strategy



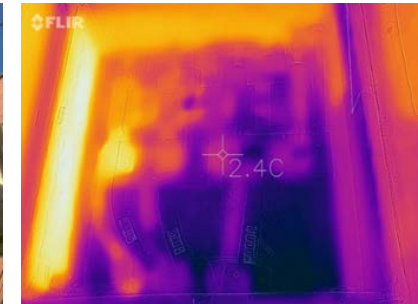
Find and Fix

- 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

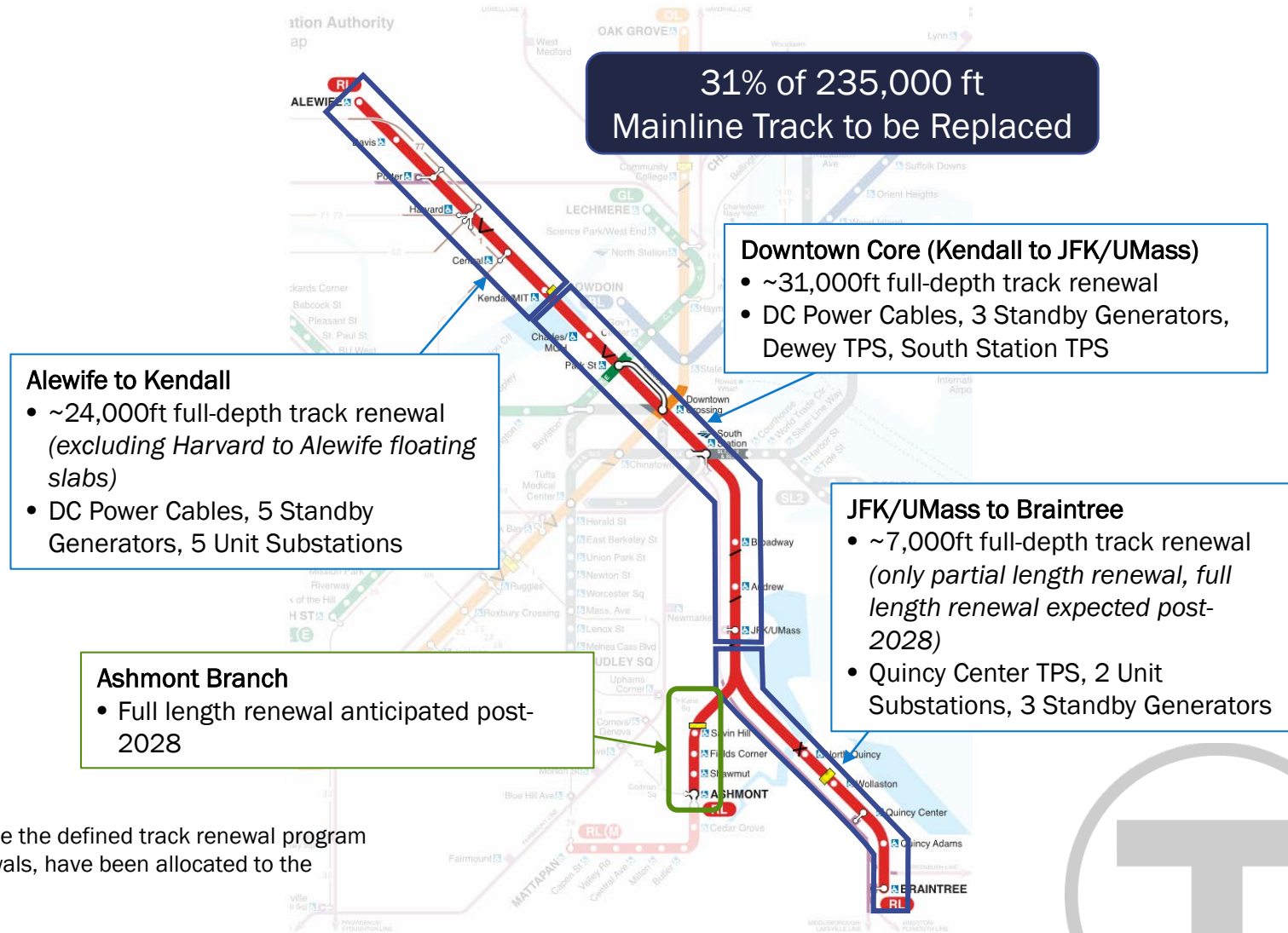
Full-Depth Track Renewal

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.

