

# RAIL VISION



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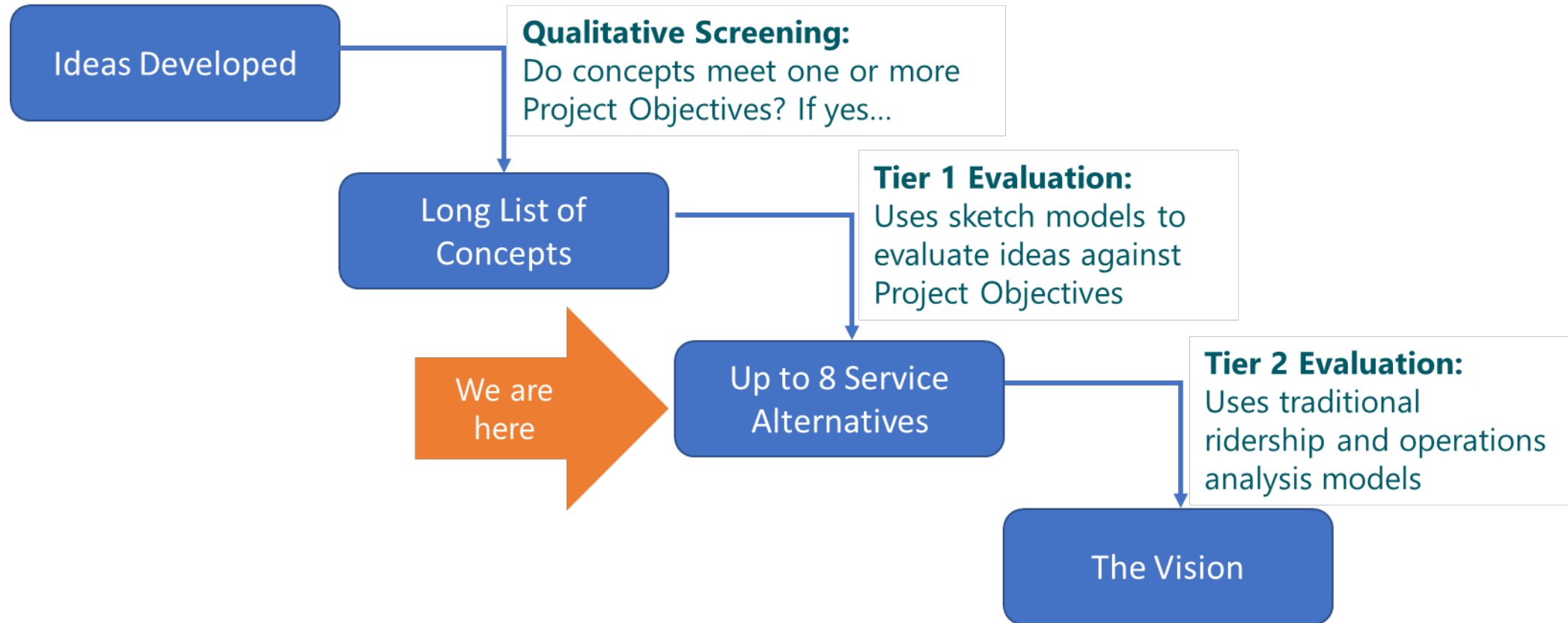
## Advisory Committee Meeting

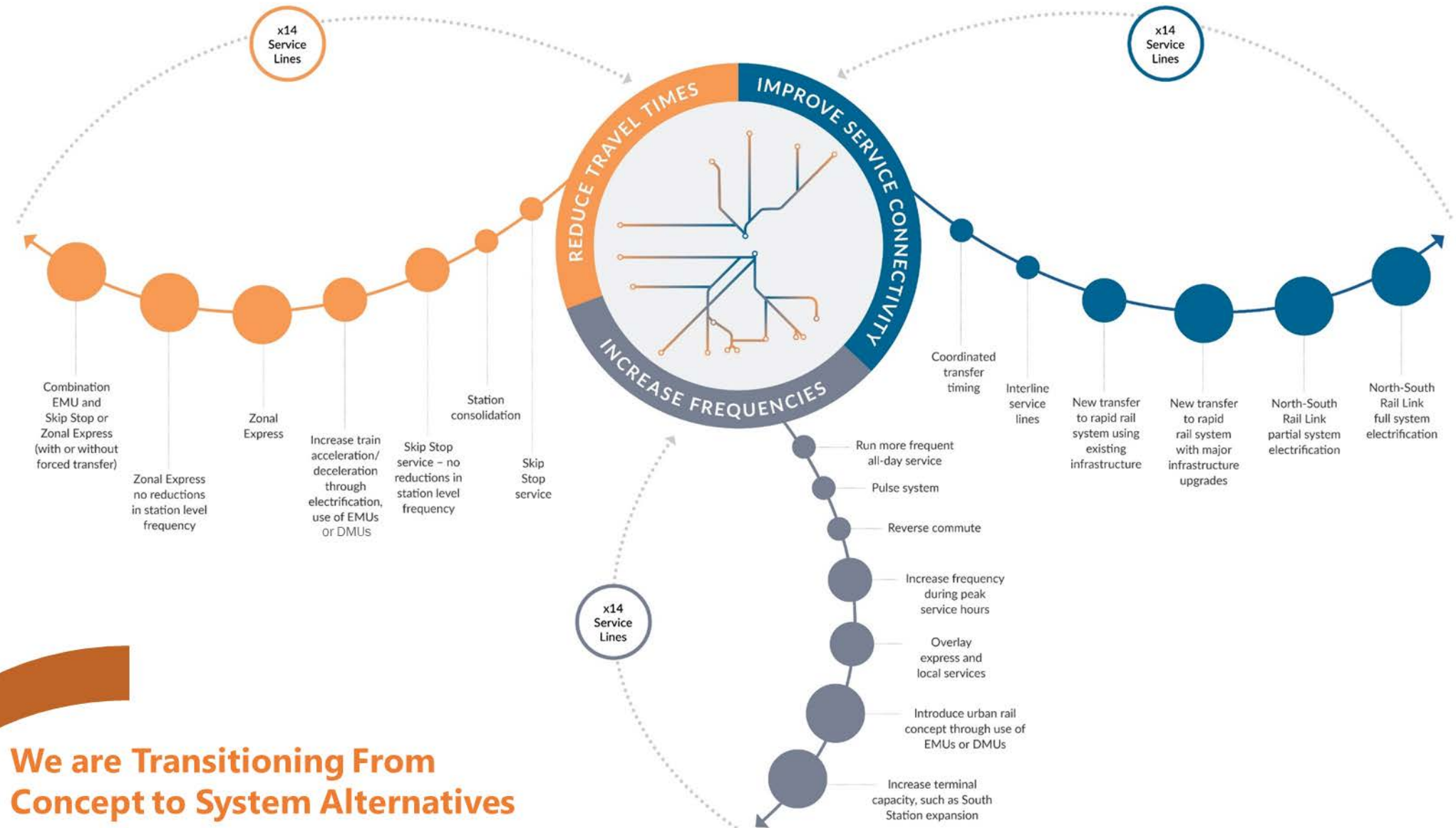
DECEMBER 13, 2018

# Purpose of Today's Meeting

1. Welcome
2. Potential Service Alternatives
3. Other Updates
4. Public Comment

# Evaluation Process







## Potential Tier 2 Service Alternatives

# Purpose of Today's Discussion

- Presentation of initial six systemwide alternatives
- Team is still developing additional alternatives that include line by line optimization based on Tier 1 analysis
- Feedback from Advisory Committee and FMCB (meeting on 12/17) will be incorporated into an updated set of alternatives, which will be presented at January's Advisory Committee and FMCB meetings



# Development of Tier 2 Alternatives

The proposed service alternatives for Tier 2 are informed by

- What we learned from the Tier 1 analysis
- What we heard from the Advisory Committee



# Elements Common to All Alternative Elements

- ✓ More frequent, bi-directional service
- ✓ Infrastructure necessary to support service alternative will be in place
- ✓ Signal upgrades will support service plans (including Positive Train Control system-wide)
- ✓ West Station
- ✓ Haverhill/Lowell Interlining
- ✓ Franklin/Fairmount Interlining



