Massachusetts Bay Transportation Authority

Regional/Urban Rail Transformation Update

Fiscal and Management Control Board

January 25, 2021

Alistair Sawers

Transformation Update Agenda

- Objectives
- Program Office & Activities
- Program Look Ahead
  - Deadline-driven Approach
  - Preparation for Operator Re-procurement
  - Illustrative Schedule
  - Potential EMU Pilot
- Next Steps
  - Planning

Objectives

Transformation Resolution

- Phase One transformation of:
  - Providence Line - Regional rail
  - Fairmount Line - Urban rail
  - Boston to Lynn (EJ Line) – Urban rail
- Dense corridors:
  - 15-20 min headways
- Others:
  - “Appropriately scheduled” all day service
- Largely electrified
- Integrated with bus/subway
- Improved parking & first/last mile connections
- Include high level accessible platforms
- Start with business case & schedule

Operating Contract Re-procurement

- Transformative operating company (OpCo) contract
- 2025 expiration
- One year extension option
- Optimize bidder’s risks that are under MBTA control
  - Improvements and replacements before re-procurement lower risk and reduce bids or make contract more attractive
  - Need defined asset management & replacement plans
  - Need clarity on operator scope & role in procurement of replacements

Program Office & Activities

Rail Transformation Office

- New office director – Alistair Sawers
  - 26 years of European & US rail megaproject planning and procurement experience
  - Projects include LAX airport people mover, planning for California High Speed Rail, advising UK Department for Transport on leasing & operator procurement
- Part of Railroad Operations
- Targeting 3 additional hires of 5 proposed in 2021
- Completing Rail Vision report with a COVID addendum
- Taking over strategic planning work for Operating Contract re-procurement

