



# RAIL VISION

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## Advisory Committee Meeting

NOVEMBER 14, 2018

## Presentation Agenda

1. Welcome
2. Tier 1 Evaluation Results
  - North Side Lines
  - South Side Lines
3. Next Steps



# Tier 1 Evaluation Results

# Considerations Held

- Freight and non-revenue train moves
- Specific signal upgrades and maintenance and layover needs
- Terminal capacity needs
- On-time performance
- How concepts work as a system



# Tier 1 Key Performance Metrics



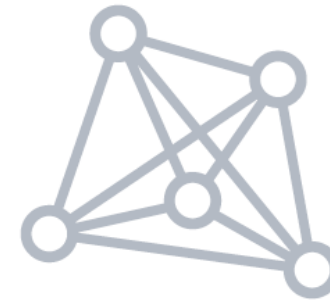
## Travel Time Savings

*Average in-vehicle travel time savings*



## Frequency

*Total number of trains serving the line per day*



## Connectivity

*Percentage change of jobs accessible within one hour of travel as a result of service concept*



## Equity

*How benefits to Environmental Justice communities under the service concept compare to benefits to non-EJ communities*



## Ridership on Line

*Percentage change in ridership along the line under the service concept*



## Capital Costs

*Order of magnitude comparison of major capital cost elements for service concept*



## Operating Costs

*Order of magnitude comparison of incremental annual operating costs for service concept*

## Why These Key Metrics?

- The Key Metrics are readily available **outputs** from our Tier 1 models that match our project objectives
- They are **not a one-for-one match** – some metrics meet more than one objective

### Project Objective

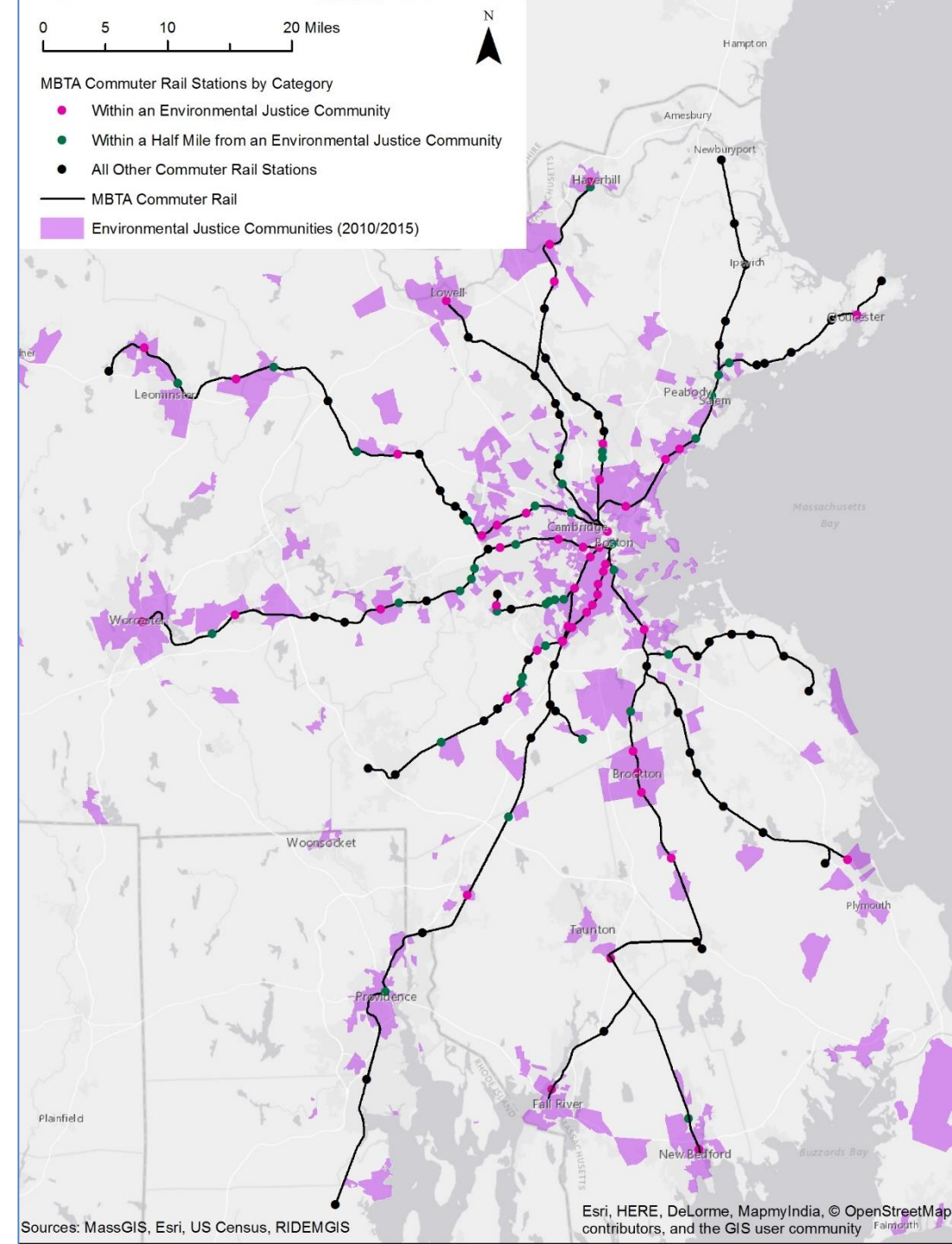
1. Match service with the growing and changing needs of the region
2. Enhance economic vitality
3. Improve the passenger experience
4. Provide an equitable and balanced suite of investments
5. Help the Commonwealth achieve its climate change sustainability targets
6. Maximize return on investment (financial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

### Tier 1 Metric

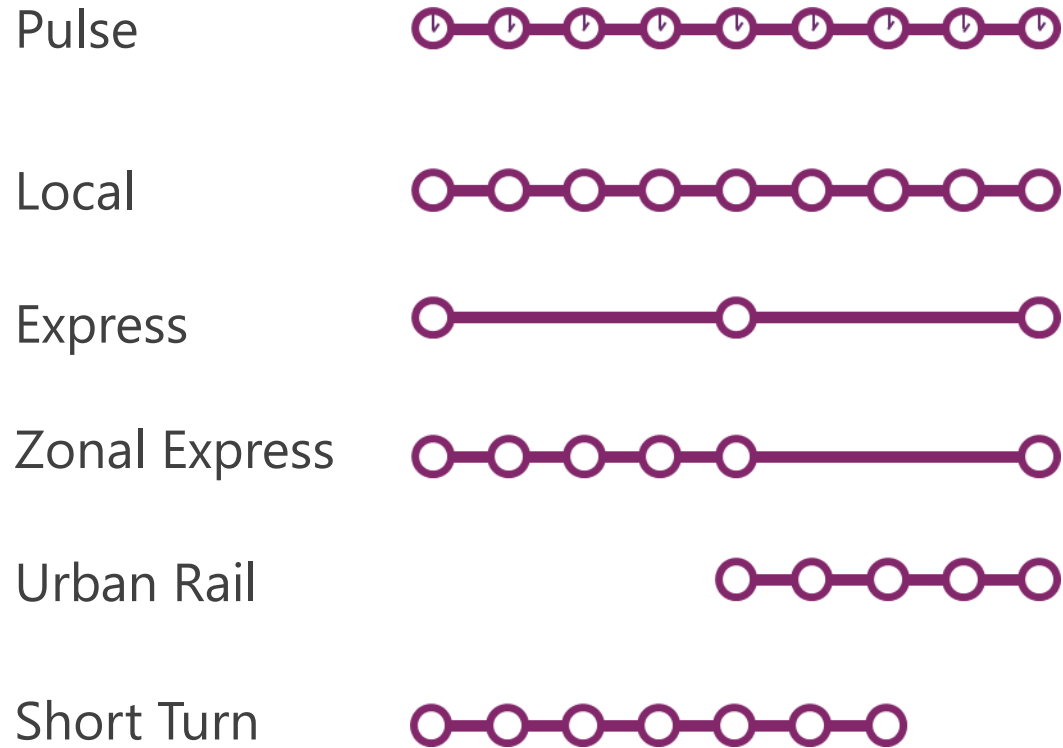
- Ridership and Connectivity
- Connectivity
- Travel Time Savings and Frequency
- Equity
- Ridership
- Capital Costs and Operating Costs

# Environmental Justice Communities

- Defined in Massachusetts as:
  - Annual median household income is equal to or less than 65 percent of the statewide median;
  - 25 percent or more of the residents identify as a race other than white; or
  - 25 percent or more of households have no one over the age of 14 who speaks English only or very well (English Isolation).
- Defined separately for Rhode Island



# Service Terms Used



Skip Stop



Interlining



Transfer Types

Forced Transfer



Local/Express Transfer





## Some Takeaways from the Tier 1 Effort

Theme	What We Learned
Phasing	<ul style="list-style-type: none"> <li>• A pulse system alone adds tremendous value!</li> <li>• Some concepts (some lines) could be implemented in the short-term</li> </ul>
Technology	<ul style="list-style-type: none"> <li>• For some longer distance lines, Zonal Express (outer) + Urban Rail (inner) works well</li> <li>• Electrification – real benefits, real cost</li> </ul>
Different Lines, Different Needs?	<ul style="list-style-type: none"> <li>• A ‘one size fits all’ approach may not be the most effective</li> <li>• Some lines need more investment than others to realize benefits</li> </ul>
Needs at the Terminals	<ul style="list-style-type: none"> <li>• Interlining brings real efficiency – but some lines are easier to interline than others</li> <li>• Frequency investments on all lines put a cumulative pressure on North and South Station</li> </ul>
Cost	<ul style="list-style-type: none"> <li>• Investment brings new riders! Capital funding needs could be high, and operating costs remain larger than revenues</li> </ul>



# North Side

# North Side Lines

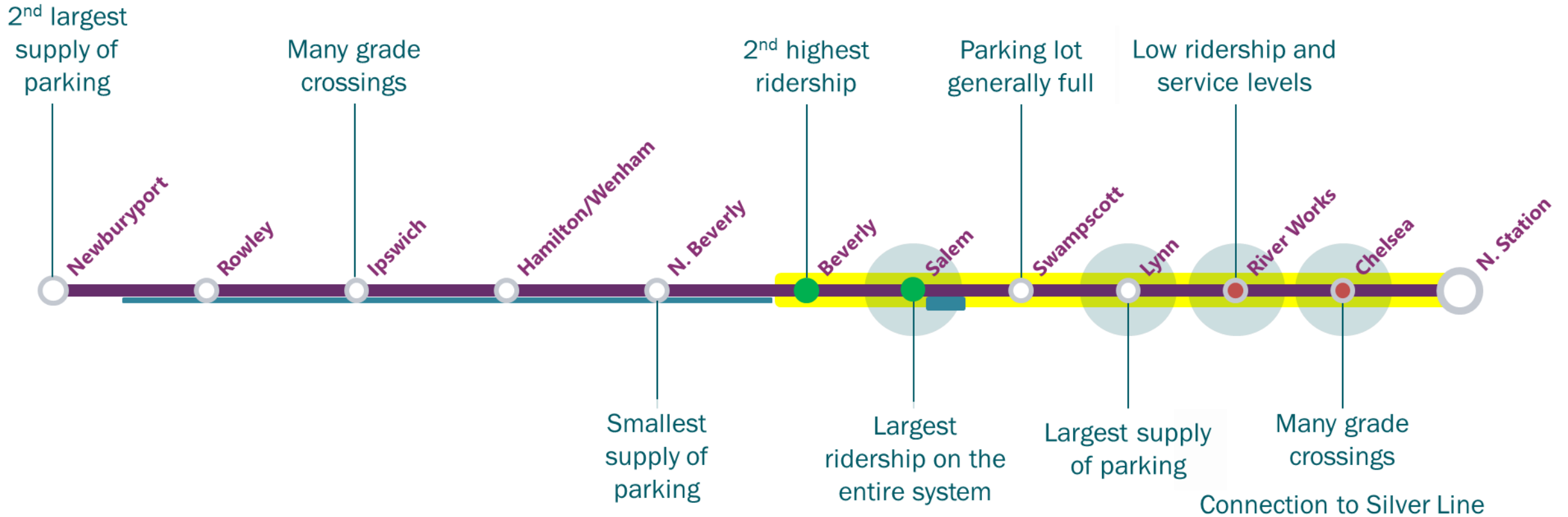


# Newburyport/Rockport Line



# Newburyport Line Existing Conditions

- Capacity constraints on this line include single track sections, Salem tunnel, and many grade crossings in Ipswich and Chelsea