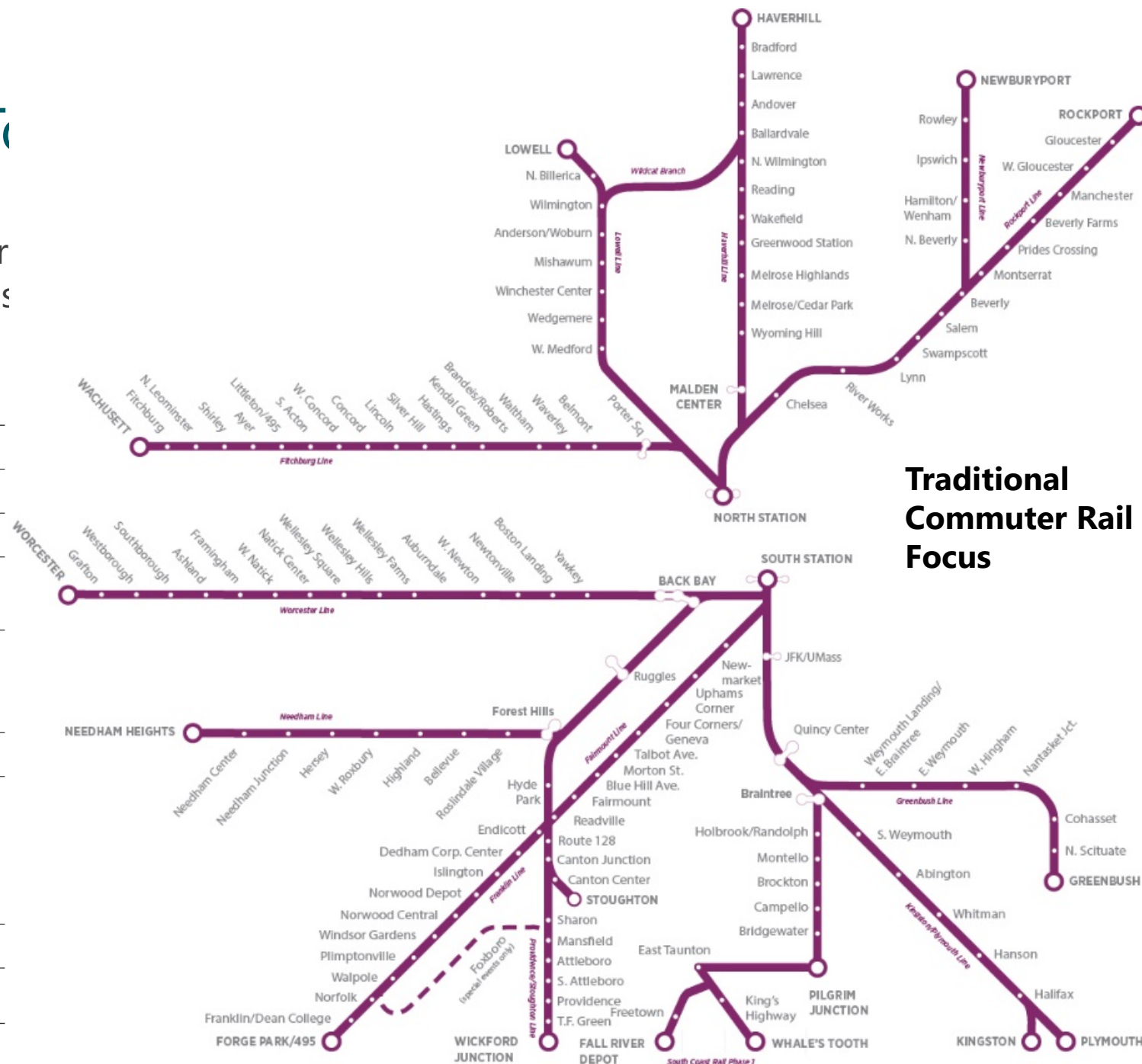
# Variable Elements in Alternatives

- Service Focus (Key Stations, Inner Core)
- Frequency (15, 30, 60 minutes)
- Electrification (Full, Partial, None)
- Rolling Stock (Electric, Diesel, Multiple Units)
- Terminal Capacity (North-South Rail Link (NSRL), South Station Expansion (SSX), Existing)
- System Expansions (South Coast Rail (SCR) Phase 1, SCR Full Build, Grand Junction, Foxboro)
- Additional Interlining
- Station Accessibility

# The System of T

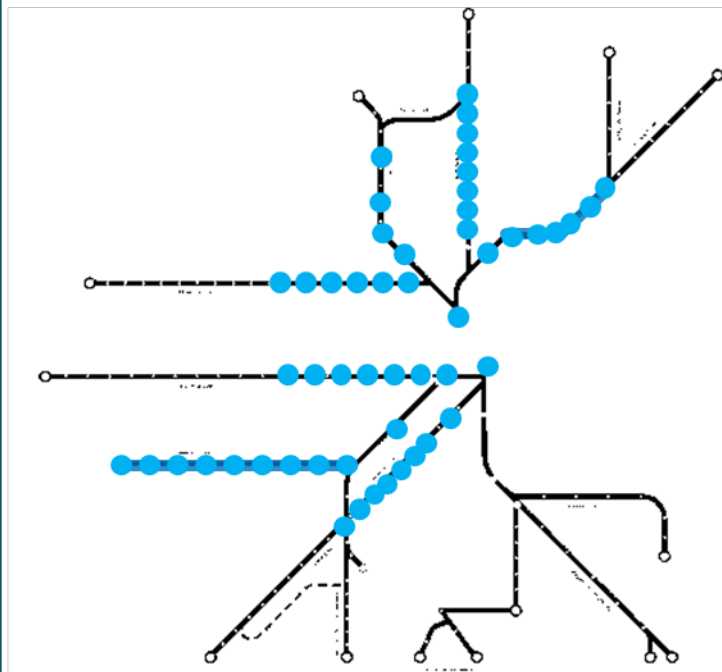
Today's system is largely local service gear trips into downtown Boston. Some Express operates on longer lines.

What Exists Today...or in the Very Near Future	
Typical Frequency	20/60 peak direction
Electrification:	None (Amtrak only)
Rolling Stock	Diesel locomotives (Continual investments)
Terminals:	Existing (North Station, South Station), with North Station capacity upgrades
System Expansions:	N/A
Committed New or Upgraded Stations:	Blue Hill Ave. (Fairmount) Pawtucket (Providence) SCR Phase 1 stations Other station upgrades
Interlining	Haverhill/Lowell (2 trips/day)
Station Accessibility	Mixed



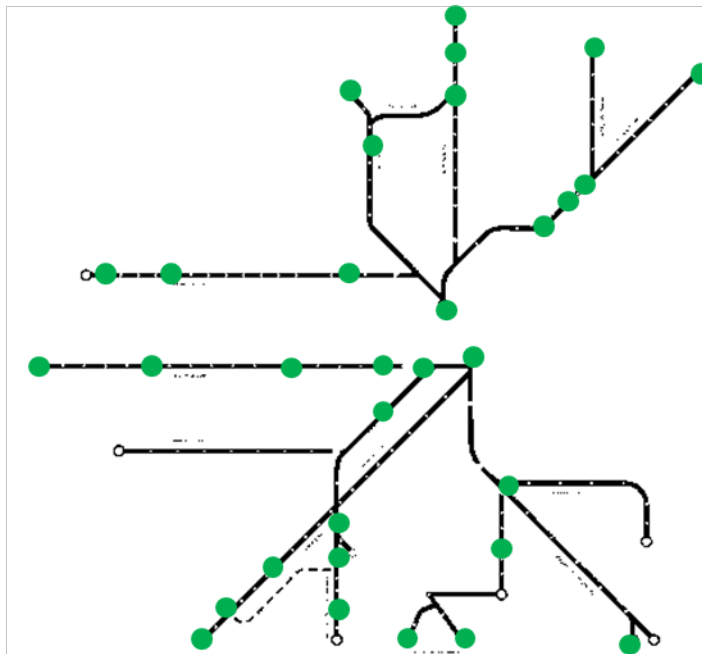
# How the Alternatives Address...Station Typologies