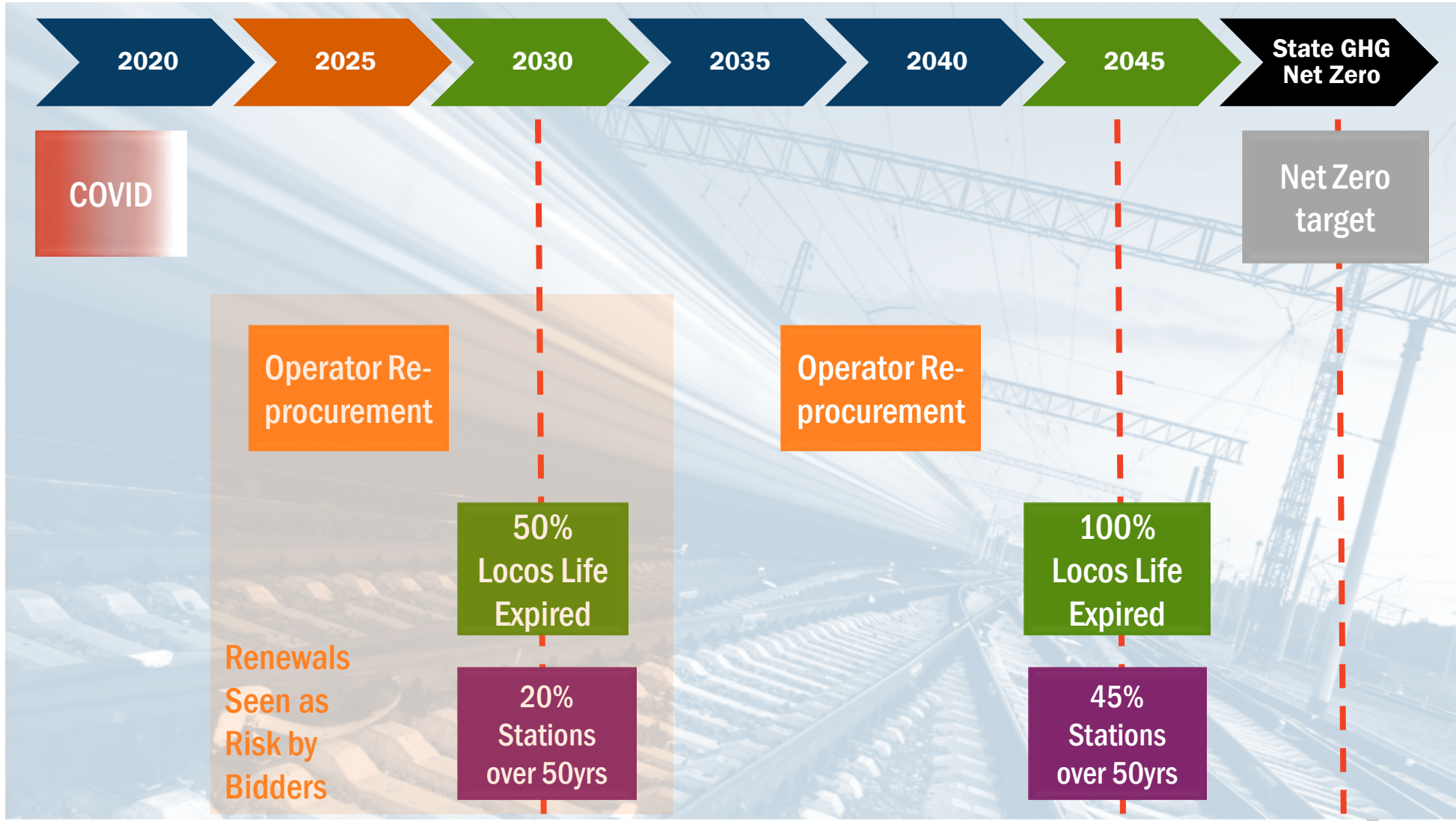
Existing Procurements/Initiatives

- Design standards
- Electric Multiple Unit (EMU) rolling stock RFI
- South Side Heavy Maintenance Facility (HMF) design
- Worcester triple track design
- Ballardvale station & double track planning
- Service schedule pilots
- Forging Ahead service planning
- Overnight layover planning & projects