Gateway Cities    
  Station in the Top 10 Highest Ridership Systemwide    
  Single Track Section  
 Station Not Accessible – Low Level Platforms    
 Shared section – Rockport Line

# Rockport Line Existing Conditions

- Capacity constraints on this line include single track sections, Lynn tunnel, drawbridges, grade crossings in Chelsea, and station constraints

2<sup>nd</sup> largest parking supply

Station size constrained

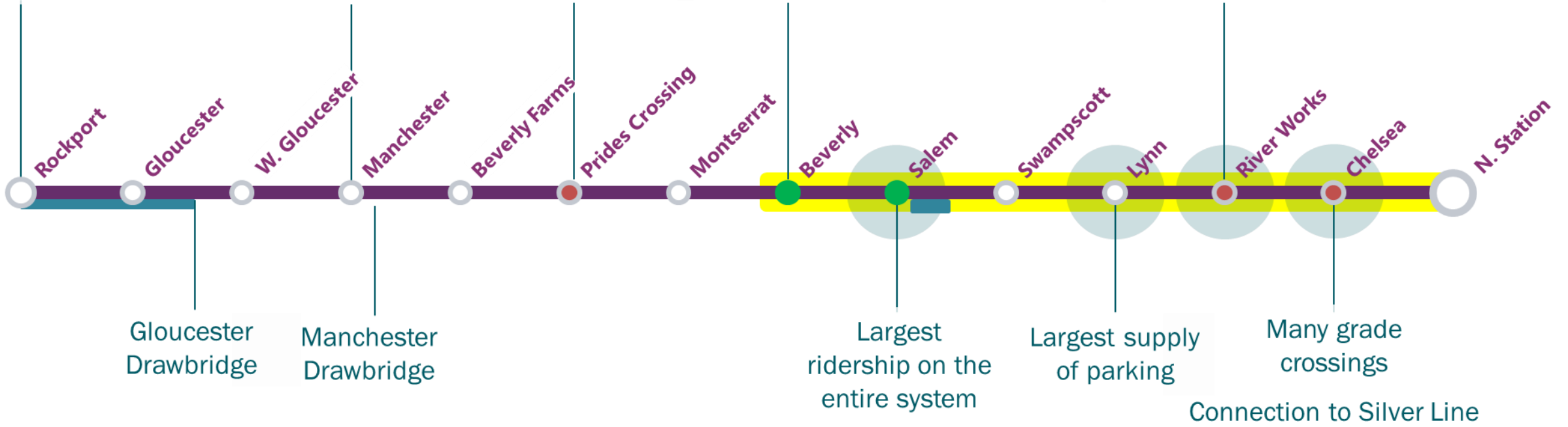
Station proximate to core and beach

Low ridership and service levels

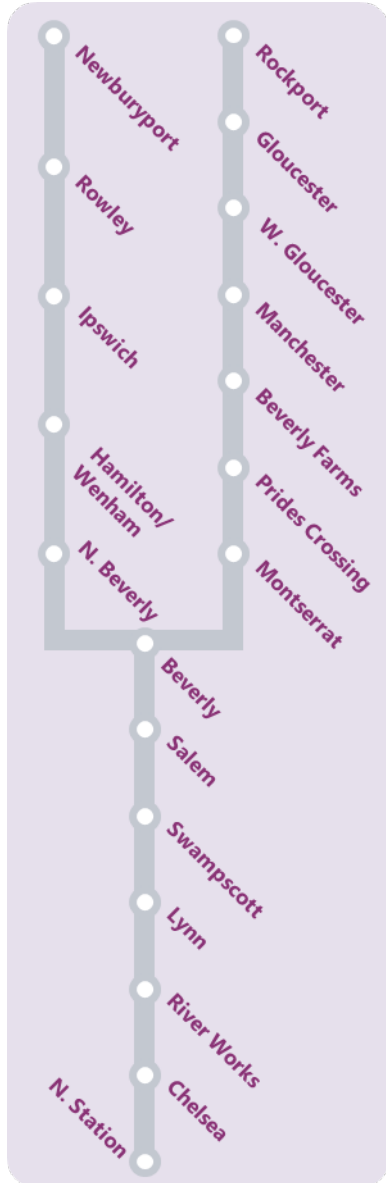
2<sup>nd</sup> highest ridership

Parking lot generally full

Low ridership and service levels



# Newburyport/Rockport Line Concept Matrix



ID	CONCEPT	PEAK TRAINS/HOUR	NOTES
0	No Build	Trunk Stations: 2-4 Branch Stations: 1-2	<ul style="list-style-type: none"> <li>Irregular stopping patterns at some stations</li> </ul>
1	Pulse (Base)	Chelsea-Lynn: 4 Swampscott-Beverly: 6 Branch Stations: 1-2	<ul style="list-style-type: none"> <li>Logical schedules</li> <li>All branch stations have at least 1 train per hour</li> </ul>
2	Pulse with Higher Speeds	Same as Concept 1	<ul style="list-style-type: none"> <li>Same as Concept 1 but also reduces travel times by removing some speed restrictions</li> </ul>
3	Zonal Express with Forced Local Transfer	Chelsea-River Works: 2 Lynn, Salem, Beverly: 6 Swampscott: 2 Branch Stations: 2	<ul style="list-style-type: none"> <li>Pulse system with express trains for branches, frequent trunk service, and speed restrictions removed</li> <li>Requires a transfer at Salem to reach local stations within the trunk</li> </ul>
4	Electrify Line	Chelsea-Swampscott: 2 Salem, Beverly: 6 Branch Stations: 2	<ul style="list-style-type: none"> <li>Similar to Concept 3 above</li> <li>Electrifies the entire line</li> </ul>
5	Connection to Sullivan Square	Sullivan-River Works: 4 Lynn, Salem, Beverly: 6 Swampscott: 4 Branch Stations: 2	<ul style="list-style-type: none"> <li>Similar to Concept 3 but with a local service option that terminates at Sullivan Square instead of North Station</li> </ul>

# Newburyport/Rockport Line Key Performance Metrics

**Major Infrastructure**

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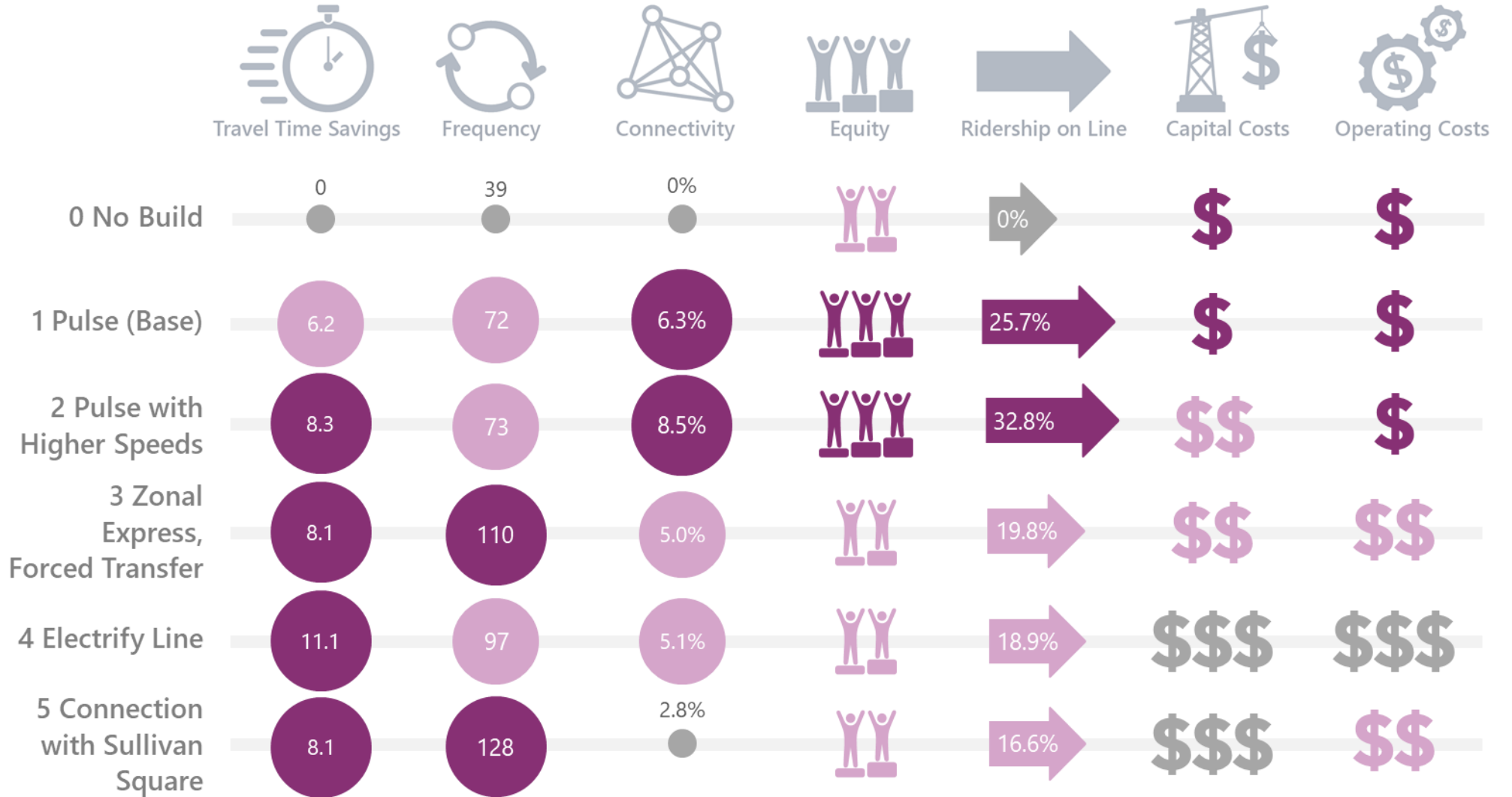
Station and track upgrades

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Above plus electrification, new vehicle fleet

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Station and track upgrades, new Sullivan Sq. station





# Haverhill/Lowell Lines



# Haverhill Line Existing Conditions

- Parallels the Orange Line North to Malden near border with Melrose.
- Large sections of single track; shared service with Amtrak (north of N. Wilmington) and Pan AM.
- Connects to the Lowell Line via the Wildcat Branch

Largest City (population and employment) on line  
2<sup>nd</sup> highest ridership on line

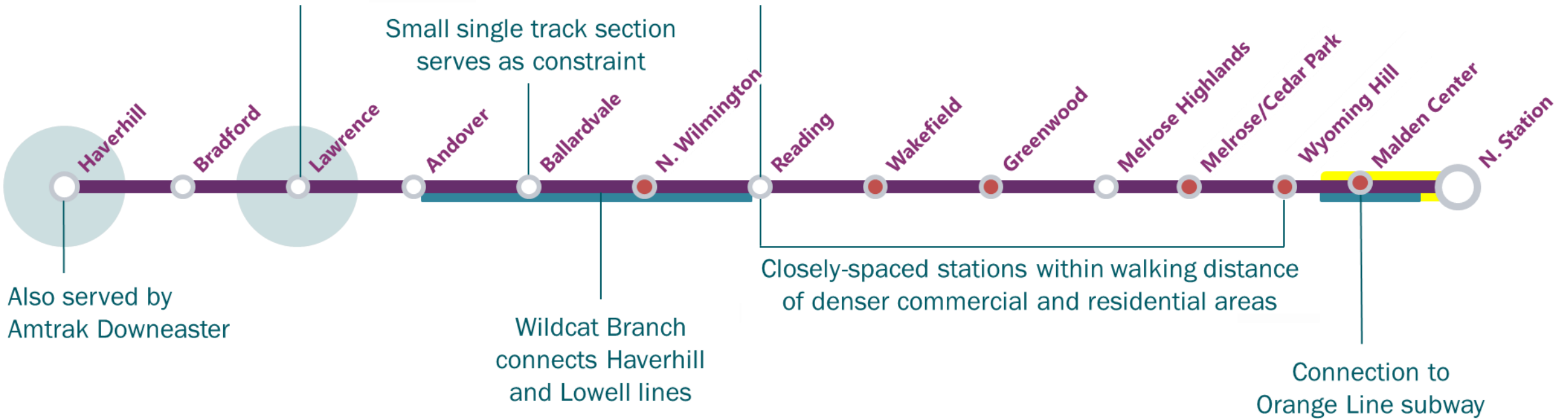
Highest ridership station on line despite small parking supply

Small single track section serves as constraint

Closely-spaced stations within walking distance of denser commercial and residential areas

Wildcat Branch connects Haverhill and Lowell lines

Connection to Orange Line subway



# Lowell Line Existing Conditions

- Entirely double-tracked line.
- Shares line with Amtrak Downeaster between North Station and Wildcat Branch north of Wilmington Station.