**Inner Core Stations**



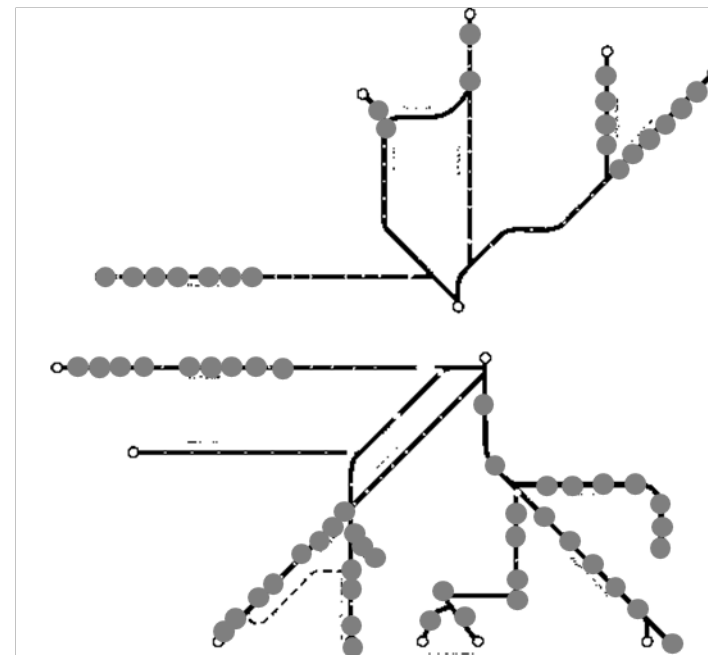
**Locations Served by Urban Rail**

**Key Stations**



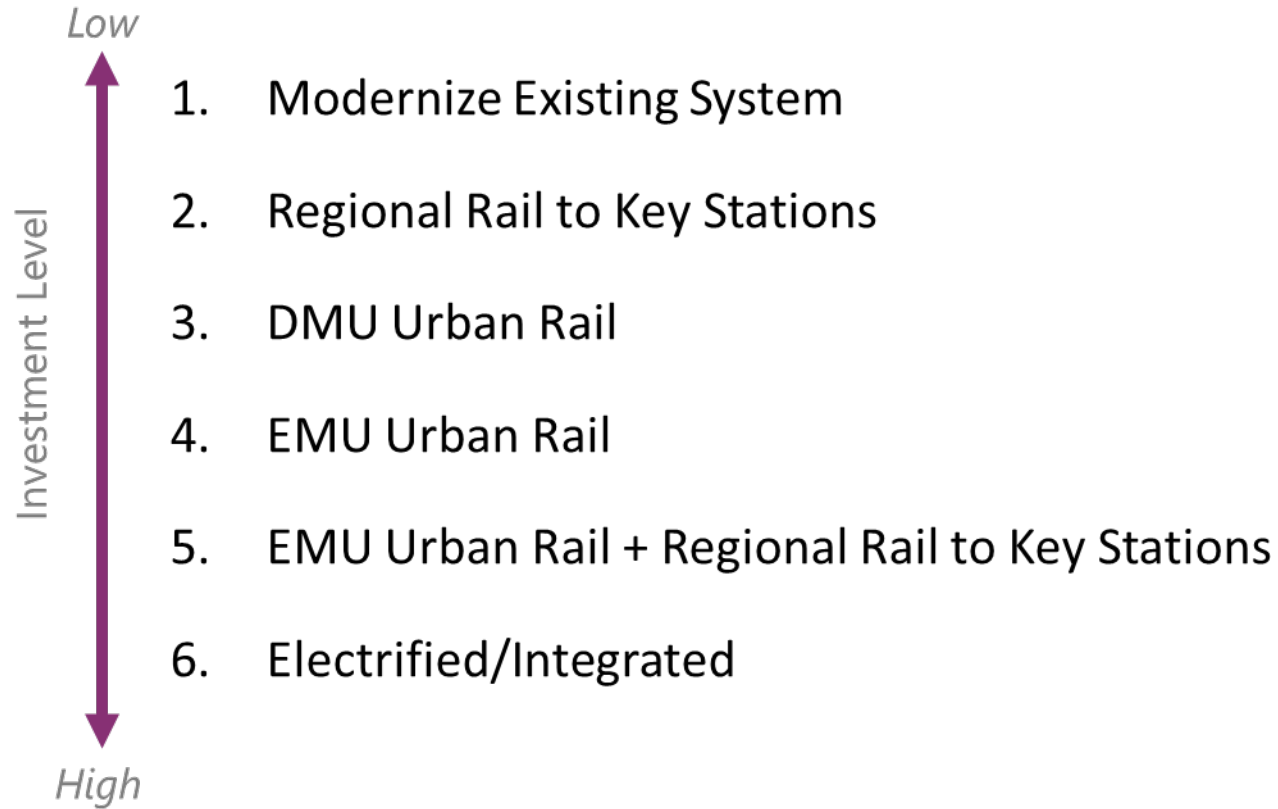
**Gateway Cities, TOD Nodes, and  
High Auto Access Locations**

**Other Stations**



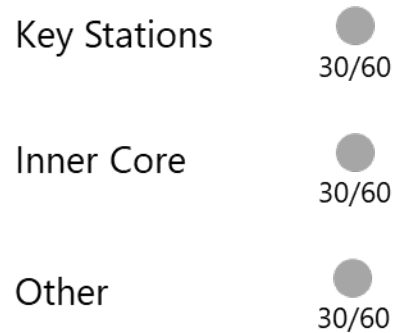
**Regional and Local Locations**

# Potential Tier 2 Service Alternatives

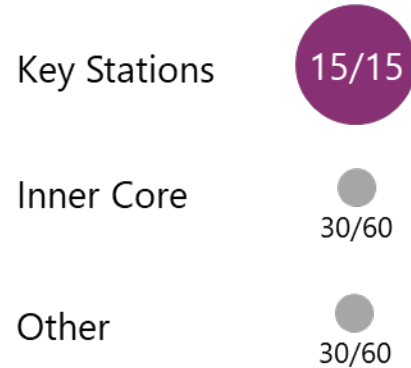


# How the Alternatives Address...Frequency

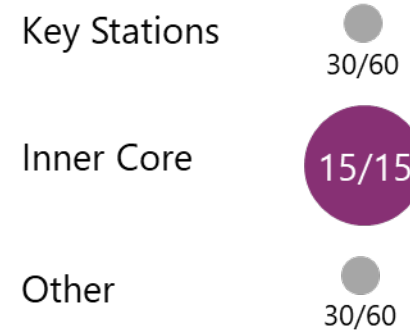
## 1. Modernize Existing System



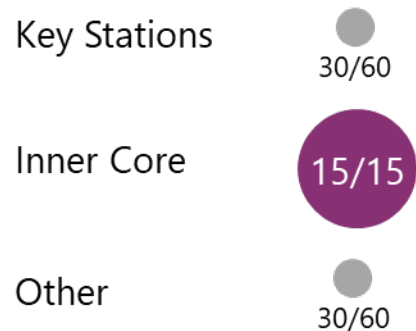
## 2. Regional Rail to Key Stations



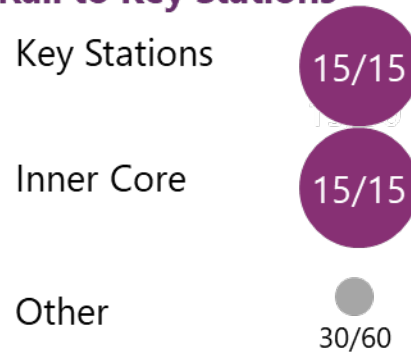
## 3. DMU Urban Rail



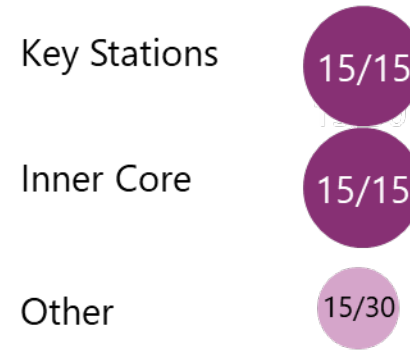
## 4. EMU Urban Rail



## 5. EMU Urban Rail + Regional Rail to Key Stations

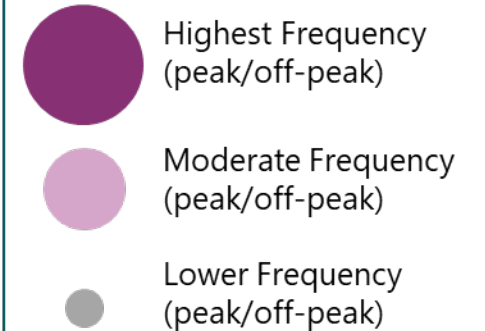


## 6. Electrified/Integrated



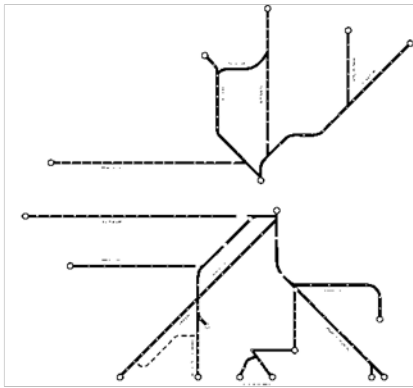
*All frequencies are  
**bi-directional***

### Legend



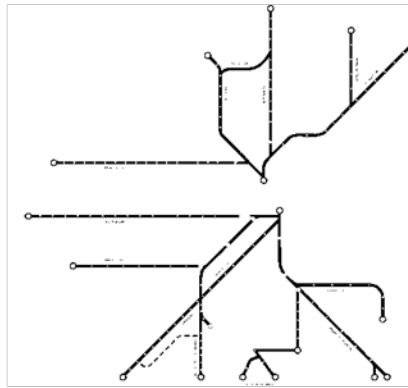
# How the Alternatives Address...Electrification