Come back better

Program Look ahead

Deadline-driven Approach



Deadline – Aging Locomotive Fleet

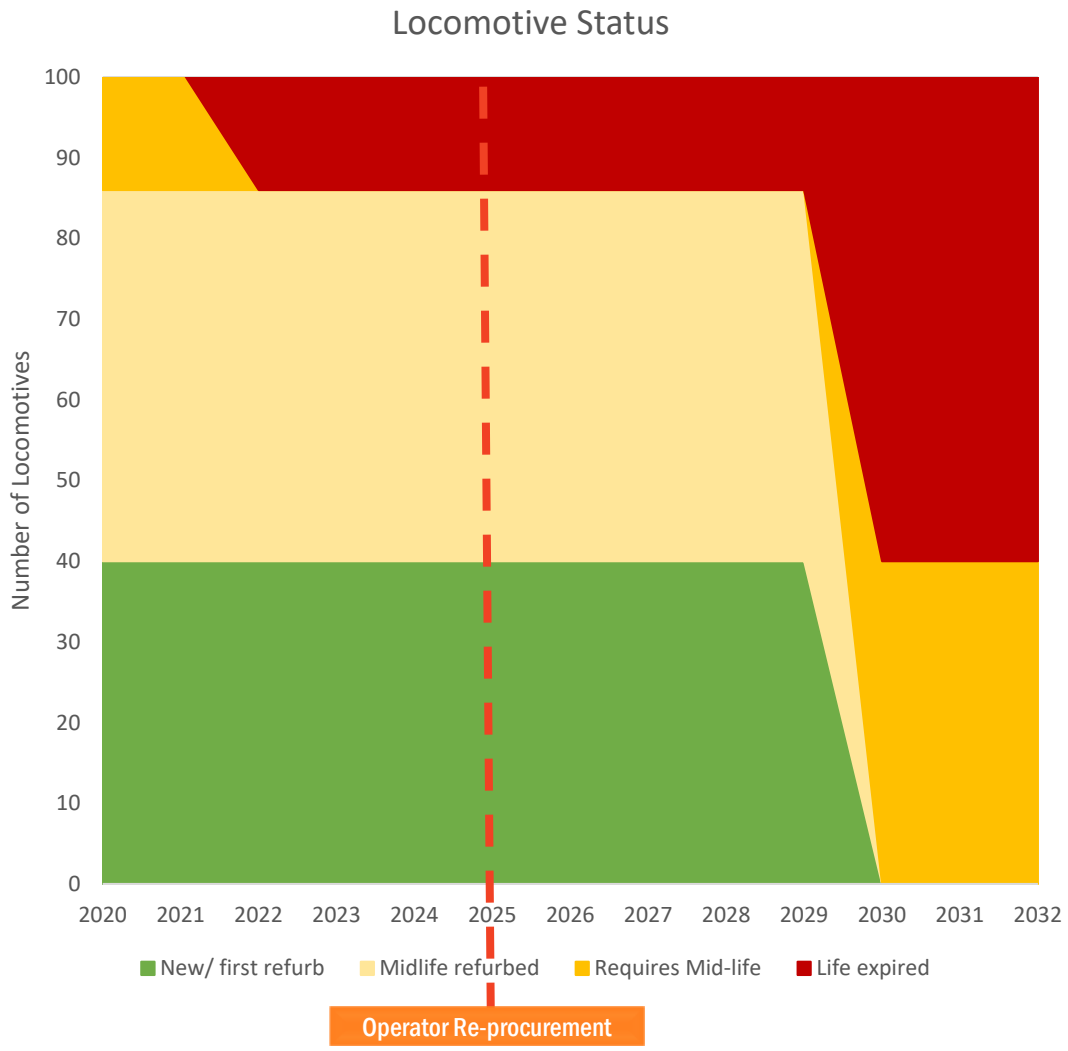


Illustration of potential cliff by 2030

- Assuming GP40s (built 1974) mothballed and eventually retired
- F40-3C (built 1980s) just rebuilt again to give 10yrs of additional life and Tier 0+ emissions status
- HSP46 are Tier 2 but need first refurb soon and midlife before 2030
- Significant risk emissions requirements are tightened before 2030
- By comparison, current federal regulations require Tier 4

