



RAIL VISION

MassINC Transformative Transit-Oriented Development

MAY 21, 2019



Presentation Agenda

- Project Overview
- Seven Service Alternatives
- Example Operations Analysis
- Next Steps

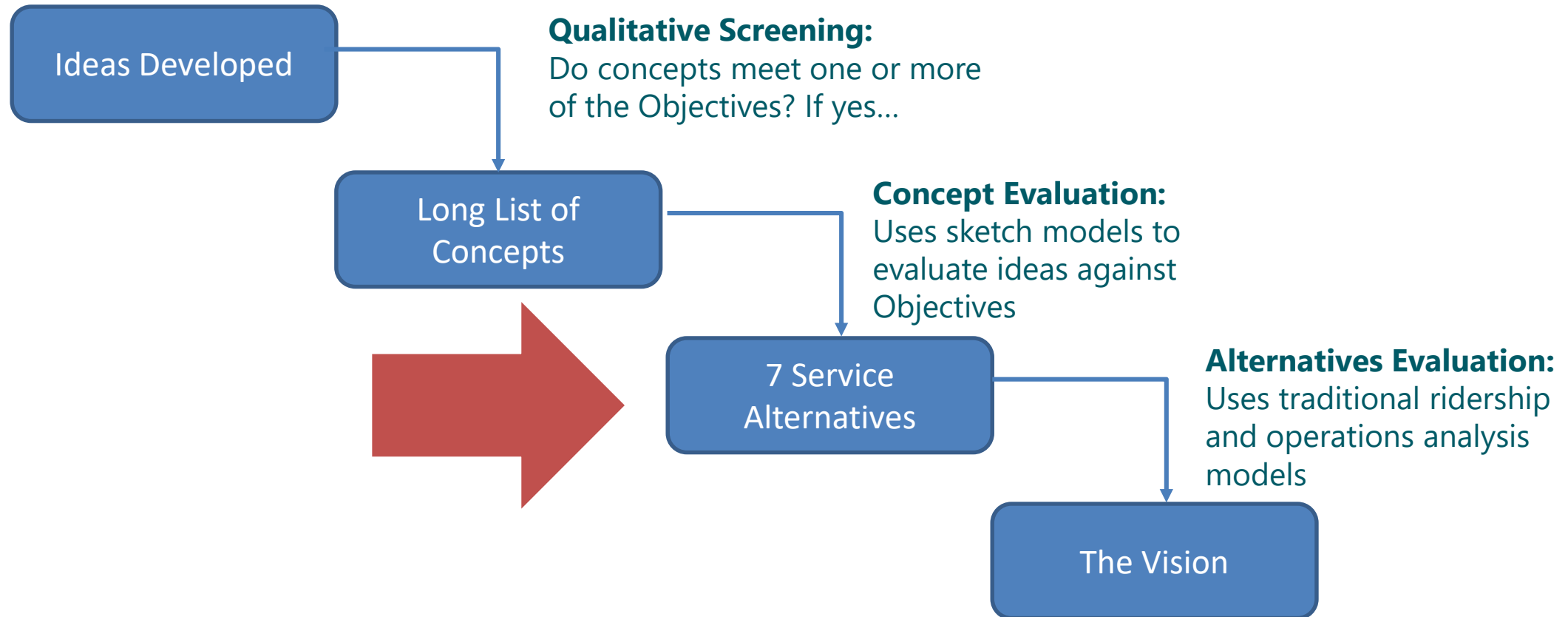
Project Goal

Leverage the MBTA's extensive commuter rail network to best meet the transportation and economic growth needs of the region.