## 1. Modernize Existing System



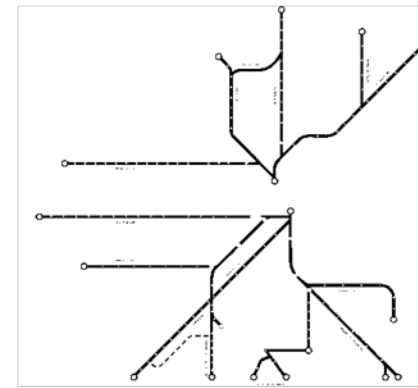
None

## 2. Regional Rail to Key Stations



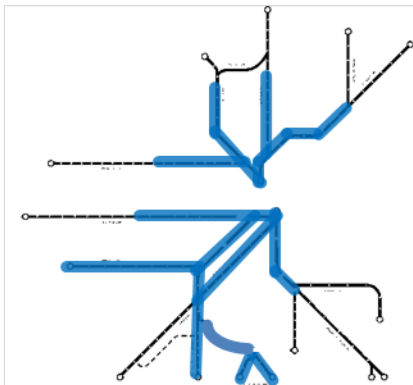
None

## 3. DMU Urban Rail



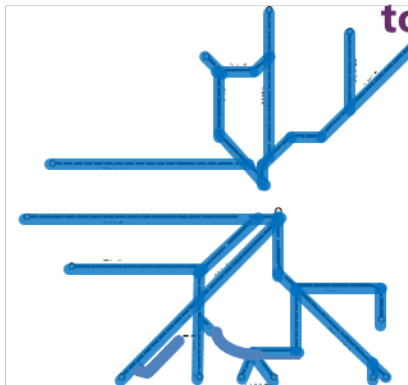
None

## 4. EMU Urban Rail



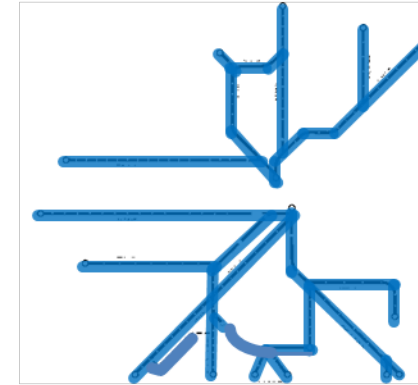
Partial

## 5. EMU Urban Rail + Regional Rail to Key Stations



Full

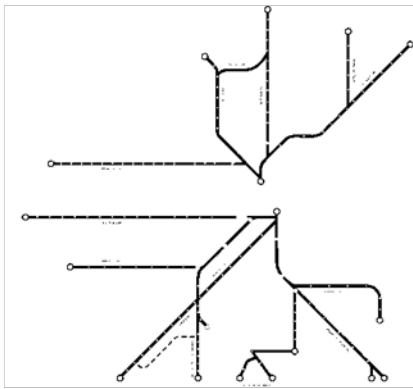
## 6. Electrified/Integrated



Full

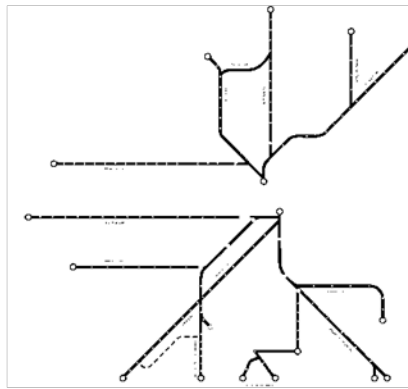
# How the Alternatives Address...Terminal Capacity

## 1. Modernize Existing System



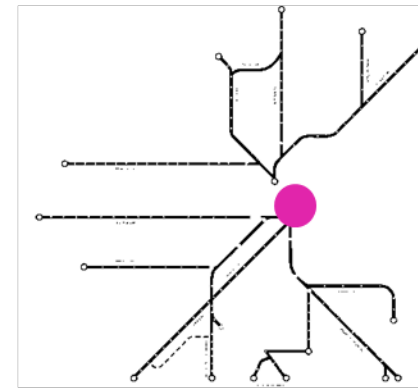
Existing

## 2. Regional Rail to Key Stations



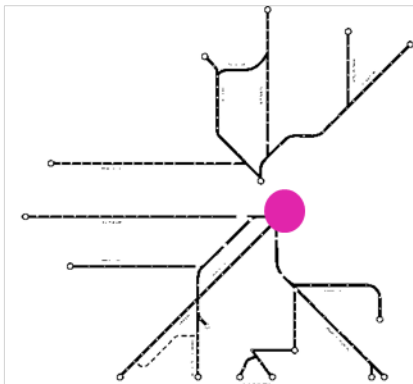
Existing

## 3. DMU Urban Rail



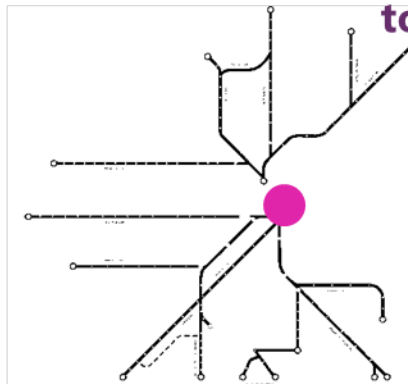
South Station Expansion

## 4. EMU Urban Rail



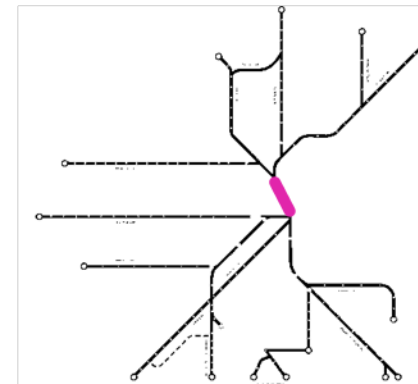
South Station Expansion

## 5. EMU Urban Rail + Regional Rail to Key Stations



South Station Expansion

## 6. Electrified/Integrated

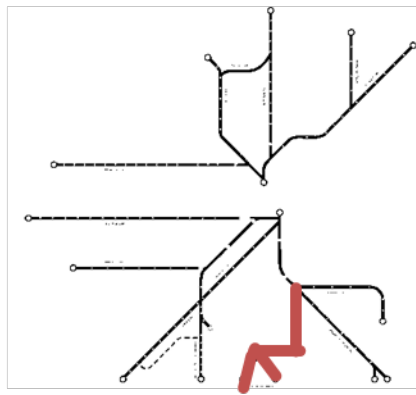


North-South Rail Link



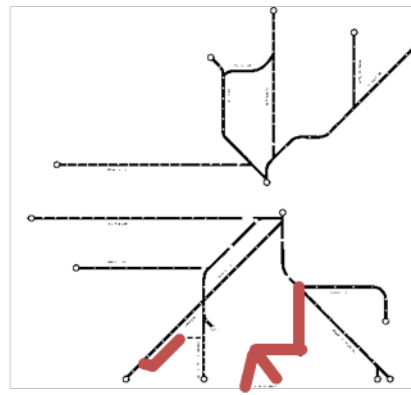
# How the Alternatives Address...System Expansion