Preparation for Operator Re-procurement

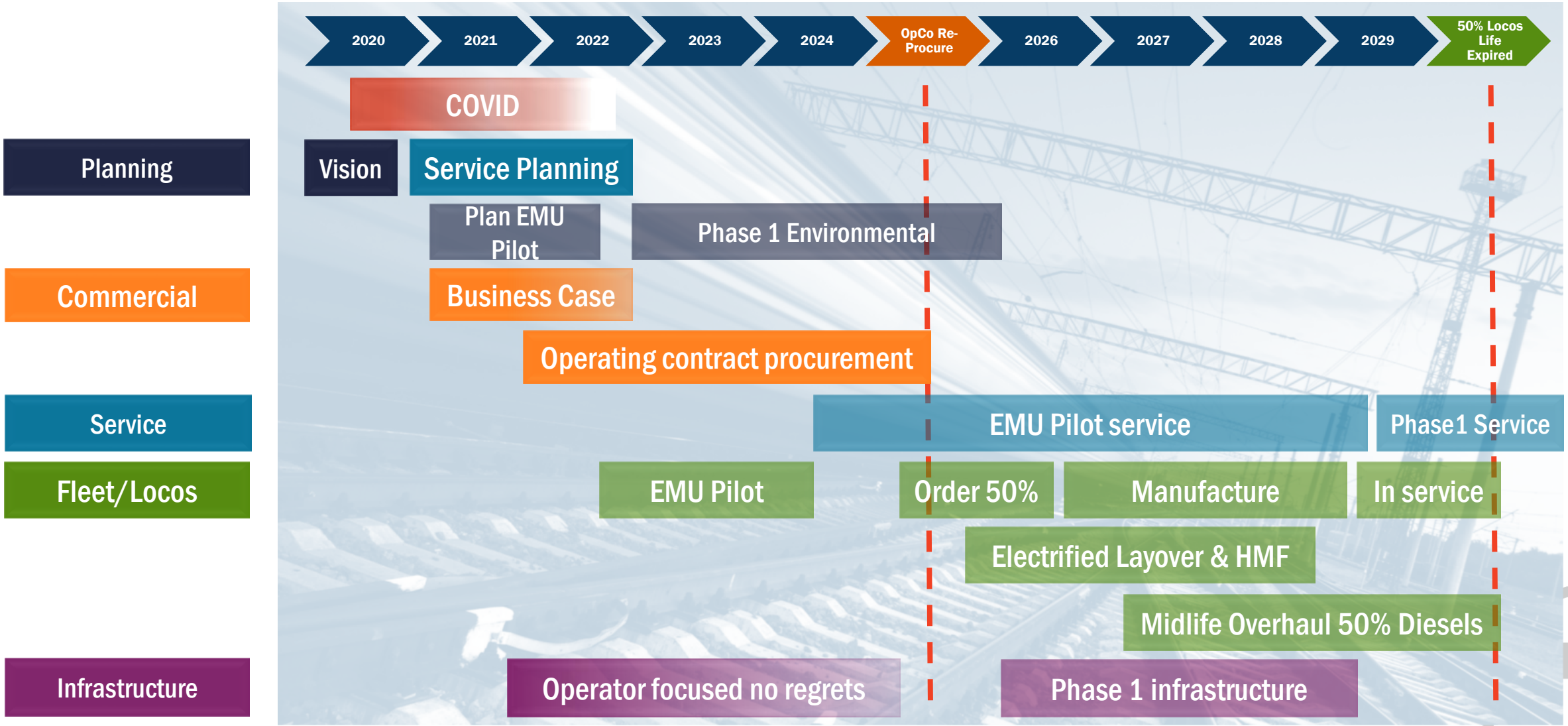
Issues that impact bidder risk

- Condition of network and equipment:
  - Locomotive life expiration & midlife refurbishment
  - Signal systems life expiration
  - Station condition
  - State of station access & parking
  - Sufficiency of layover
  - State of maintenance facilities
  - Ability to deliver desired service with equipment provided
  - Framework to upgrade equipment/infrastructure to deliver service requirements
- Scope of operator contract:
  - Responsibility for pilot service
  - Introduction of new services
  - Role in delivery of infrastructure and/or new rolling stock

Preparation – no regrets investments

- Prepare asset data
- Fleet & facilities plans
  - Life expired equipment replacement
  - Midlife overhaul plan
  - Maintenance Facility
  - Layover facilities
- Infrastructure plans
  - Station repair and upgrade program
  - Track capacity upgrades to enable more frequent service
  - aging parts of signal system not included in PTC/ATC