Project Objectives

1. Match service with the growing and changing needs of the region
2. Enhance economic vitality
3. Improve the passenger experience
4. Provide an equitable and balanced suite of investments
5. Help the Commonwealth achieve its climate change resiliency targets
6. Maximize return on investment (financial stewardship)

Where We Are Now



Elements Covered in Rail Vision Service Alternatives

Alternatives aim to **reduce travel time, increase service frequency, and improve system connectivity** based on results from the first phase

Alternatives to consider mix of service and investment elements:





- New vehicle technology
- System electrification
- High level platforms
- Station typology and frequency
- Double and triple tracking
- Facility needs and expansions
- Station locations
- More express service
- Span of service
- Transfer hubs
- Operational feasibility
- Order of magnitude operating and capital costs

Station Typologies

Alternatives will consider a mix of service and investment elements to provide higher levels of service to:

- **Key stations**, due to their density, regional access, and transit connectivity
- **Inner core stations**, in and around Boston
- **Outer stations**, outside the Inner Core

Typical Characteristics of Key Stations

| | |
|---|---|
|  <p>Density</p> <p>Stations in Gateway Cities, downtown areas, town centers, and high-density locations can support frequent service.</p> |  <p>Regional Access</p> <p>Proximity to the roadway network with sufficient parking allows stations to draw passengers from across the region.</p> |
|  <p>Ridership</p> <p>Currently one of the 5 highest ridership stations on the line or branch.</p> |  <p>Transit Connections</p> <p>Stations improve transfers to/from public transportation, increasing connectivity to and within the MBTA system.</p> |

High Level Platforms / Accessibility Upgrades

- Existing system has a mixture of platform types:
 - **High-level**, with a level boarding surface
 - **Mini-high**, with a portion of the platform at a high-level to provide a level boarding surface
 - **Low-level**, requiring use of stairs or ramp
- High-level boarding and powered doors on trains could reduce dwell times at stations
- The project will assume different levels of platform upgrades across the alternatives to test a range of capital improvements.