## 1. Modernize Existing System



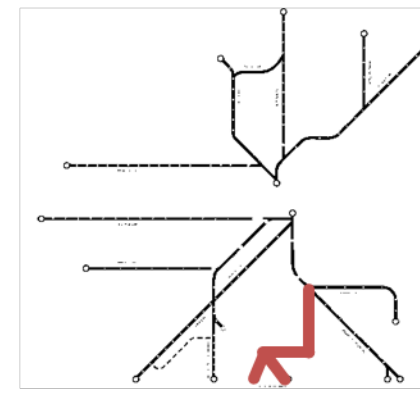
SCR Phase 1

## 2. Regional Rail to Key Stations



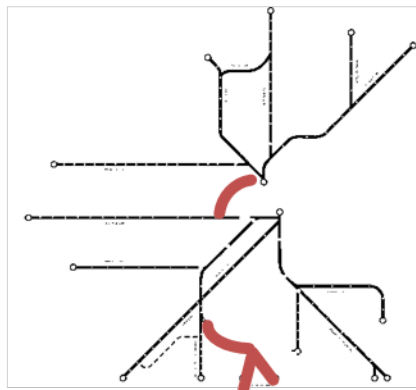
SCR Phase 1  
Foxboro

## 3. DMU Urban Rail



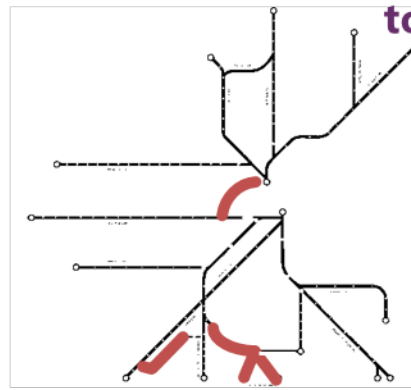
SCR Phase 1

## 4. EMU Urban Rail



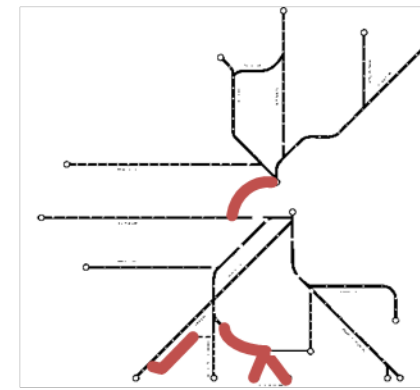
SCR Full Build  
Grand Junction

## 5. EMU Urban Rail + Regional Rail to Key Stations



SCR Full Build  
Grand Junction  
Foxboro

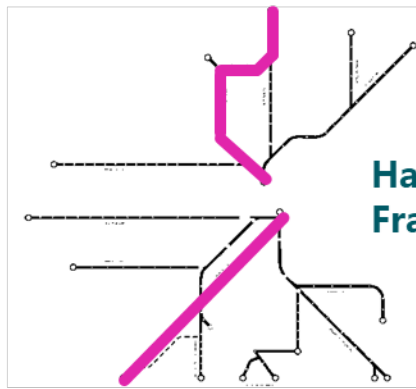
## 6. Electrified/Integrated



SCR Full Build  
Grand Junction  
Foxboro

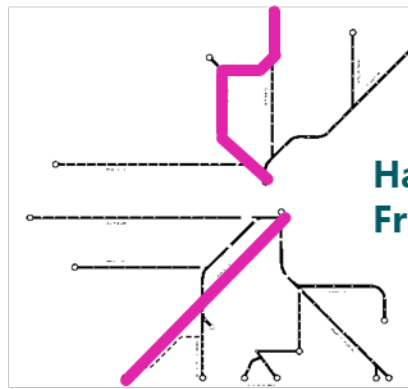
# How the Alternatives Address...Interlining

## 1. Modernize Existing System



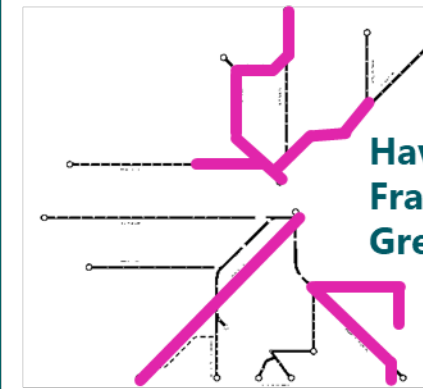
Haverhill/Lowell  
Franklin/Fairmount

## 2. Regional Rail to Key Stations



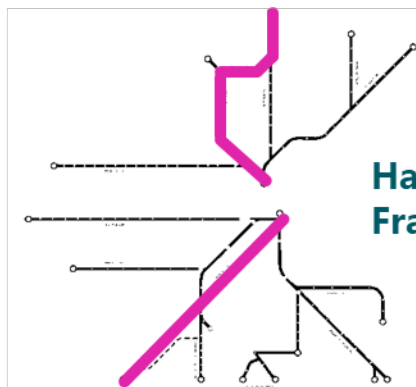
Haverhill/Lowell  
Franklin/Fairmount

## 3. DMU Urban Rail



Haverhill/Lowell  
Franklin/Fairmount  
Greenbush/Kingston  
Fitchburg/  
Newburyport-  
Rockport

## 4. EMU Urban Rail



Haverhill/Lowell  
Franklin/Fairmount

## 5. EMU Urban Rail + Regional Rail to Key Stations



Haverhill/Lowell  
Franklin/Fairmount  
Greenbush/Kingston  
Fitchburg/  
Newburyport-  
Rockport

## 6. Electrified/Integrated



Haverhill/Lowell  
Franklin/Fairmount

# How the Alternatives Address...Station Accessibility

## 1. Modernize Existing System

Key Stations

Inner Core

Other

## 2. Regional Rail to Key Stations

Key Stations



Inner Core

Other

## 3. DMU Urban Rail

Key Stations

Inner Core



Other

## 4. EMU Urban Rail

Key Stations

Inner Core



Other

## 5. EMU Urban Rail + Regional Rail to Key Stations

Key Stations



Inner Core



Other

## 6. Electrified/Integrated

Key Stations



Inner Core



Other

### Legend



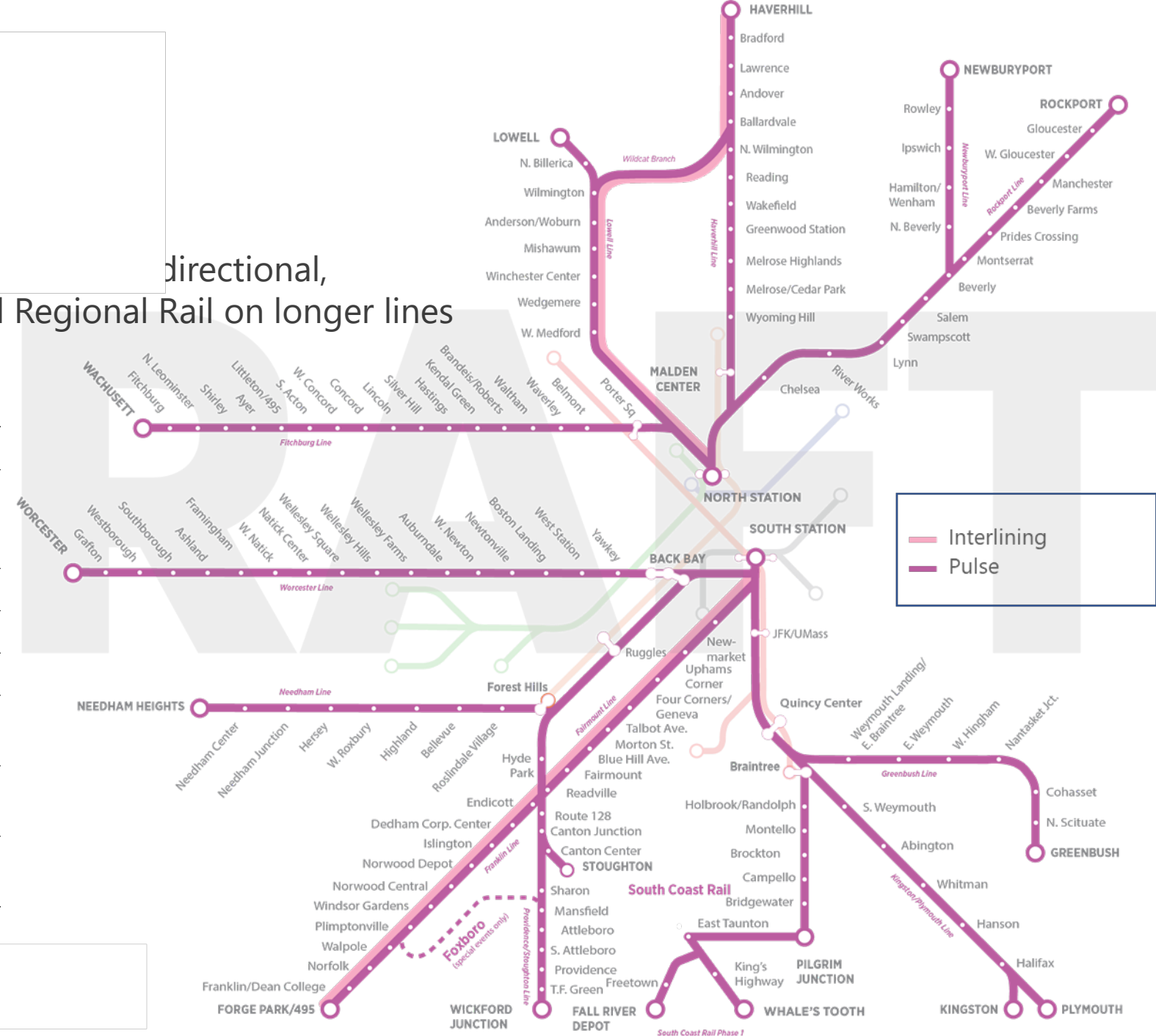
Stations Prioritized for Accessibility Upgrades

*Accessibility upgrades would be done to be consistent with PATI program prioritization.*

# Service Alternative #1: Modernize

Maximizes functionality, directional, predictable, consistent pulse service and Regional Rail on longer lines