Lowell is the 5<sup>th</sup> largest City in Massachusetts  
 Highest ridership on line

Highest parking capacity  
 Multimodal transportation center served by regional bus and Amtrak Downeaster

Station renovation project underway



Wildcat Branch connects Haverhill and Lowell lines

Low ridership and service levels

Closely-spaced stations

Difficult grade crossing at High Street (Route 60)

Gateway Cities

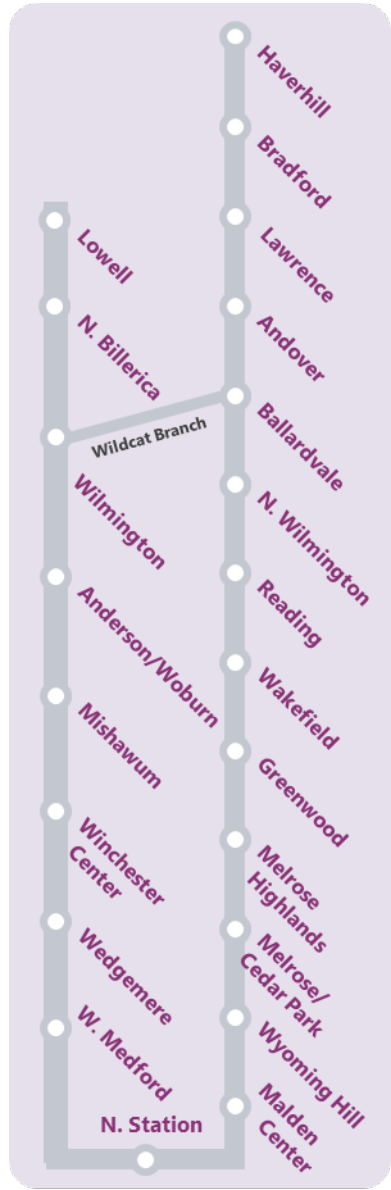
Station in the Top 10 Highest Ridership Systemwide

Station Not Accessible – Low Level Platforms

Shared section – Green Line Extension



# Haverhill/Lowell Line Concept Matrix



ID	CONCEPT	PEAK TRAINS/HOUR		NOTES
0	No Build	All <b>Haverhill Line</b> Stations: 1-2	All <b>Lowell Line</b> Stations: 2-3	
1	Pulse (Base)	Malden Center-N. Wilmington: 4 Ballardvale: 6 Andover-Bradford: 4 Haverhill: 5	W. Medford-Winchester Ctr: 2 Anderson/Woburn: 6 Wilmington-Lowell: 3	<ul style="list-style-type: none"> <li>Logical schedules</li> <li>Greater frequency</li> <li>Moderately increased use of Wildcat Branch</li> </ul>
2	Skip Stop	Malden Center-N. Wilmington: 2 Ballardvale-Bradford: 3 Haverhill: 7	W. Medford-Winchester Ctr: 2 Anderson/Woburn: 5 Wilmington, N. Billerica: 2 Lowell: 4	<ul style="list-style-type: none"> <li>Each train serves every other stop; higher frequency at Anderson and Haverhill</li> <li>Moderately increased use of Wildcat Branch</li> </ul>
3	Electrify Line	Same as Concept 1	Same as Concept 1	<ul style="list-style-type: none"> <li>Electrifies both lines</li> <li>Moderately increased use of Wildcat Branch</li> </ul>
4	Partial Haverhill Line Conversion to High-Capacity Transit (HCT) (I-93 station)	Oak Grove-I-93: HCT I-93-Bradford: 4 Haverhill: 5	W. Medford-Mishawum: 2 Anderson/Woburn: 9 Wilmington-Lowell: 4	<ul style="list-style-type: none"> <li>More frequent Haverhill and Lawrence service via Wildcat Branch, with transfers available to inner stations at new I-93 station</li> <li>Replaces inner Haverhill Line stations with HCT</li> </ul>
5	Urban Rail on Haverhill and Lowell Lines	Oak Grove-Reading: 4 I-93: 8 Ballardvale-Bradford: 4 Haverhill: 5	W. Medford-Mishawum: 4 Anderson/Woburn: 13 Wilmington-Lowell: 4	<ul style="list-style-type: none"> <li>Similar to Concept 4, but with Urban Rail serving inner Haverhill Line stations and Lowell Line stations between North Station and Anderson</li> </ul>
6	Lawrence Terminus	Malden Center-N. Wilmington: 2 Ballardvale-Lawrence: 6 Bradford: 4 Haverhill: 5	W. Medford-Mishawum: 2 Anderson/Woburn: 9 Wilmington-Lowell: 4	<ul style="list-style-type: none"> <li>All service to/from Haverhill and Bradford Stations uses Wildcat</li> <li>Service to all inner Haverhill Line stations originate at Lawrence Station</li> </ul>

# Haverhill Line Key Performance Metrics

## Major Infrastructure

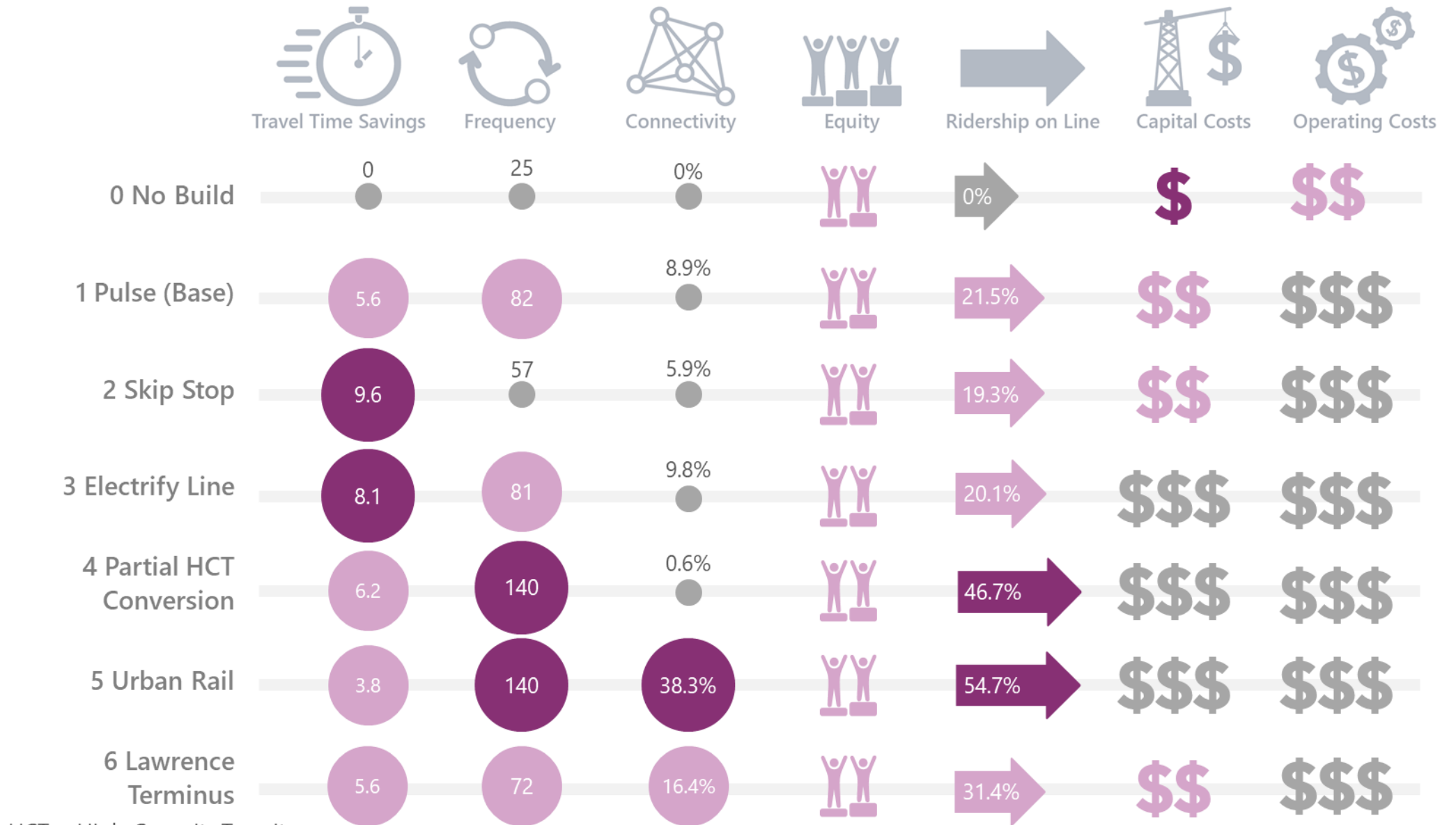
Station and track upgrades

Above plus electrification, new vehicle fleet

Costs to convert line to HCT use, double track and grade separate Wildcat

Similar to Concept 3, double track and grade separate Wildcat, new I-93 station

Station and track upgrades



HCT = High-Capacity Transit

# Lowell Line Key Performance Metrics



**Major Infrastructure**

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Station and track upgrades

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Above plus electrification, new vehicle fleet