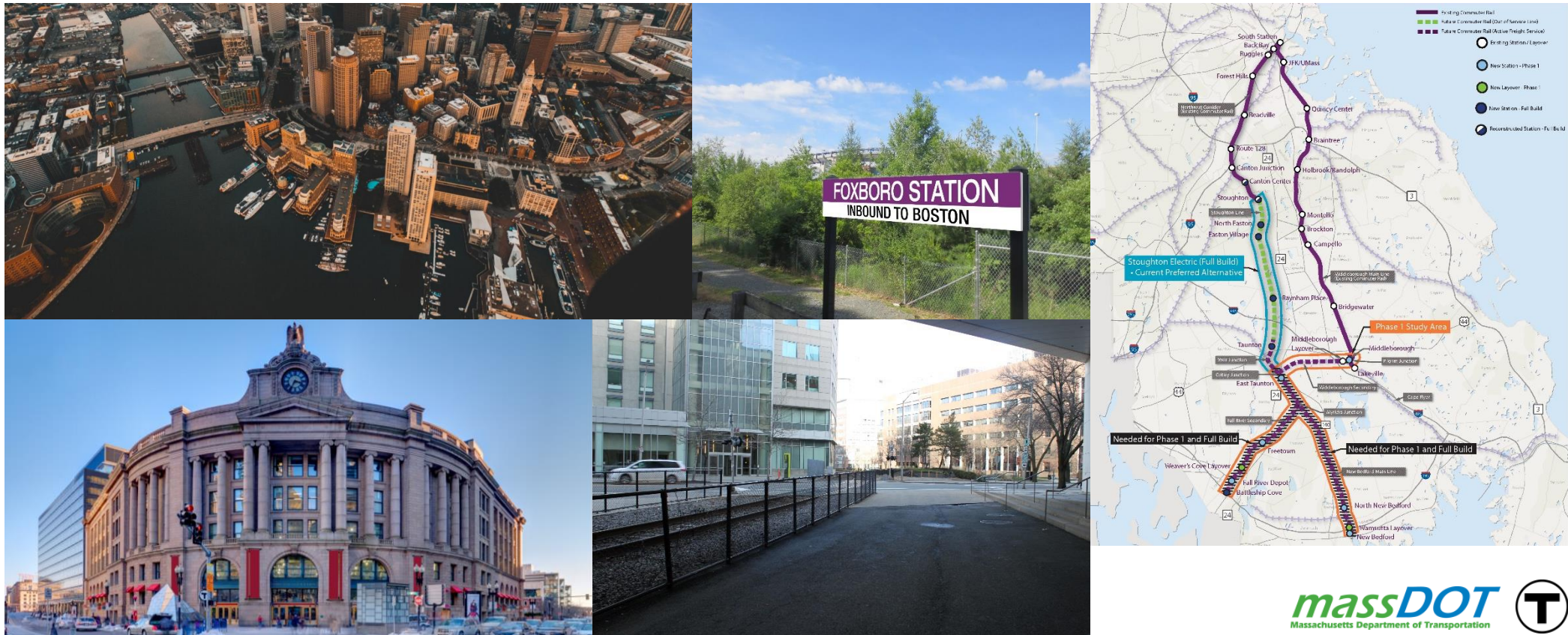
Electrification and Vehicle Technology

- Some alternatives will consider full or partial system electrification
- Vehicle options include locomotives paired with coaches or multiple units (multiple self-propelled vehicles) – either can be diesel, electric, or dual mode
- Vehicle powered by electricity produce lower emissions
- Multiple unit trains can provide travel time savings
- Procurement and O&M costs vary across the range of vehicle types



Terminal Capacity and System Expansions

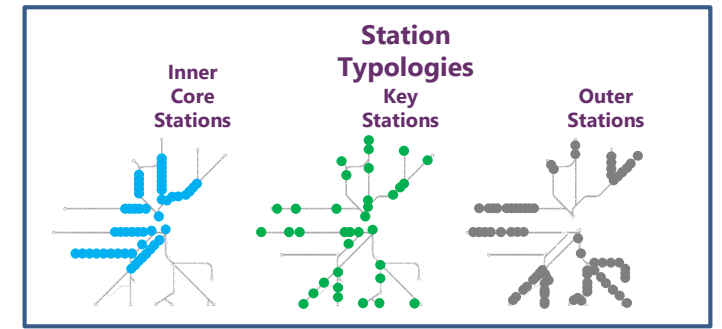
Examples include North South Rail Link, South Station Expansion, South Coast Rail (Phase 1 and Full Build), Foxborough, Grand Junction



Seven Rail Vision Service Alternatives

- Alternative 1: Optimize Existing System
- Alternative 2: Regional Rail to Key Stations (Diesel)
- Alternative 3: Urban Rail (Diesel)
- Alternative 4: Urban Rail (Electric)
- Alternative 5: Regional Rail to Key Stations (Electric)
- Alternative 6: Full Transformation
- Alternative 7: Hybrid System

Comparing Alternatives



| | Typical Frequency (Peak/Off-Peak) | 1: Optimize Existing System | 2: Regional Rail to Key Stations (Diesel) | 3: Regional Rail to Key Stations (Electric) | 4: Urban Rail (Diesel) | 5: Urban Rail (Electric) | 6: Full Transformation | 7: Hybrid System |
|--|-----------------------------------|--------------------------------------|--|---|------------------------|--------------------------|------------------------|------------------|
| Key Stations | | ● 30/60 | ● 15/15 (North Side) ● 30/30 (South Side) | ● 15/15 | ● 30/60 | ● 30/60 | ● 15/15 | ● 30/60 |
| Inner Core | | ● 30/60 | ● 30/60 | ● 30/60 | ● 15/15 | ● 15/15 | ● 15/15 | ● 15/30 |
| Outer Stations | | ● 30/60 | ● 30/60 | ● 30/60 | ● 30/60 | ● 30/60 | ● 15/30 | ● 30/60 |
| Fully Accessible High-Level Platforms | | | | | | | | |
| Key Stations | | Existing or Programmed Upgrades Only | ✓ | ✓ | - | - | ✓ | ✓ |
| Inner Core | | Existing or Programmed Upgrades Only | - | - | ✓ | ✓ | ✓ | ✓ |
| Outer Stations | | Existing or Programmed Upgrades Only | - | - | - | - | ✓ | - |
| Electrification | | | | | | | | |
| Major Expansions | | | | | | | | |

Evaluating relative **benefits and costs** across the seven alternatives will provide the foundation to build **one or more Visions** for the future of commuter rail, which **may combine features from multiple alternatives** to maximize the effectiveness of the MBTA rail network.