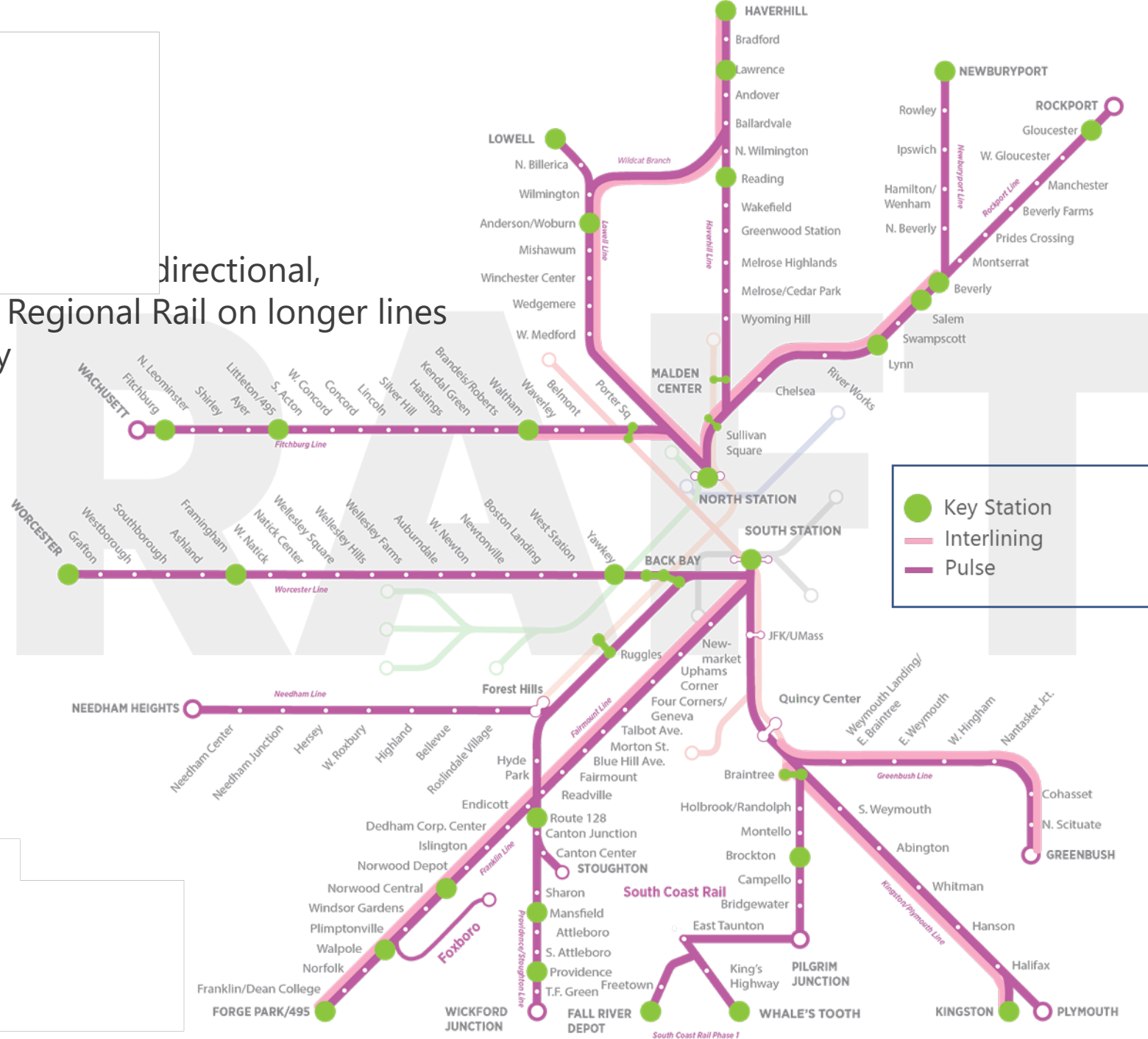
Key Features	
Typical Frequency	Key Stations: 30/60 bi-directional Inner Core: 30/60 bi-directional Other Stations: 30/60 bi-directional
Electrification	None
Rolling Stock	Diesel Locomotive
Terminals	Existing
System Expansions	SCR Phase 1
Interlining	Haverhill/Lowell Franklin/Fairmount
Station Accessibility	Existing or Programmed



## Service Alternative #2: Regional Ra

Maximizes functional, directional, predictable, consistent pulse service and Regional Rail on longer lines and capacity to support added frequency

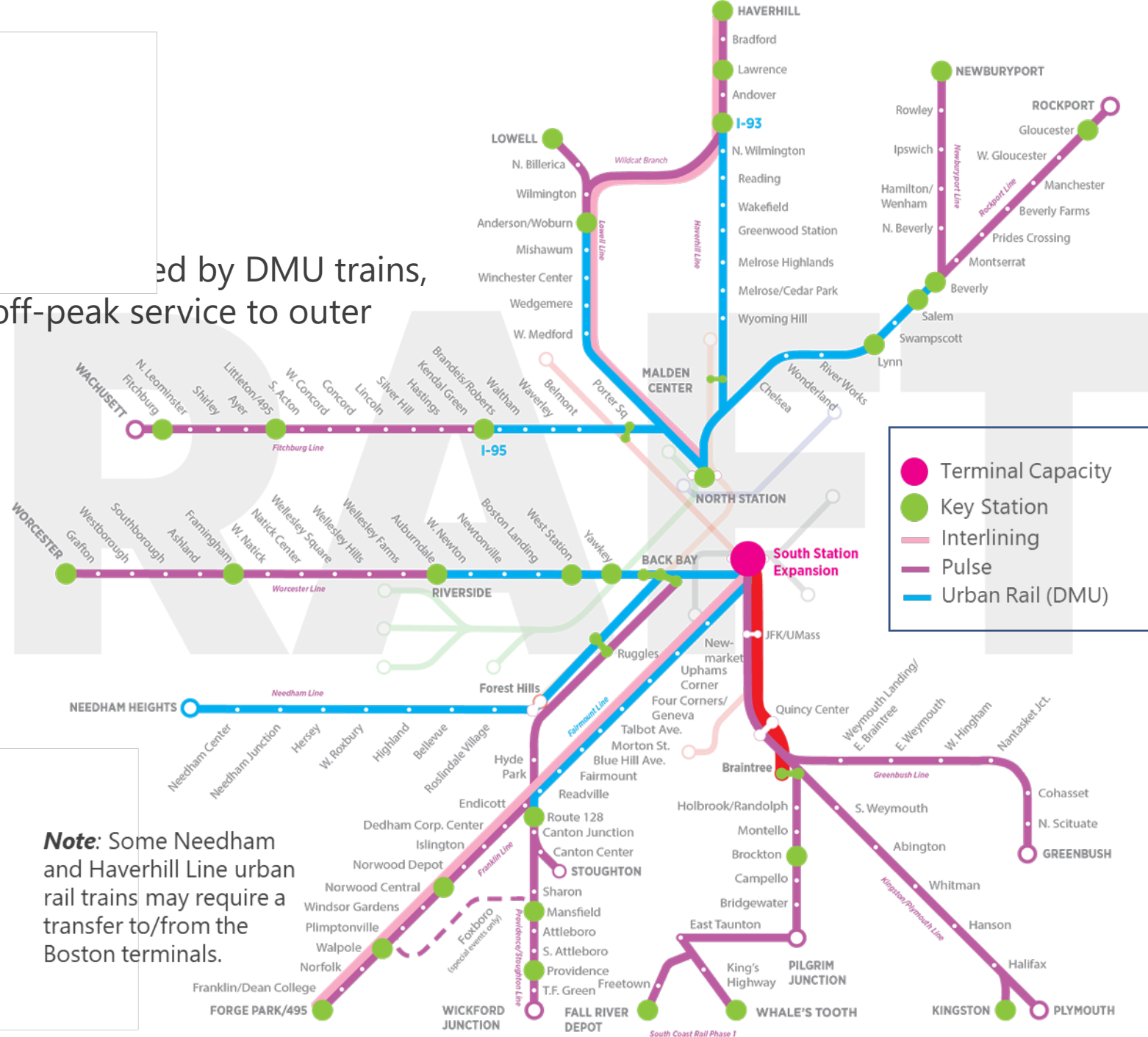
Key Features	
Typical Frequency	Key Stations: 15/15 bi-directional Inner Core: 30/60 bi-directional Other Stations: 30/60 bi-directional
Electrification	None
Rolling Stock	Diesel Locomotive
Terminals	Existing
System Expansions	SCR Phase 1 Foxboro
Interlining	Haverhill/Lowell Franklin/Fairmount Greenbush/Ki Fitchburg/Ne
Station Accessibility	Key Static



# Service Alternative #3: DMU Urban

All-day frequent service supported by frequent peak and hourly off-peak service to outer stations, with South Station Expansion