Illustrative Schedule



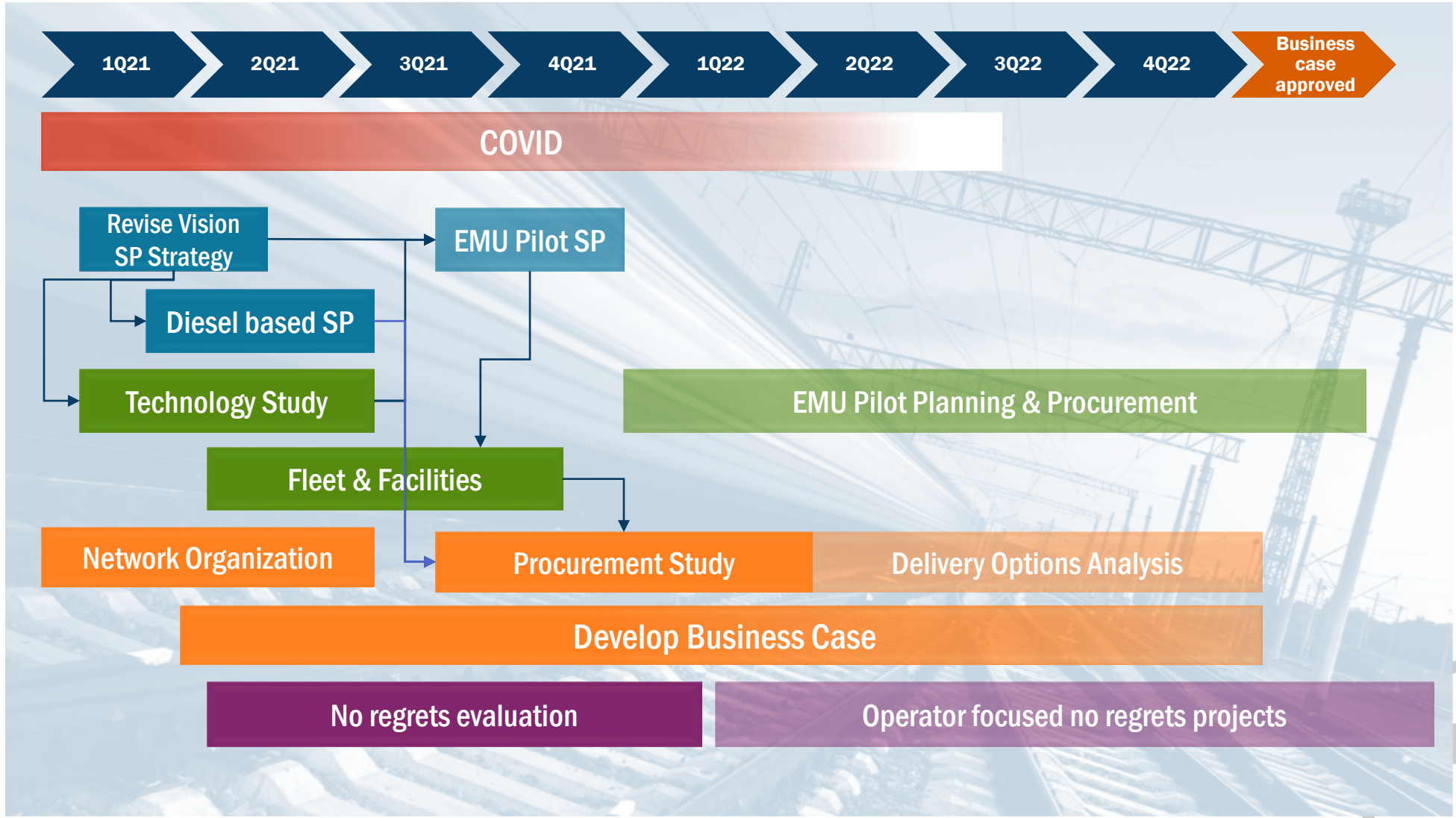
Note: Pale box signifies not programed

Potential EMU Pilot

- Providence Line already electrified to Providence
  - Missing 1.7-mile gap at Attleboro station is being filled
  - Potential need for additional feeder supply is being modeled
- Acquire or lease existing Buy America compliant rolling stock
  - Study potential modifications required to infrastructure
  - Investigate major procurements that have unneeded options which may be transferable
- Layover & maintenance facility
  - Explore interim light maintenance options
  - Develop plans to electrify existing layover at Pawtucket
- Coordinate with Amtrak

Next Steps

Planning Sequence



Note: Pale box signifies pending programing decisions

Next Steps in 2021

Medium-Term

- Hire RTO planning staff – 3 FTEs
- Operator re-procurement preparation
  - Network organizational structure & governance strategy
  - Fleet life expiration planning
  - Infrastructure needs to reduce operator risk/lower bids
  - Present interim update to FMCB in April
- Service plan for diesel push-pull equipment
- EMU Pilot feasibility and procurement planning
  - Develop proposed approach and explore funding options
  - Present update to FMCB in May or June

Long-Term

- Business case
- Updated Service Planning
  - Update strategy from Rail Vision
  - Pilot service plan
  - Future technology service plan
- Detailed technology & electrification study
  - Technology survey
  - Segment specific whole life cost comparison
  - Rail decarbonization roadmap
  - EMU pilot electrification needs
- Fleet & Facilities study
  - Overall fleet strategy, leasing options
  - Layover and maintenance needs