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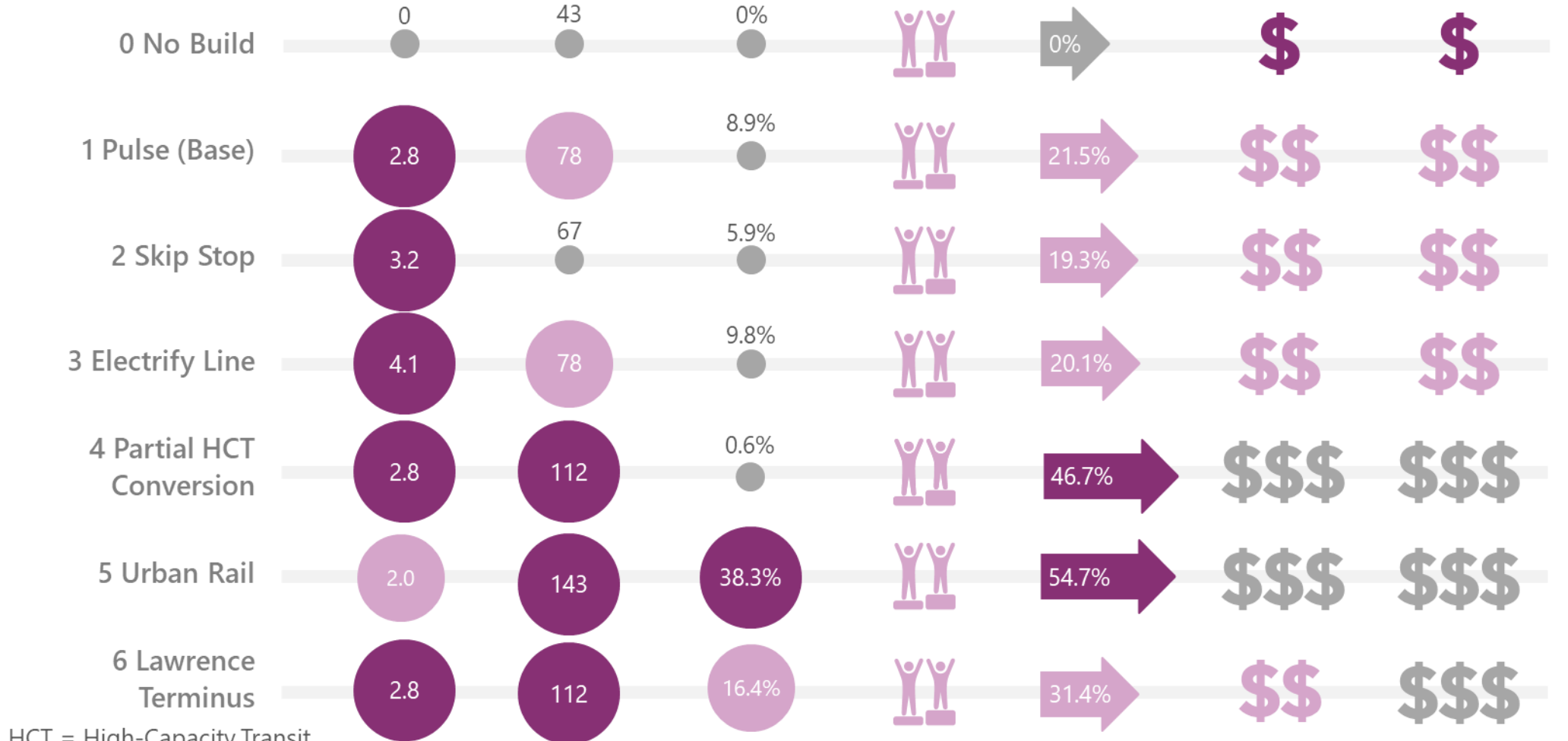
Costs to convert line to HCT use, double track and grade separate Wildcat

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Similar to Concept 3, double track and grade separate Wildcat, new I-93 station

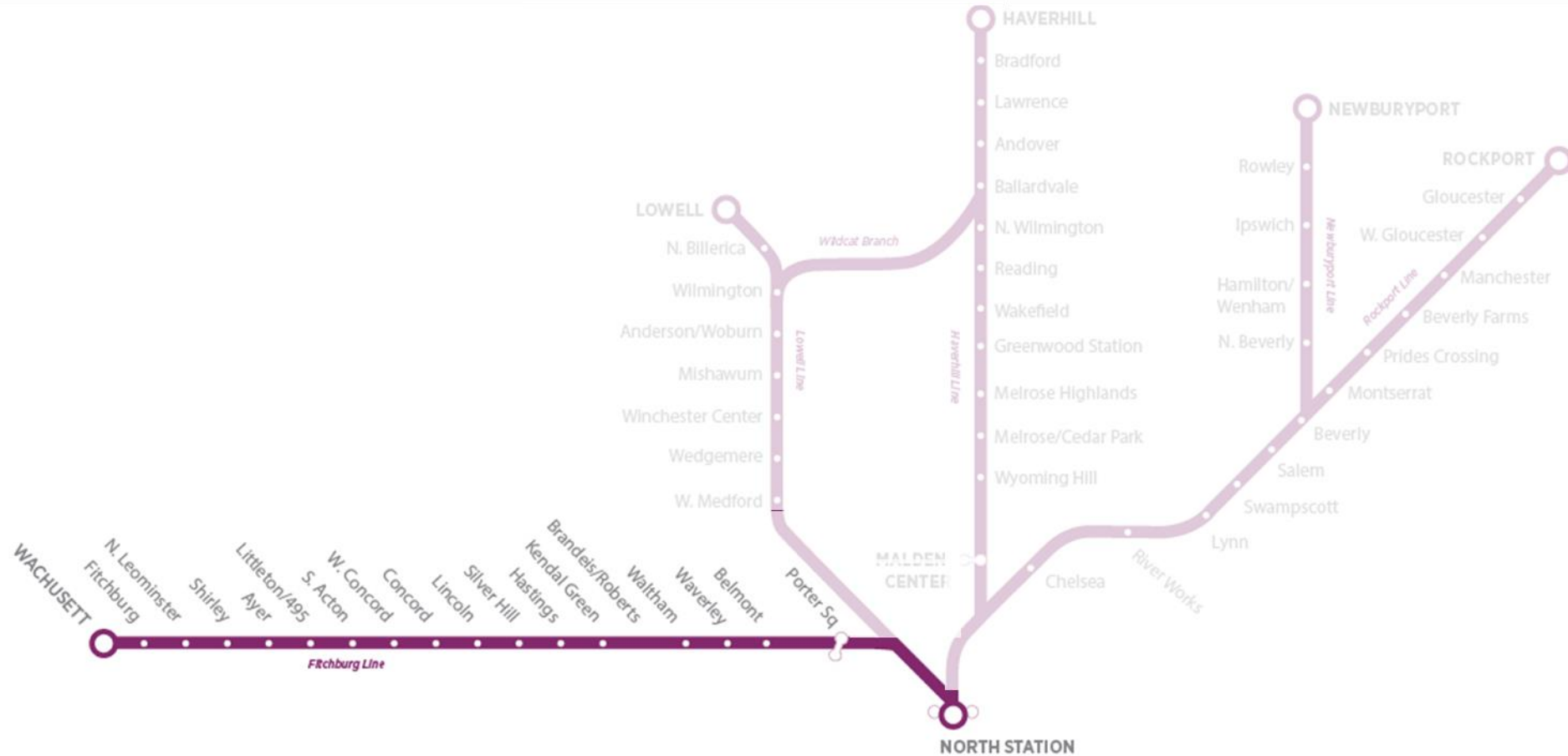
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Station and track upgrades



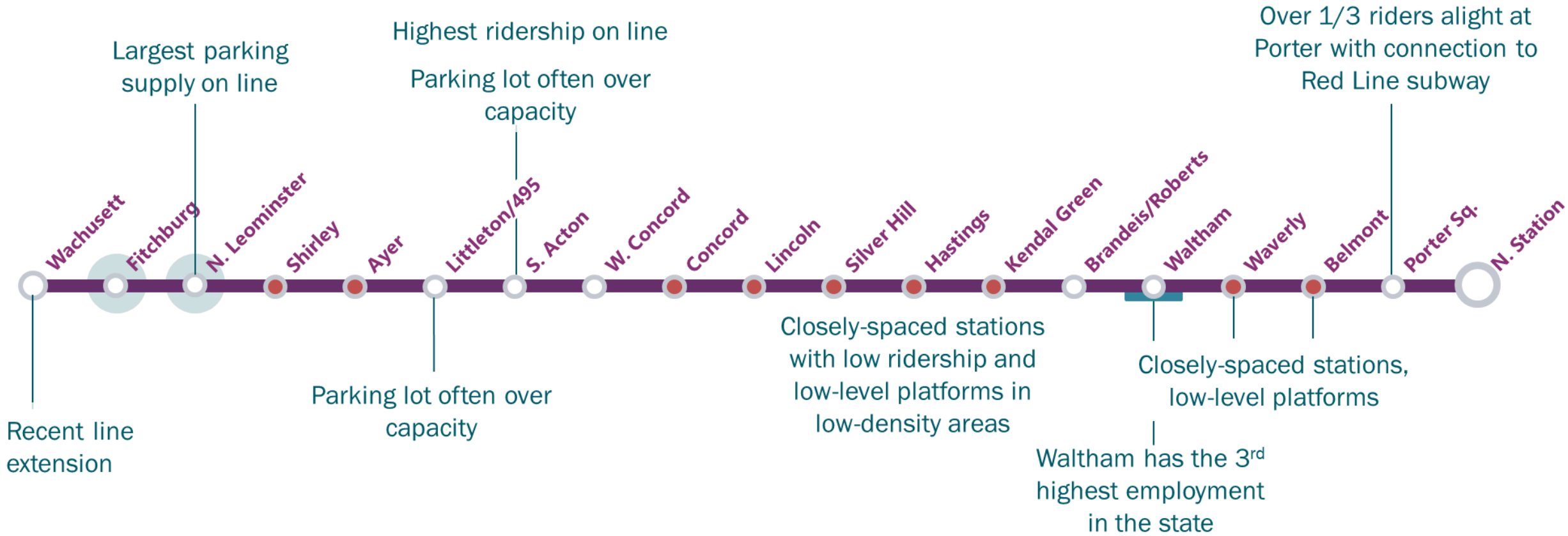
HCT = High-Capacity Transit

# Fitchburg Line



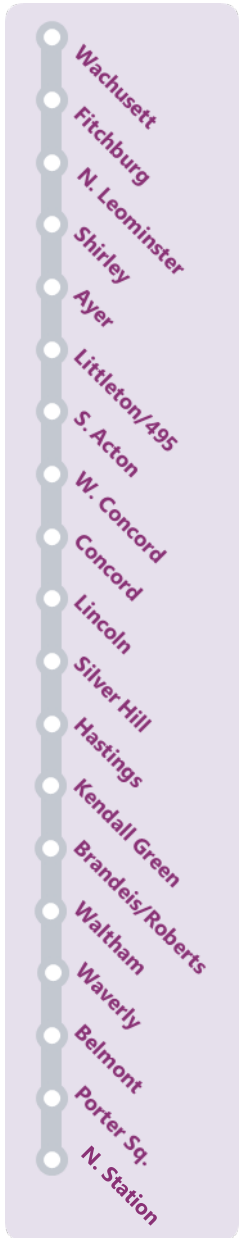
# Fitchburg Line Existing Conditions

- Second longest line in the system. Many single-side platforms.