Key Features	
Typical Frequency	Key Stations: 30/60 bi-directional Inner Core: 15/15 bi-directional Other Stations: 30/60 bi-directional
Electrification	None
Rolling Stock	DMUs Diesel Locomotive
Terminals	South Station Expansion
System Expansions	SCR Phase 1
Interlining	Haverhill, Franklin/I
Station Accessibility	Inner Cor

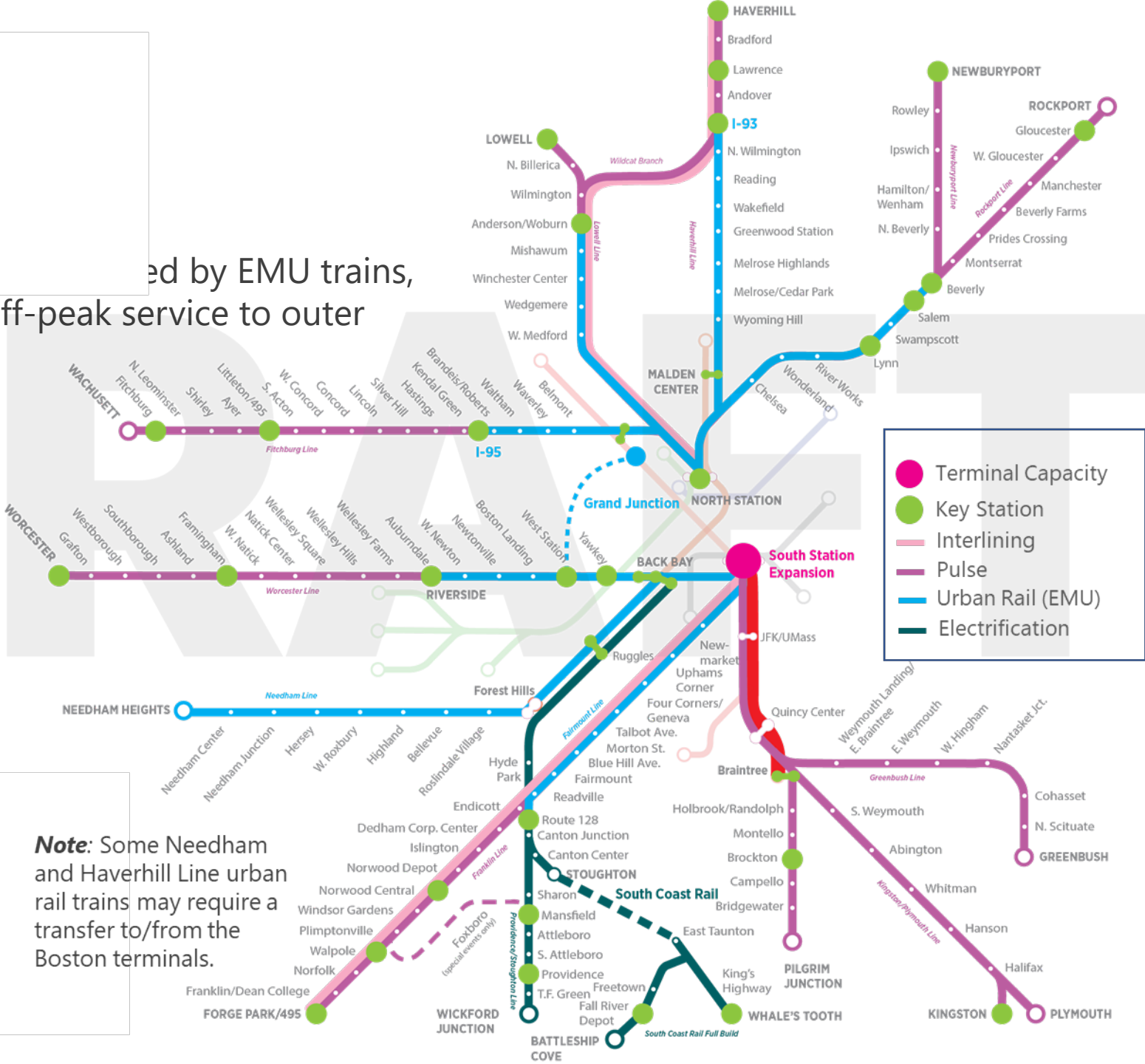




# Service Alternative #4: EMU Urban

All-day frequent service supported by frequent peak and hourly off-peak service to outer stations, with South Station Expansion

Key Features	
Typical Frequency	Key Stations: 30/60 bi-directional Inner Core: 15/15 bi-directional Other Stations: 30/60 bi-directional
Electrification	Urban Rail Providence Line SCR Full Build
Rolling Stock	EMUs Diesel Locomotive
Terminals	South Station Expansion
System Expansions	SCR Full I Grand Ju
Interlining	Haverhill, Franklin/I
Station Accessibility	Inner Cor



**Note:** Some Needham and Haverhill Line urban rail trains may require a transfer to/from the Boston terminals.

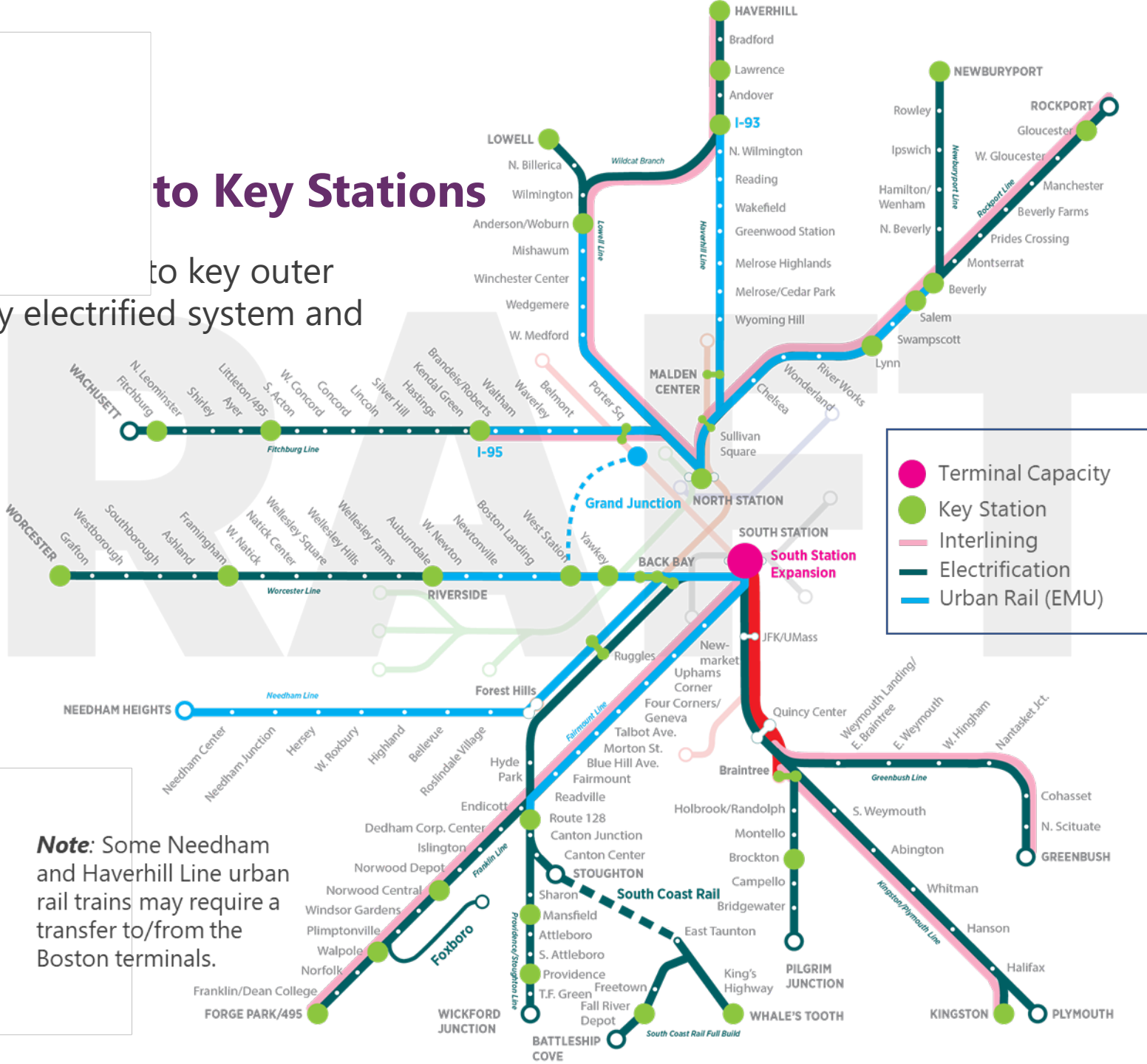


# Service Alternative #5: Fitchburg to Boston

All-day frequent service to key outer stations, served by EMU trains, with a fully electrified system and South Station Expansion