Appendix

Rail Vision Study Goals

Match service with growth & changing needs of the region

Enhance economic vitality

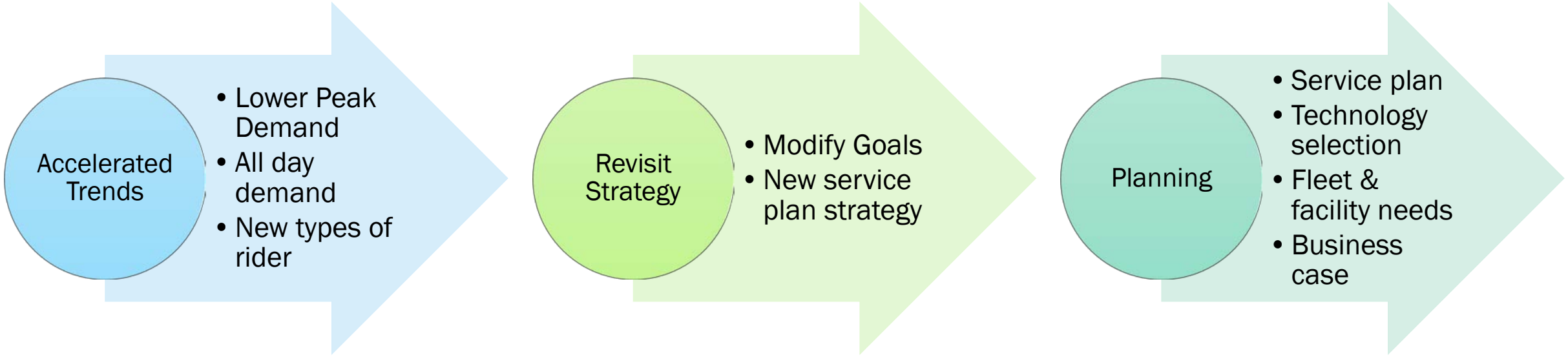
Improve passenger experience

Provide an equitable and balanced suite of investments

Achieve climate change and sustainability targets

Maximize return on investments

Impact of Pandemic Uncertainty



Rail Vision Service Concepts

- Regional rail
  - “Clock face” scheduling
  - Local stopping service
    - All day bi-directional service
    - 20-30 minute headways
  - Express service
    - Non-stop or skip-stop peak service
    - Focused on peak demand
- Urban rail
  - High frequency bi-directional service
  - 15-20 minute headways
  - Rapid transit fare structure