Note: The alternatives as described above are subject to change during the modeling process. All text and maps describe a typical application at the system level but may vary to some extent at the line, station, or segment levels.

Alternative 1: Optimize Existing System

Goal:

Assess costs and benefits of providing predictable, bi-directional service every 30 minutes during peak periods and hourly during off-peak periods, with modest investments in new infrastructure

Key Features

Typical Frequency (Peak/Off-Peak)

All Stations: 30/60 bi-directional

Station Accessibility

High-level boarding platforms at stations where they are currently existing or programmed

Electrification

None

Train Type(s)

Diesel Locomotives

Major Expansions

South Coast Rail Phase 1



Alternative 1: Optimize Existing System – Initial Capital Improvements

Stations

- Accessibility Upgrades
- Additional Platform/Track Capacity

Tracks

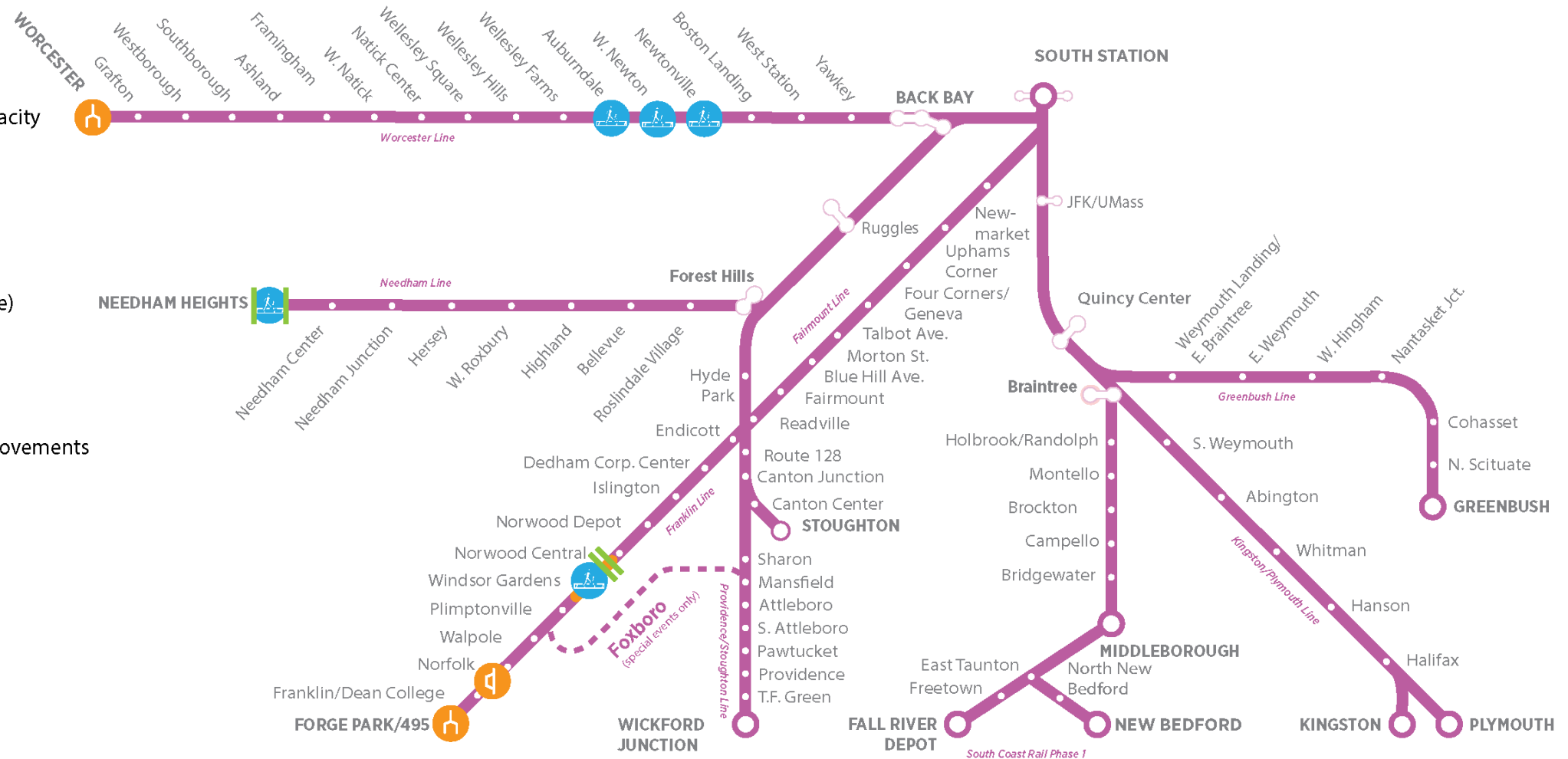
- Turn tracks
- Passing Sidings
- Additional Track (Double, Triple)