Key Features	
Typical Frequency	Key Stations: 15/15 bi-directional Inner Core: 15/15 bi-directional Other Stations: 30/60 bi-directional
Electrification	Full System
Rolling Stock	EMUs
Terminals	South Station Expansion
System Expansions	SCR Full Build Grand Junction Foxboro
Interlining	Haverhill/ Franklin/ Greenbus Fitchburg
Station Accessibility	Key Station Inner Core

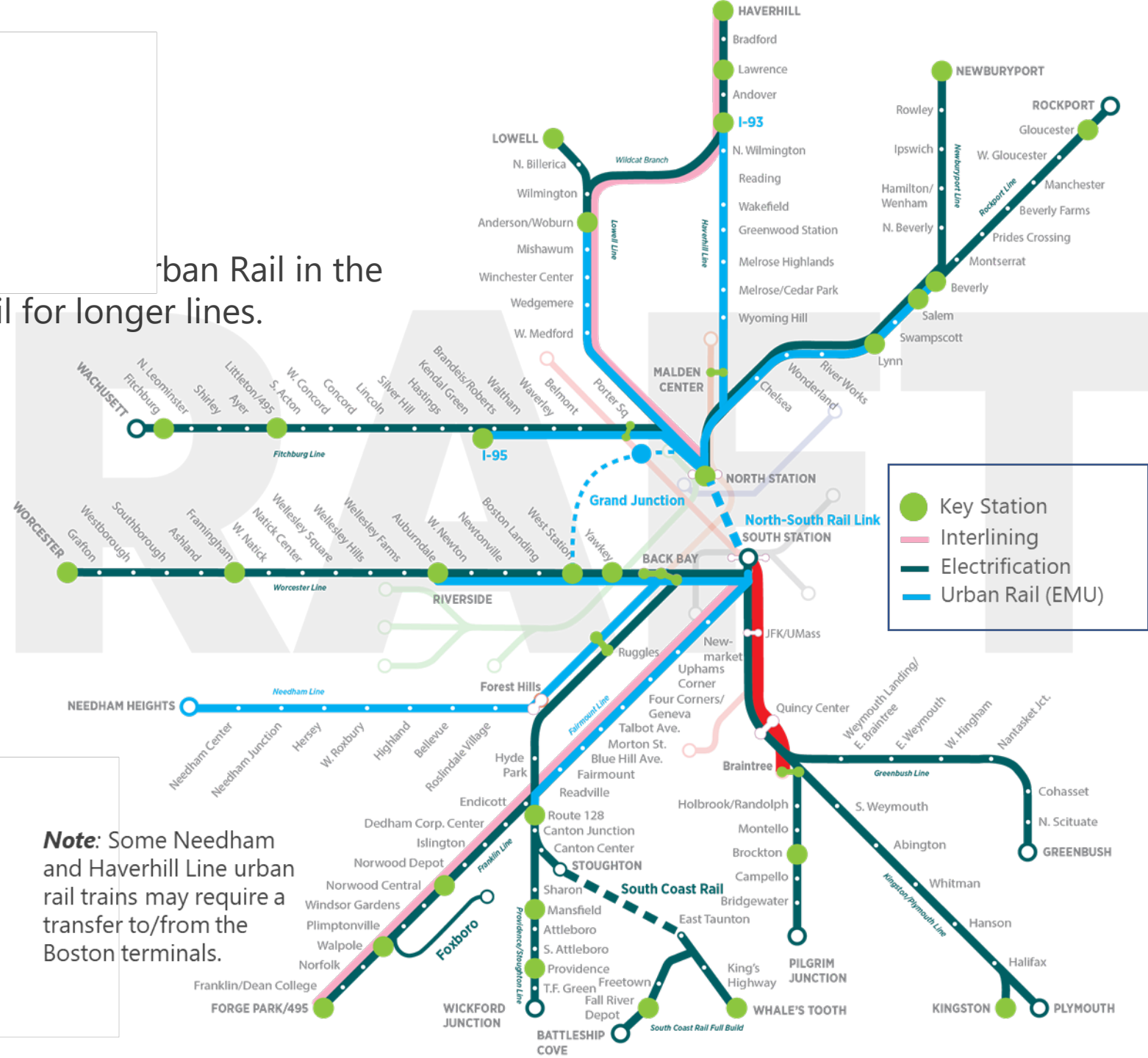
## to Key Stations



# Service Alternative #6: Electrified/Urban Rail

Full system electrification for inner core communities and Regional Rail for longer lines.

Key Features	
Typical Frequency	Key Stations: 15/15 bi-directional Inner Core: 15/15 bi-directional Other Stations: 15/30 bi-directional
Electrification	Full System
Rolling Stock	EMUs
Terminals	North-South Rail Link
System Expansions	SCR Full Build Grand Junction Foxboro
Interlining	Haverhill/Lowell Franklin/Fairmount Urban Rail/Urban
Station Accessibility	All Stations Se



# Summary of Proposed Service Alternatives for Tier 2

	Non-Electrified Alternatives			Electrified Alternatives		
Alternative	<i>1. Modernize Existing System</i>	<i>2. Regional Rail to Key Stations</i>	<i>3. DMU Urban Rail</i>	<i>4. EMU Urban Rail</i>	<i>5. EMU Urban Rail + Regional Rail to Key Stations</i>	<i>6. Electrified/Integrated</i>
Investment Level	Lowest ----- Highest					
<b>Typical Frequency (peak/off-peak)</b>	30/60 Key Stations 30/60 Inner Core 30/60 Other	15/15 Key Stations 30/60 Inner Core 30/60 Other	30/60 Key Stations 15/15 Inner Core 30/60 Other	30/60 Key Stations 15/15 Inner Core 30/60 Other	15/15 Key Stations 15/15 Inner Core 30/60 Other	15/15 Key Stations 15/15 Inner Core 15/30 Other
<b>Electrification</b>	None	None	None	Partial System - Urban Rail - Providence Line - SCR Full Build	Full System	Full System
<b>Rolling Stock</b>	Diesel Locomotive	Diesel Locomotive	DMUs Diesel Locomotive	EMUs Diesel Locomotive	EMUs	EMUs
<b>Terminals</b>	Existing	Existing	SSX	SSX	SSX	NSRL
<b>System Expansion</b>	SCR Phase 1	SCR Phase 1 Foxboro	SCR Phase 1	SCR Full Build Grand Junction	SCR Full Build Grand Junction Foxboro	SCR Full Build Grand Junction Foxboro
<b>Interlining</b>	Haverhill/Lowell Franklin/Fairmount	Haverhill/Lowell Franklin/Fairmount Greenbush/Kingston Fitchburg/ Newburyport-Rockport	Haverhill/Lowell Franklin/Fairmount	Haverhill/Lowell Franklin/Fairmount	Haverhill/Lowell Franklin/Fairmount Greenbush/Kingston Fitchburg/ Newburyport-Rockport	Haverhill/Lowell Franklin/Fairmount Urban Rail/Urban Rail
<b>Station Accessibility</b>	Existing or Programmed	Key Stations	Inner Core	Inner Core	Key Stations Inner Core	All Stations

# Glossary of Terms

Term	What We Learned
Bi-Directional	<ul style="list-style-type: none"><li>Services serve both inbound to Boston and outbound to regions in a similar pattern (could be useful to support reverse commute opportunities).</li></ul>
Electrification	<ul style="list-style-type: none"><li>Converting track sections and upgrading the train fleet so that service is powered by electricity, and not by diesel locomotive. This can be done systemwide, for individual rail lines, or for a portion of a rail line.</li></ul>
Inner Core Station	<ul style="list-style-type: none"><li>Stations in densely populated areas around Boston (typically within Route 128) that are prioritized under Urban Rail alternatives.</li></ul>
Interlining	<ul style="list-style-type: none"><li>Lines or track sections that are shared by more than one rail line or branch, to increase capacity by rerouting away from downtown terminals or create new connections between lines.</li></ul>
Key Station	<ul style="list-style-type: none"><li>Station which, for reasons of demand, current ridership, connections, or other reasons, is expected to receive higher levels of service than other stations in the system.</li></ul>
Pulse	<ul style="list-style-type: none"><li>Frequent, predictable service (such as bi-hourly, quarterly), with trains moving in both directions at equal frequency. This would present a more set schedule and, in some cases, a substantial increase in frequency.</li></ul>
Terminal	<ul style="list-style-type: none"><li>The end point of a rail line. In the context of this presentation, “terminal” refers to the shared end points of all rail lines in downtown Boston.</li></ul>