Short-term Objectives

Match Service to Demand

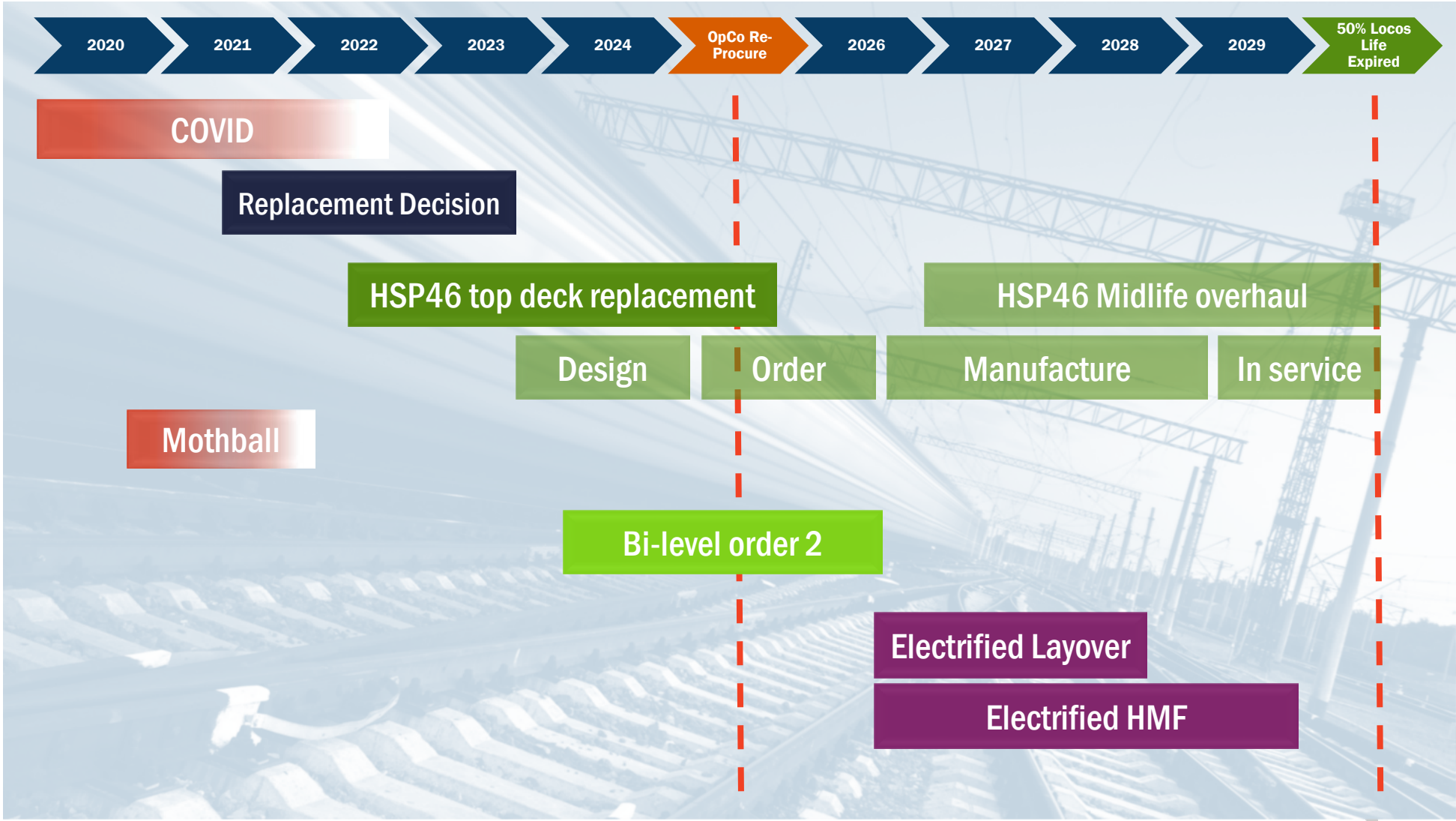
- Urban rail
  - better service now for EJ communities
- Regional rail
  - spread peaks to support flex commutes and regional short trips
  - all day local stopping service for short trips outside Boston metro area
- Commuter only
  - service sized to demand with express options

Target benefits

- Better service now
- EJ ridership growth
- Support CO_2 reduction roadmaps
  - Equipment choices
  - Providing alternative to reduce EJ impact of roadway pricing
- Air quality improvement
  - Pollution potentiates COVID
- Reduce operating costs
  - More efficient use of existing equipment & staff
  - Invest in track upgrades and efficient rolling stock
- Prepare to come back better
  - Better schedule, journey times
  - Higher-quality, safe experience
  - Capacity still matched to demand