64% of 107,000 ft Mainline Track to be Replaced

North Station to Oak Grove

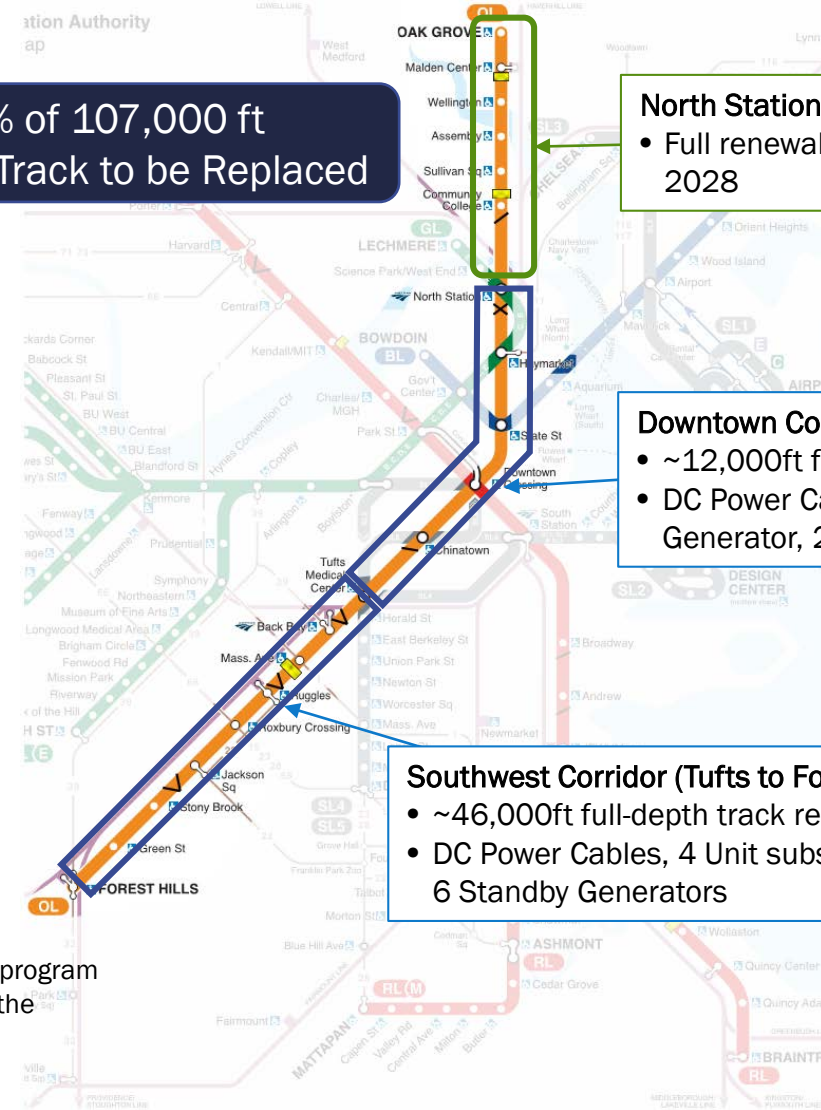
- Full renewal anticipated post-2028

Downtown Core (North Station to Tufts)

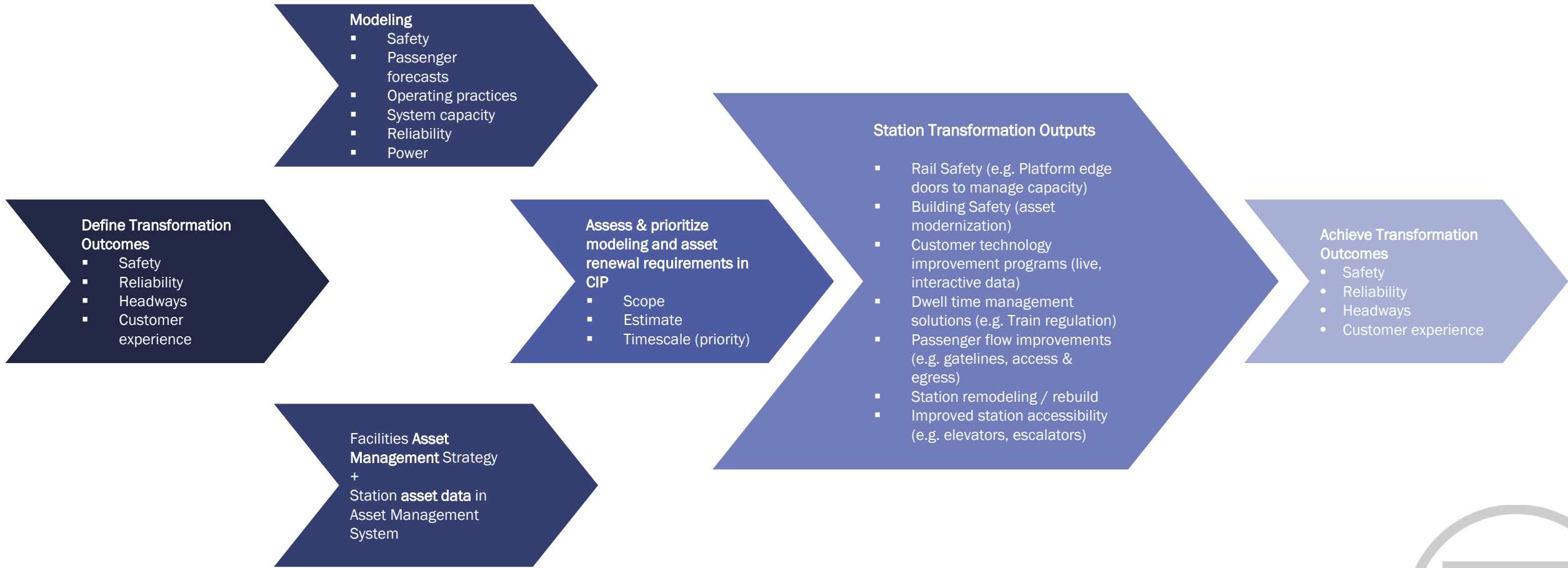
- ~12,000ft full-depth track renewal
- DC Power Cables, 1 Standby Generator, 2 Unit Substations