Other Improvements

- Electrification
- Grade Crossing or Bridge Improvements

Terminal Improvements

- Terminal Upgrade
- Terminal Expansion
- North South Rail Link



Note: Systems and signal upgrades will be required. Some land acquisition may also be required.

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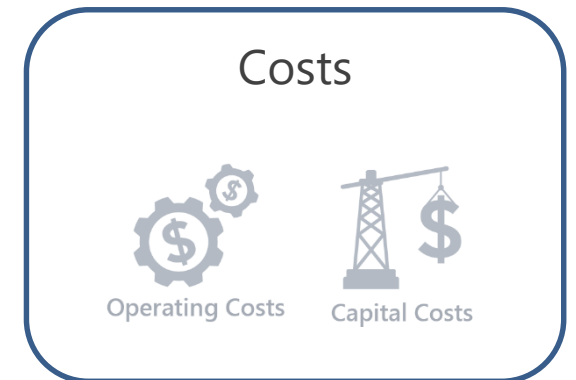
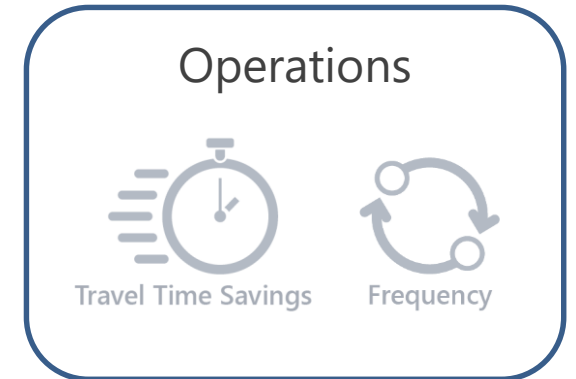
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Next Steps: Alternatives Evaluation

- Complete modeling for operations, infrastructure and capital costs with Rail Traffic Controller (RTC) modeling tools
- Develop robust ridership estimates for all 7 Alternatives using the CTPS Travel Demand Model
- Identify potential land-use and demographic effects of one or more Alternatives using the Regional Dynamic Model (RDM)
- Develop capital and operating cost estimates
- Share results with Advisory Committee and public

Key Results

- Results will be summarized:
 - By alternative
 - For each line (for some metrics)
- Understand for each alternatives:
 - Operations (frequency, travel times, etc.)
 - Infrastructure required
 - Fleet requirements
 - Ridership
 - Costs
 - Benefits (emissions, equity, connectivity)



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