Rolling Stock

Base Needs Schedule



Infrastructure

Deadline – Aging Stations

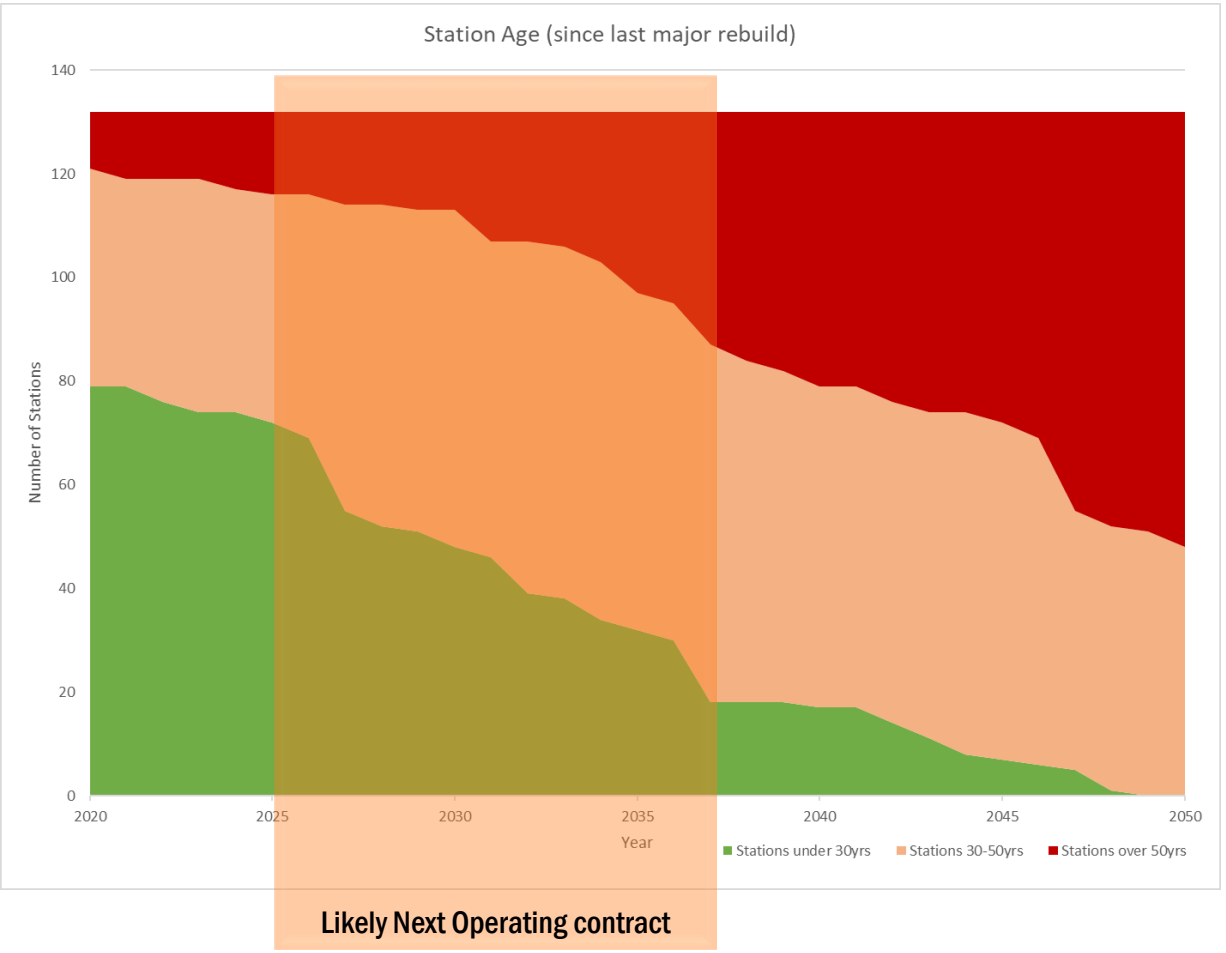


Illustration of potential cliff at 2035

- Station age less directly linked to condition than to locomotives
- Ages based on initial Keolis reviews as asset management data are still being validated
- By 2031, more than 20% of stations will be life expired based on a lifespan of 50 years
- By 2045, more than 45% will be over 50 years old

Business Case

Business Case Structure

- Strategic Case
  - Rail Vision report with pandemic update
  - Messaging/outreach document
- Management case
  - Organizational capacity assessment
  - Risk management plan
- Financial Case
  - Funding and finance plan
- Commercial Case
  - Network organization and governance plan
  - Procurement plan
- Economic Case
  - Economic impact study
  - Cost-benefit analysis

Business Case Needs

Rail Vision & FMCB resolution covered:

- High-level vision and goals
- Phase 1 initial definition
- Outline operational strategy
- Farebox revenue forecasts
- High-level capital and O&M cost forecasts

Topics to be addressed:

- Phasing of electrification and EMU rollout
  - Infrastructure – technology steps
  - Fleet facilities – staged rollout and cascades
  - Low level operational strategy and service plan
- Financial Plan
- O&M and capital cost refinement
- Fare, parking fee strategy and forecasts
- MBTA organizational capacity assessment
- Risk management approach