Southwest Corridor (Tufts to Forrest Hills)

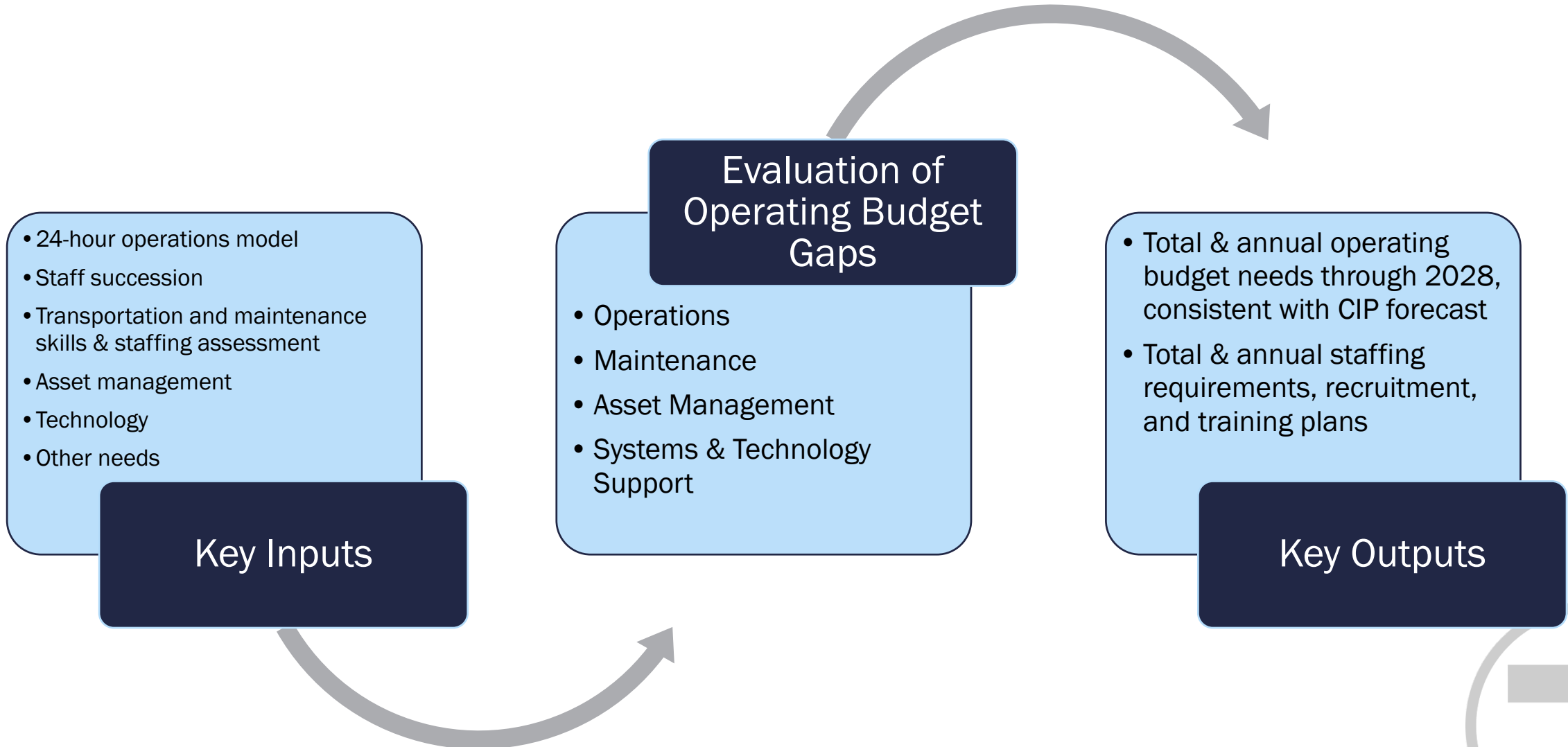
- ~46,000ft full-depth track renewal
- DC Power Cables, 4 Unit substations, 6 Standby Generators



Stations Assessment Process



Operating and Maintenance Budget



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