# Fitchburg Line Concept Matrix



ID	CONCEPT	PEAK TRAINS/HOUR	NOTES
0	No Build	1-3	<ul style="list-style-type: none"> <li>Irregular stopping patterns</li> <li>Greatest frequency at Porter, S. Acton, Littleton/495</li> </ul>
1	Pulse (Base)	Porter Square, Waltham: 5 Belmont-W. Concord (All Other): 3 S. Acton, Littleton/495: 5 Ayer-Wachusett: 4	<ul style="list-style-type: none"> <li>Logical schedules</li> <li>Greater frequency</li> </ul>
2	High Frequency	Waltham, S. Acton, Littleton/495: 6 All Other: 4	<ul style="list-style-type: none"> <li>Logical schedules with greater frequency</li> <li>2 trains/hour travel between Littleton/495 and turn at Alewife, making all stops.</li> </ul>
3	Skip Stop	Porter Square: 7 Waltham, Littleton/495: 9 Wachusett, S. Acton: 6 All Other: 4	<ul style="list-style-type: none"> <li>Each train serves every other stop</li> <li>2 trains/hour travel between Littleton/495 and turn at Alewife, making all stops.</li> </ul>
4	Zonal Express	Porter Square-Waverley: 6 Waltham: 10 S. Acton: 8 All Other: 4	<ul style="list-style-type: none"> <li>Wachusett service zonal express between South Acton, Waltham, Alewife, and Boston</li> <li>Half of South Acton local trains turn at Alewife</li> <li>Local service between Waltham and Alewife</li> </ul>
5	Zonal Express with Electrification and Urban Rail	Porter Square-Brandeis/Roberts: 6 I-95 Station: 10 S. Acton, Littleton/495: 8 All Other: 4	<ul style="list-style-type: none"> <li>Similar to Concept 4</li> <li>Electrifies line to Littleton</li> <li>Urban Rail to new station near I-95 (Waltham/Weston) connecting to Alewife</li> </ul>
6	Connection with Sullivan Square	Porter Square, I-95 Station: 10 Belmont-Brandeis/Roberts: 6 S. Acton: 8 All Other: 4	<ul style="list-style-type: none"> <li>Similar to Concept 5 but adds station and connection to Orange Line at Sullivan Square</li> </ul>
7	Zonal Express with Electrification	Porter Square, I-95 Station, S. Acton, Littleton/495: 8 All Other: 4	<ul style="list-style-type: none"> <li>Similar to Concept 5 with no connection at Alewife, all trains serve Porter and North Station instead</li> <li>EMUs between Littleton and North Station</li> </ul>

# Fitchbura Line Key Performance Metrics



**Major Infrastructure**

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Station and track upgrades

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Station and track upgrades, new Alewife connection

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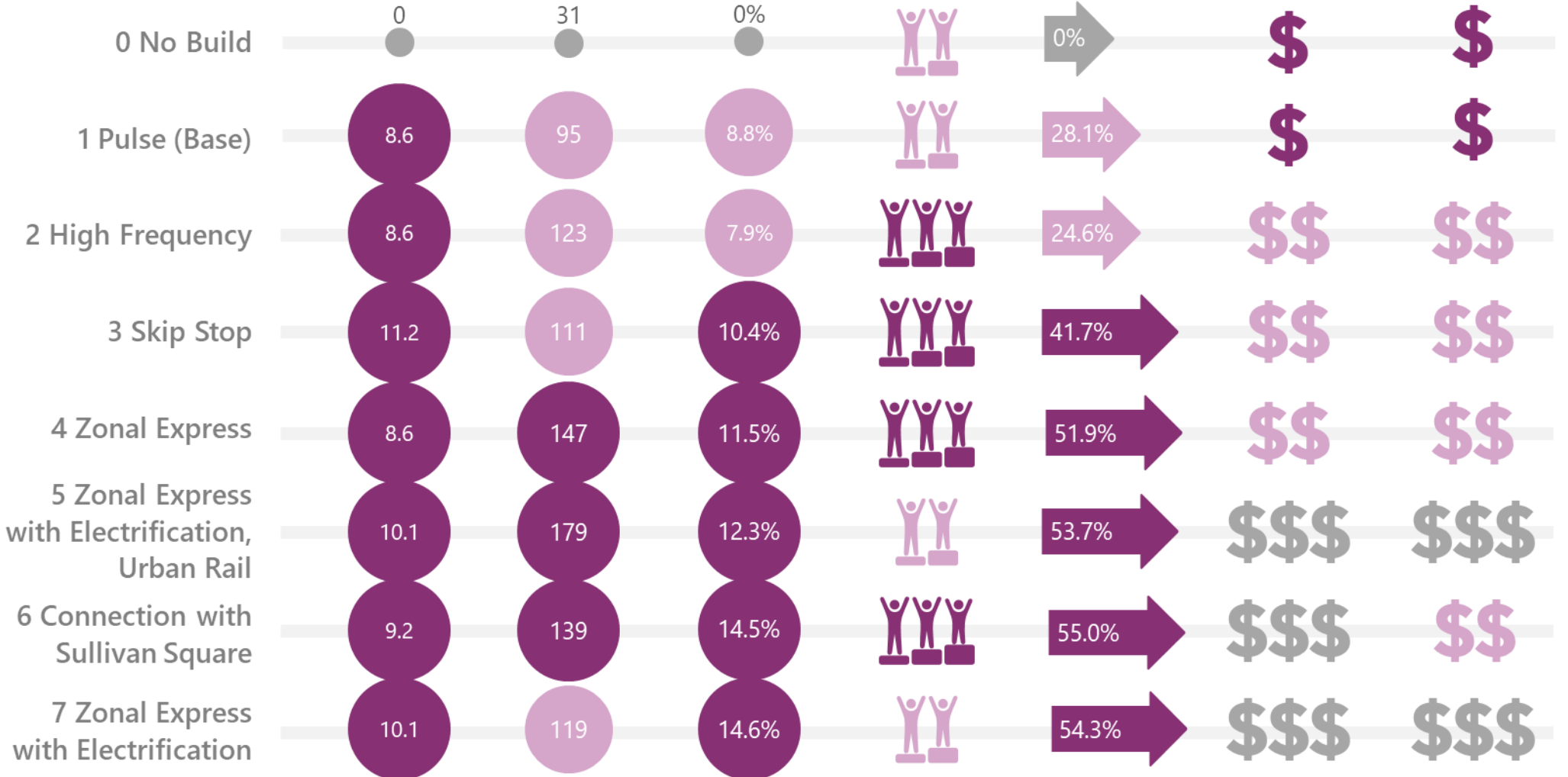
Above, plus electrification, new vehicle fleet, new I-95/Rte 20 Station

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Station and track upgrades, new I-95/Rte 20 station, new Sullivan Sq. station

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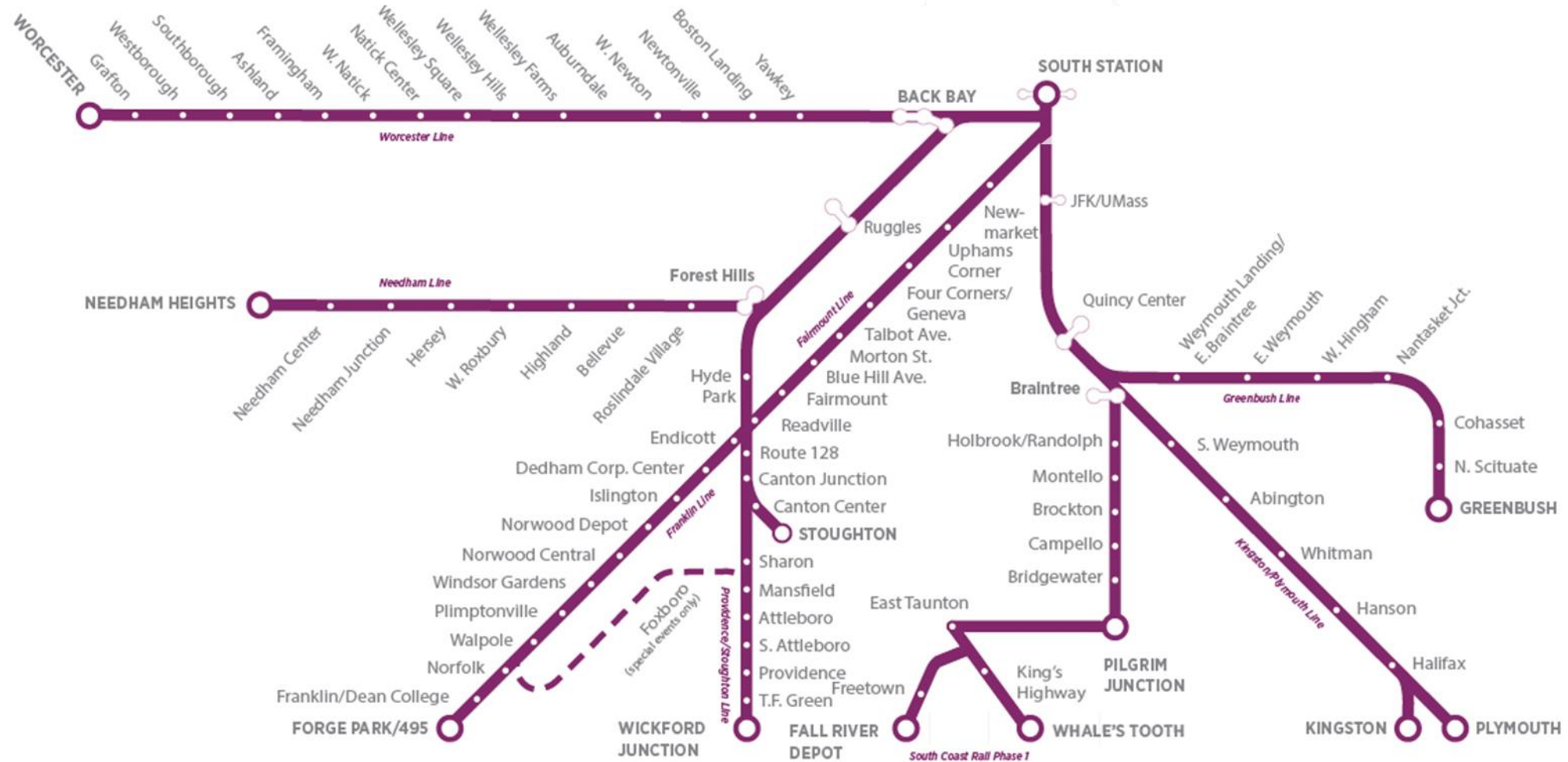
Same as Concept 5, except no Alewife connection



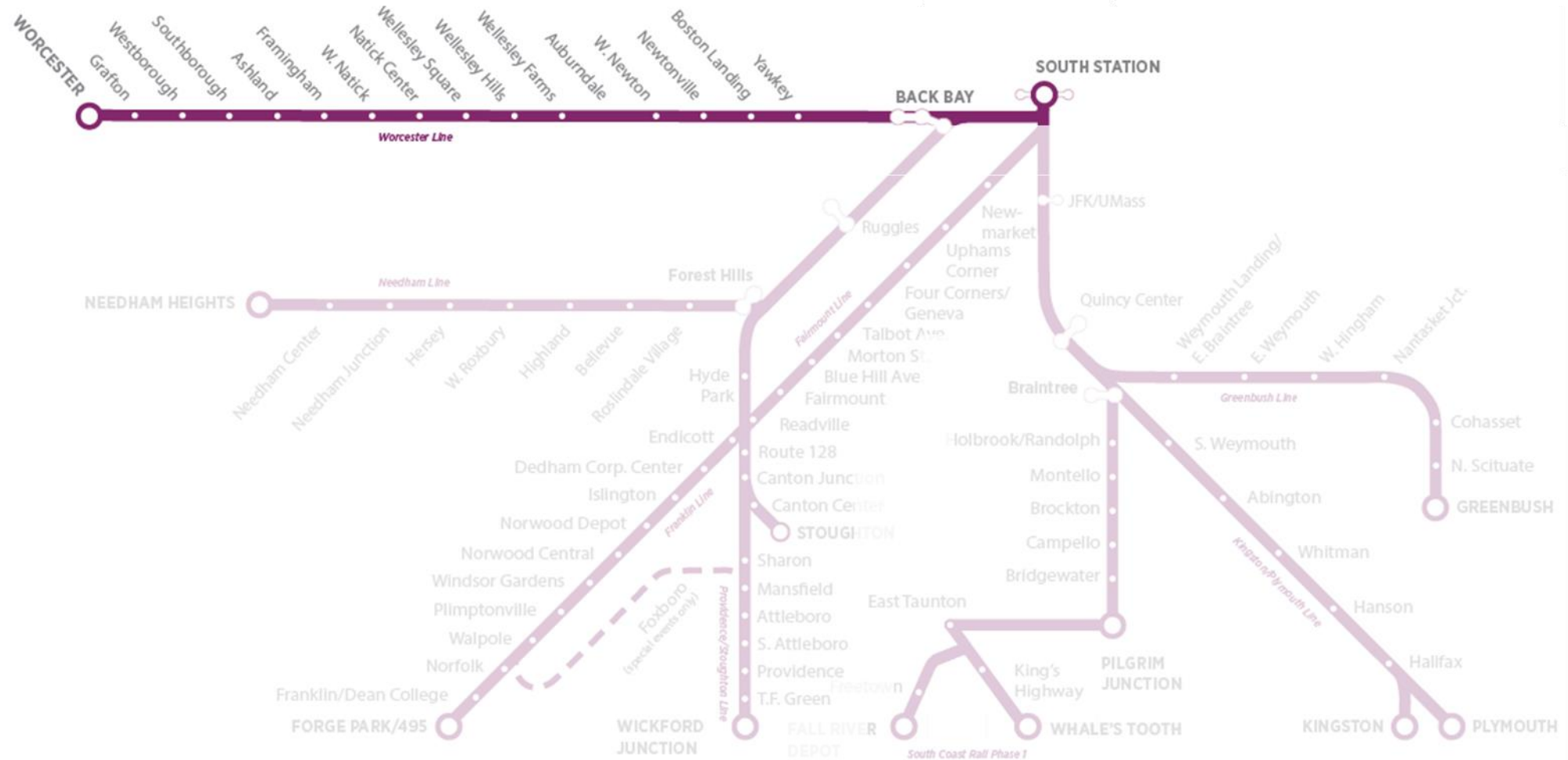


## South Side

# South Side Lines



# Worcester Line



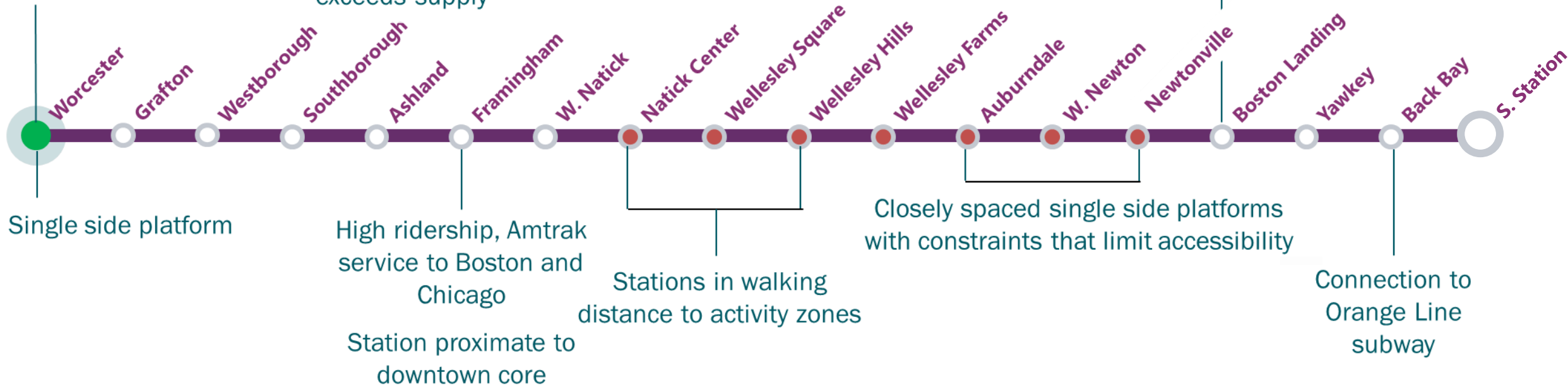
# Worcester Line Existing Conditions

- Second highest ridership line and one of the longest lines in the system.
- Serves communities to the west of Boston, parallel to the Massachusetts Turnpike (I-90).
- Long corridor serves different needs within it, from closely spaced, capacity constrained inner stations to suburban commuter stations to Worcester and Framingham, two of the Commonwealth's largest residential and employment centers outside Boston.

Highest ridership on line

Amtrak service to Boston and Chicago

Parking demand at these stations often exceeds supply



# Worcester Line Concept Matrix



ID	CONCEPT	PEAK TRAINS/HOUR	NOTES
0	No Build	Framingham, W. Natick, Yawkey, Back Bay: 3-4 All Other: 1-2	<ul style="list-style-type: none"> <li>Maintains current express/zonal express</li> </ul>
1	Pulse (Base)	Worcester, Framingham, Yawkey, Back Bay: 5 W. Natick: 4 All Other: 2	<ul style="list-style-type: none"> <li>Logical schedules</li> <li>Greater frequency</li> <li>Maintains express/zonal express structure, with more service beginning in Worcester</li> </ul>
2	Electrify Line	Same as Concept 1	<ul style="list-style-type: none"> <li>Similar to Concept 1</li> <li>Electrifies entire line</li> </ul>
3	Skip Stop	Worcester, Framingham, Yawkey, Back Bay: 5 W. Natick: 4 All Other: 1	<ul style="list-style-type: none"> <li>Each train serves every other stop</li> <li>Transfers to all services available at Framingham and West Natick stations</li> </ul>
4	Urban Rail, Interline Riverside to Grand Junction (7.5 min freq.)	Worcester-Ashland: 2 Framingham, W. Natick, Yawkey, Back Bay: 6 Natick Ctr-Riverside: 4 Auburndale-Boston Landing: 8 West Station: 10 Grand Junction: 4	<ul style="list-style-type: none"> <li>Retains express/zonal express between Worcester and South Station</li> <li>New Riverside connection</li> <li>Urban rail service between Riverside and Grand Junction to Cambridge</li> </ul>
5	Urban Rail, Interline Riverside to Grand Junction (15 min freq.)	Worcester-Ashland: 2 Framingham, W. Natick, Yawkey, Back Bay: 4 Natick Ctr-Riverside: 2 Auburndale-Boston Landing: 4 West Station: 6 Grand Junction: 2	<ul style="list-style-type: none"> <li>Similar to Concept 4 but with lower frequencies between Riverside and Boston</li> </ul>

# Worcester Line Key Performance Metrics

**Major Infrastructure**

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2<sup>nd</sup> platform at Newton stations

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Above plus Electrification, new vehicle fleet

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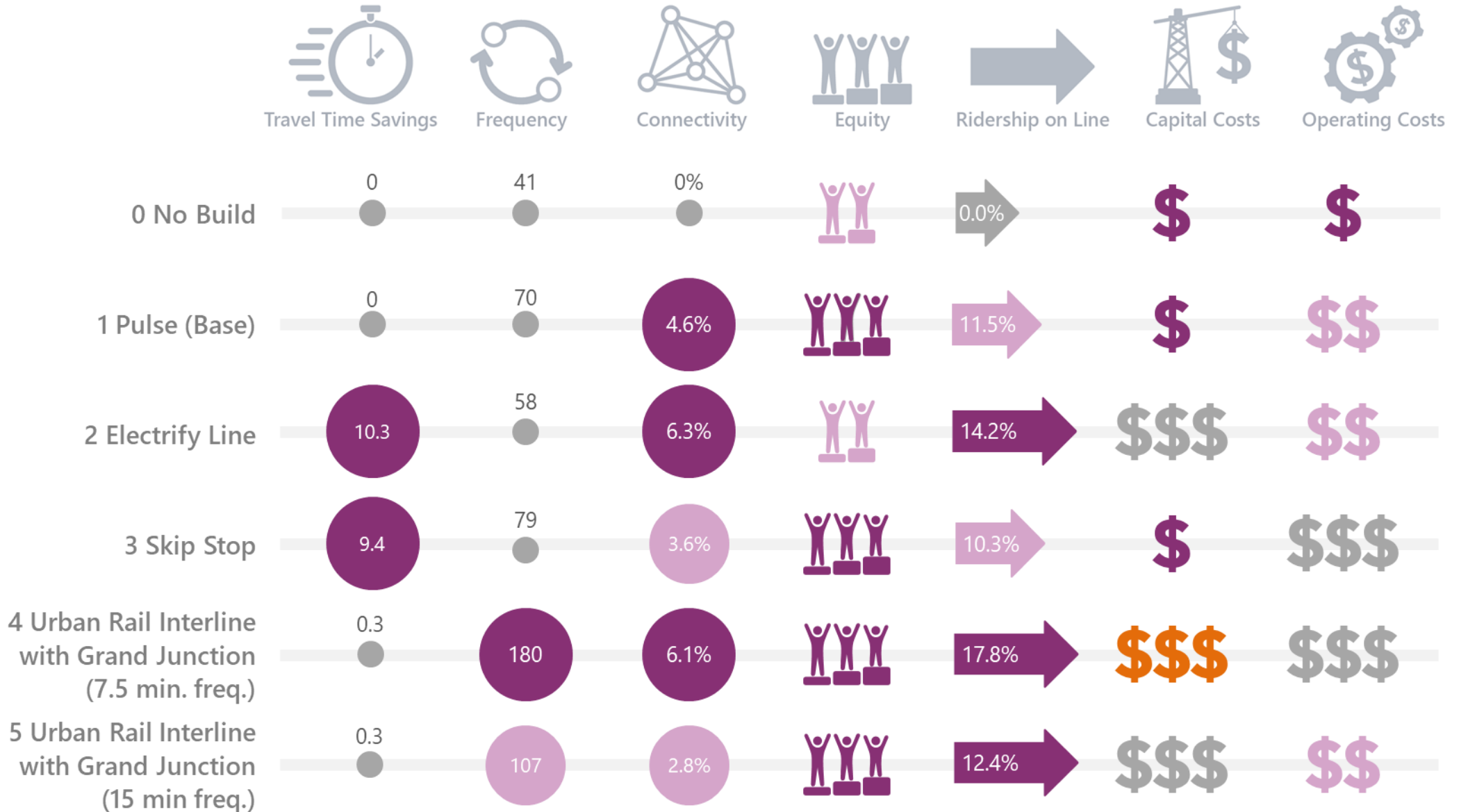
2<sup>nd</sup> platform at Newtons, siding at Auburndale

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Above plus 4 tracks through Newtons, electrification, new Riverside connection, upgrade to Grand Junction

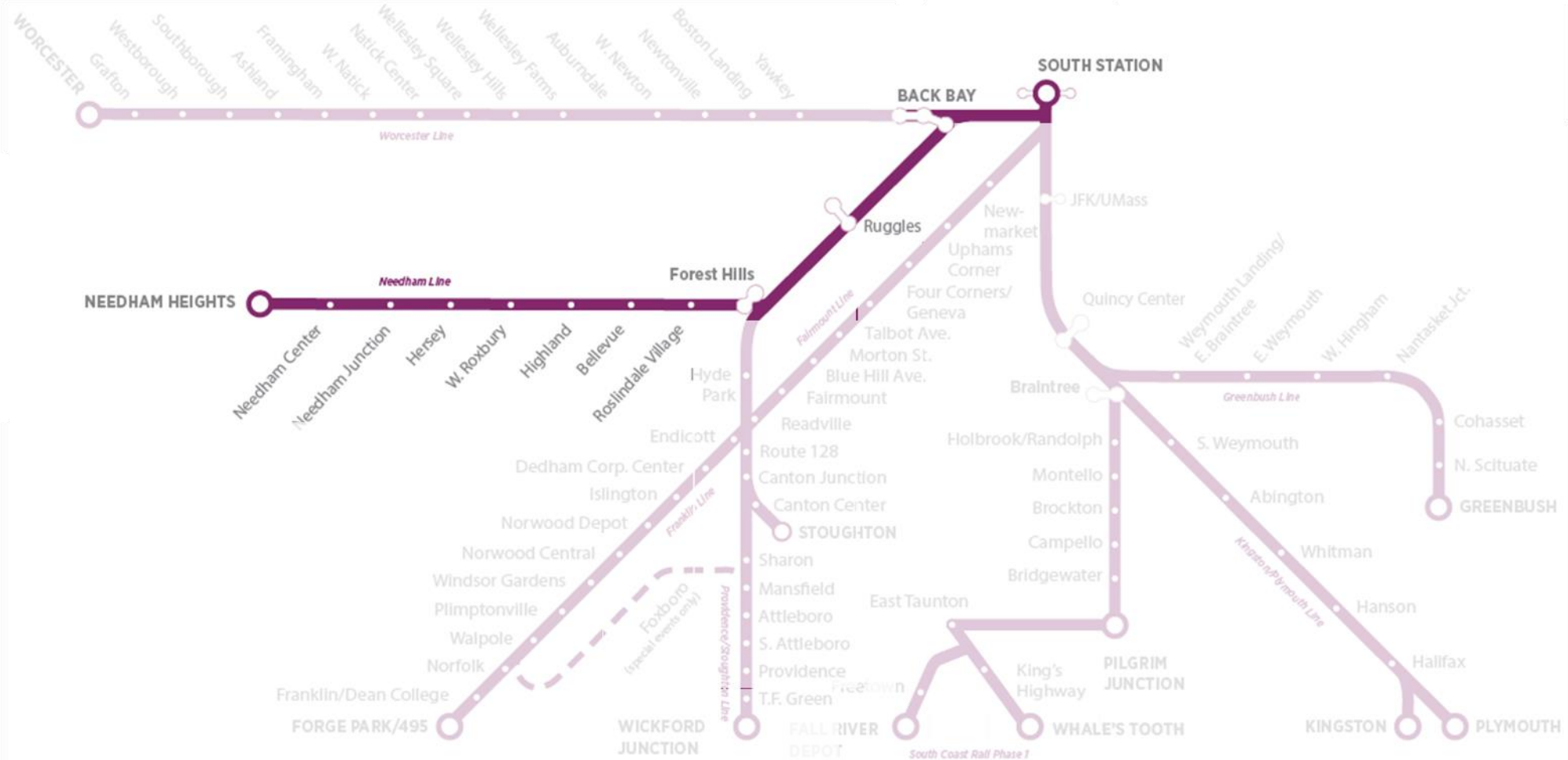
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2<sup>nd</sup> platform at Newtons, electrification, new Riverside connection, upgrade to GJ



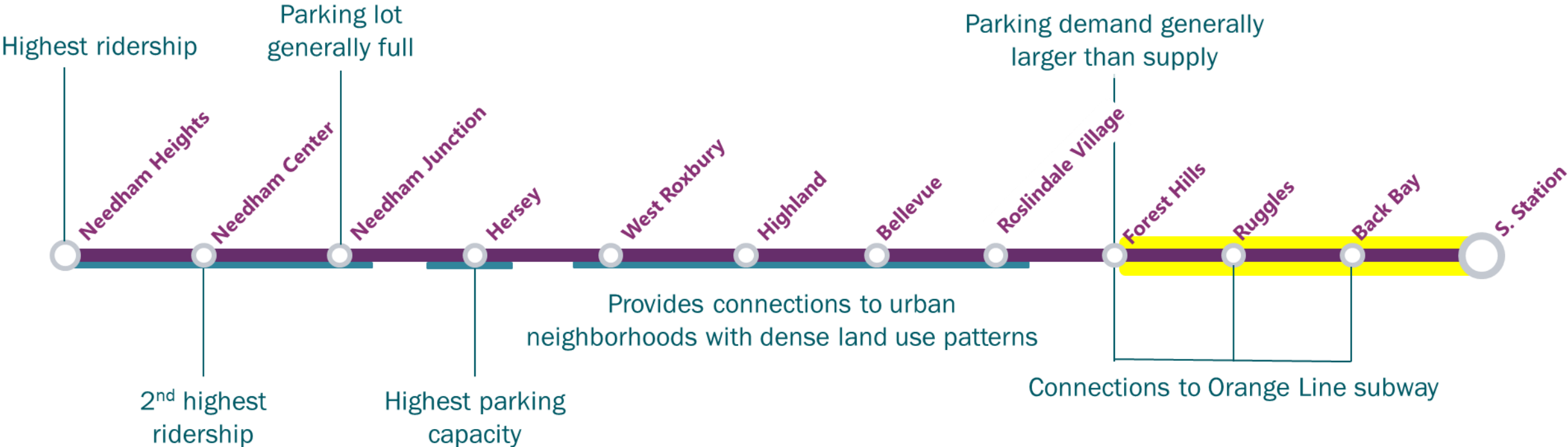


# Needham Line



# Needham Line Existing Conditions

- Parallels Orange Line between Boston and Forest Hills. No Sunday service.
- One of the shortest commuter rail lines, only 14 miles in length.
- Shares a busy section of track between Forest Hills and South Station, sharing various sections with the Orange Line, Franklin Line, Providence/Stoughton Line, and Amtrak.



# Needham Line Concept Matrix



ID	CONCEPT	PEAK TRAINS/HOUR	NOTES
0	No Build	1-2	
1	Pulse (Base)	2	<ul style="list-style-type: none"> <li>Logical schedules</li> <li>Greater frequency</li> </ul>
2	Express/Local	Needham Heights, Needham Ctr: 4 Needham Jct-Roslindale Village: 2 Forest Hills-Back Bay: 4	<ul style="list-style-type: none"> <li>Not quite a zonal express, this concept runs some express trains from Needham Center to Forest Hills</li> <li>Other trains run local service at same frequencies as Concept 1</li> </ul>
3	Urban Rail	4	<ul style="list-style-type: none"> <li>Electrifies entire line</li> </ul>
4	Convert to High-Capacity Transit	HCT	<ul style="list-style-type: none"> <li>Serves corridor with an alternative high-capacity transit mode to Forest Hills</li> </ul>

# Needham Line Key Performance Metrics

**Major Infrastructure**

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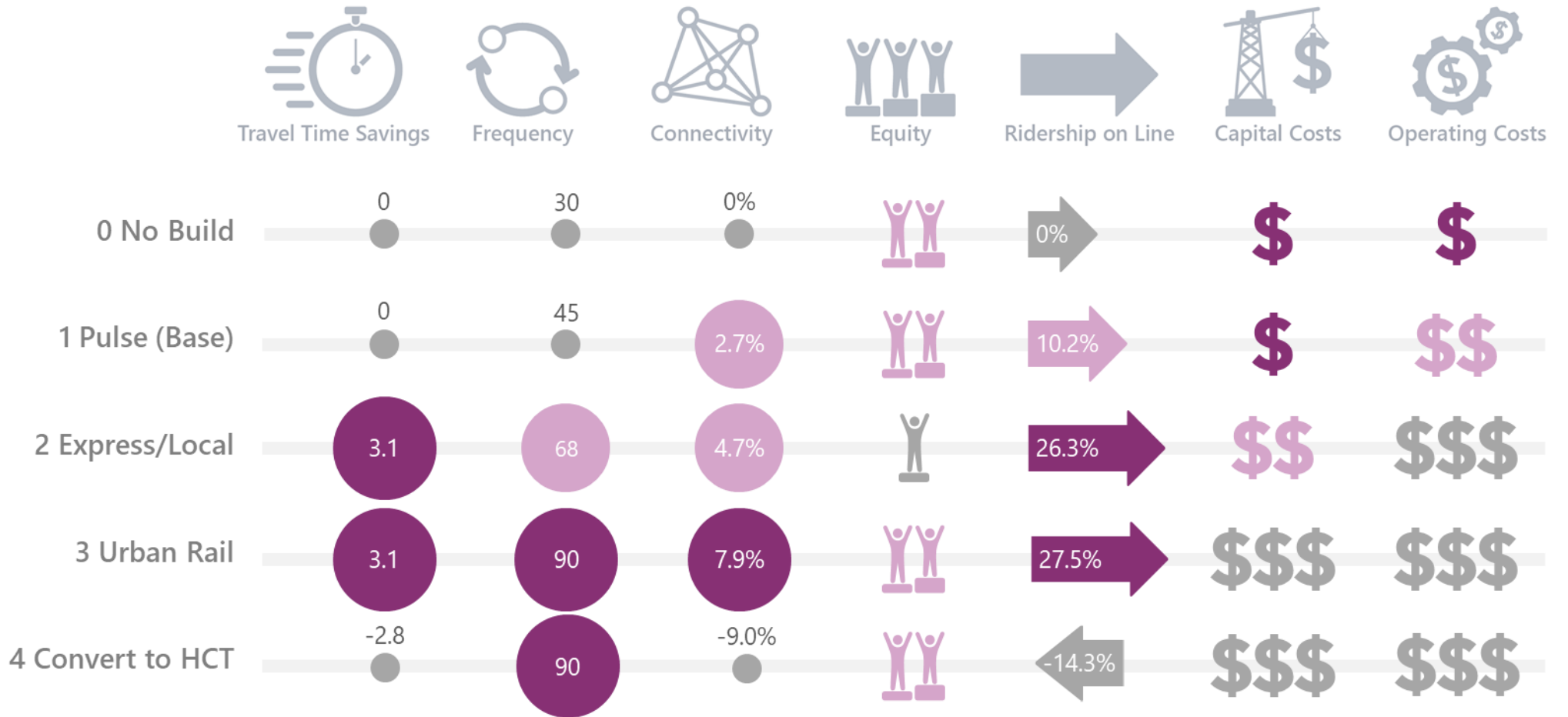
Double track and grade separate line

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Double track and grade separate line, electrification, new vehicle fleet

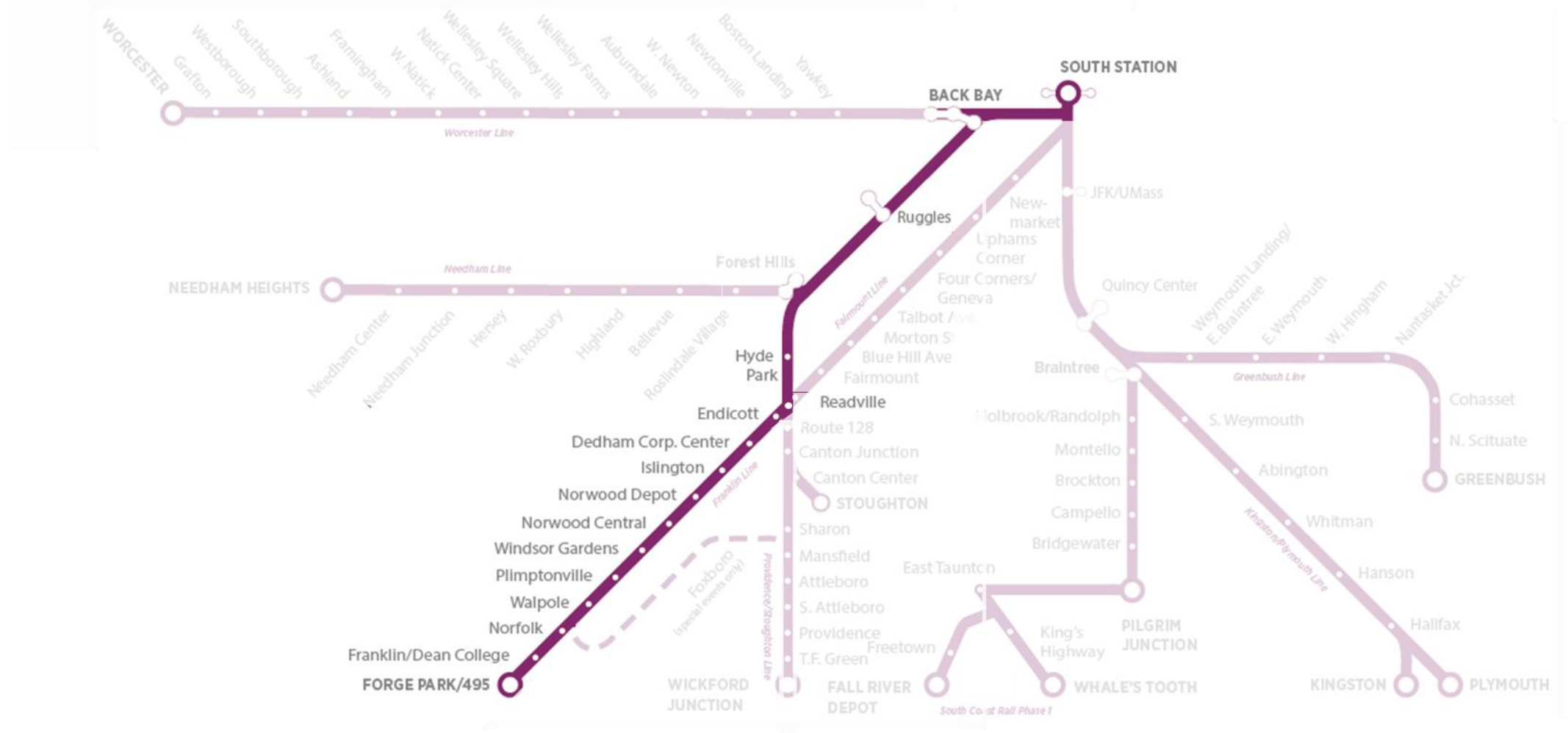
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Costs to convert line to HCT use



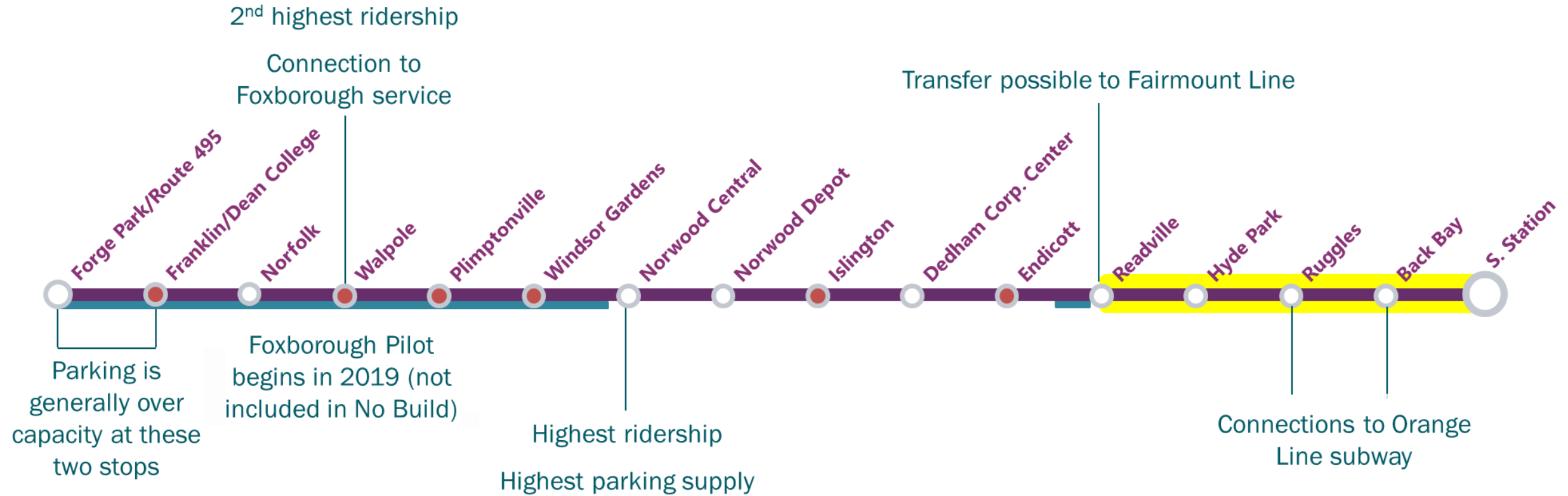
HCT = High-Capacity Transit

# Franklin Line



# Franklin Line Existing Conditions

- Limited special event service to Foxborough
- Long sections of single track, with many at-grade crossings and low-level platforms



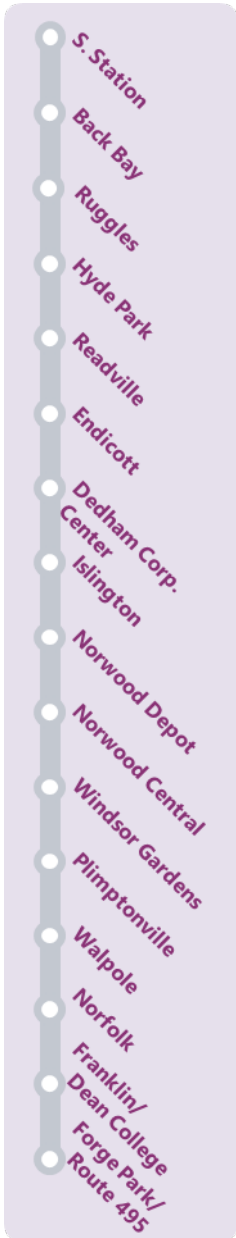
Single Track Section

Shared section – Northeast Corridor

Gateway Cities

Station Not Accessible – Low Level Platforms

# Franklin Line Concept Matrix



ID	CONCEPT	PEAK TRAINS/HOUR	NOTES
0	No Build	1-3	<ul style="list-style-type: none"> <li>Irregular stopping patterns</li> </ul>
1	Pulse (Base)	Forge Park/495-Norfolk: 2 Walpole-Back Bay: 4	<ul style="list-style-type: none"> <li>Logical schedules</li> <li>Greater frequency</li> </ul>
2	Zonal Express	Walpole, Norwood Central: 4 Dedham Corp. Ctr: 4 Back Bay, Ruggles: 4 All Other: 2	<ul style="list-style-type: none"> <li>Provides more express service between high ridership stations, including Boston</li> <li>Greater frequency at higher ridership stations</li> </ul>
3	Electrify Line	Same as Concept 1	<ul style="list-style-type: none"> <li>Electrifies entire line</li> </ul>
4	Zonal Express, Interline with Fairmount	Forge Park/495-Norfolk: 2 Windsor Gardens, Norwood Central: 2 Norwood Depot, Dedham Corp. Ctr: 6 All Other: 4	<ul style="list-style-type: none"> <li>Additional frequency at higher ridership stations</li> <li>Some service interlines with the Fairmount Line at Readville</li> </ul>

# Franklin Line Key Performance Metrics

**Major Infrastructure**

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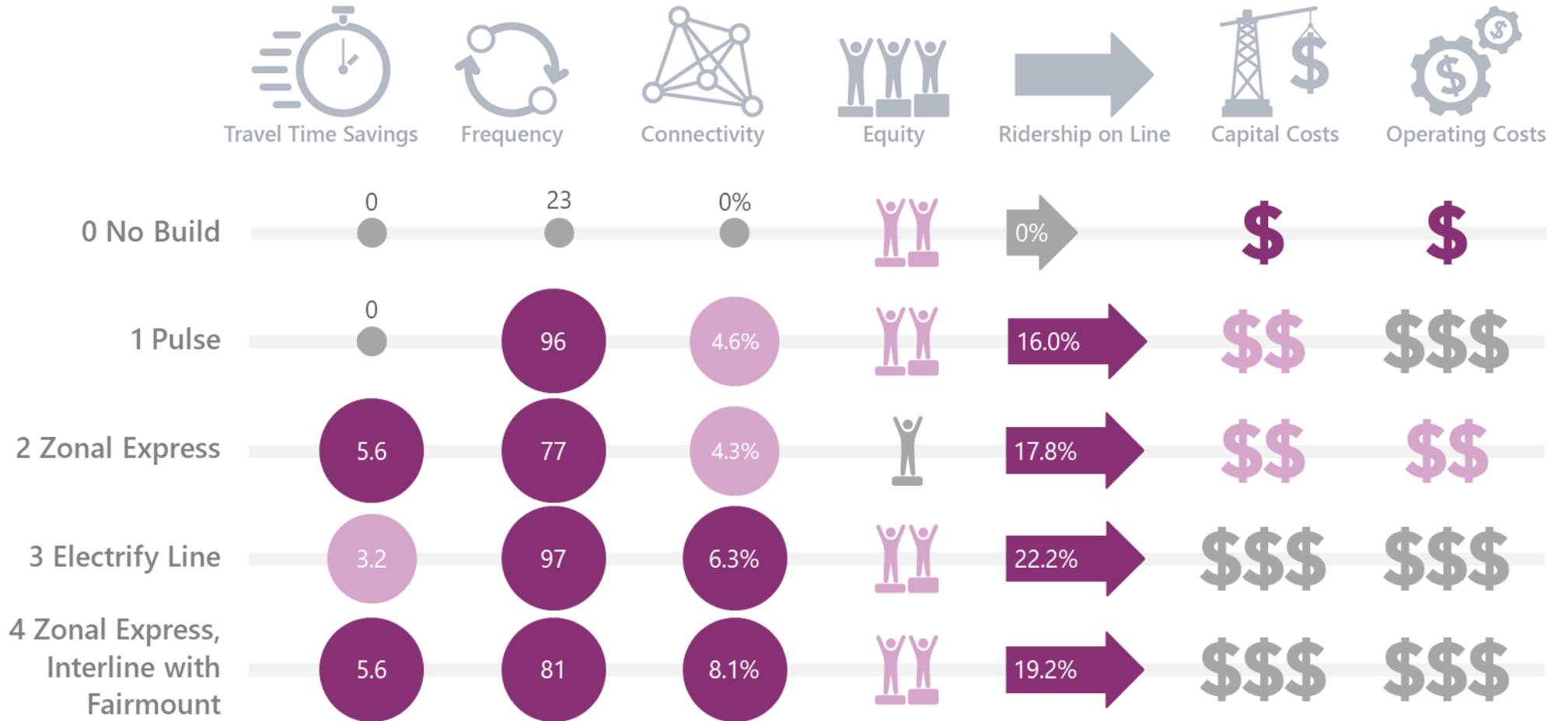
Station upgrades, double track Norwood Central to Walpole

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Above, plus electrification, new vehicle fleet

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Station upgrades, double track, plus major upgrades to Readville





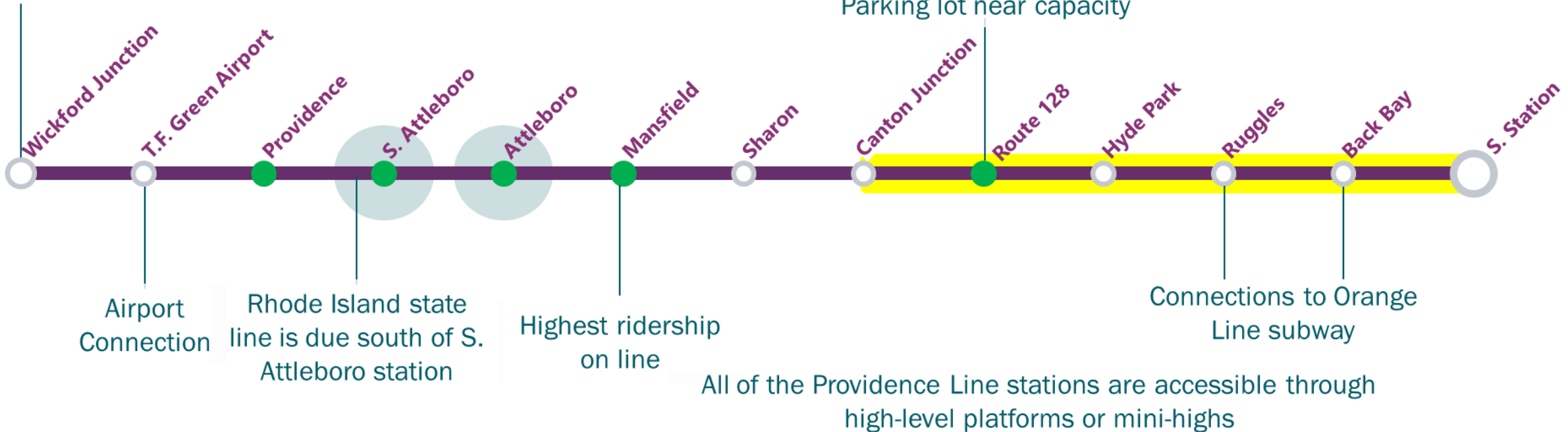
# Providence/Stoughton Lines



# Providence Line Existing Conditions

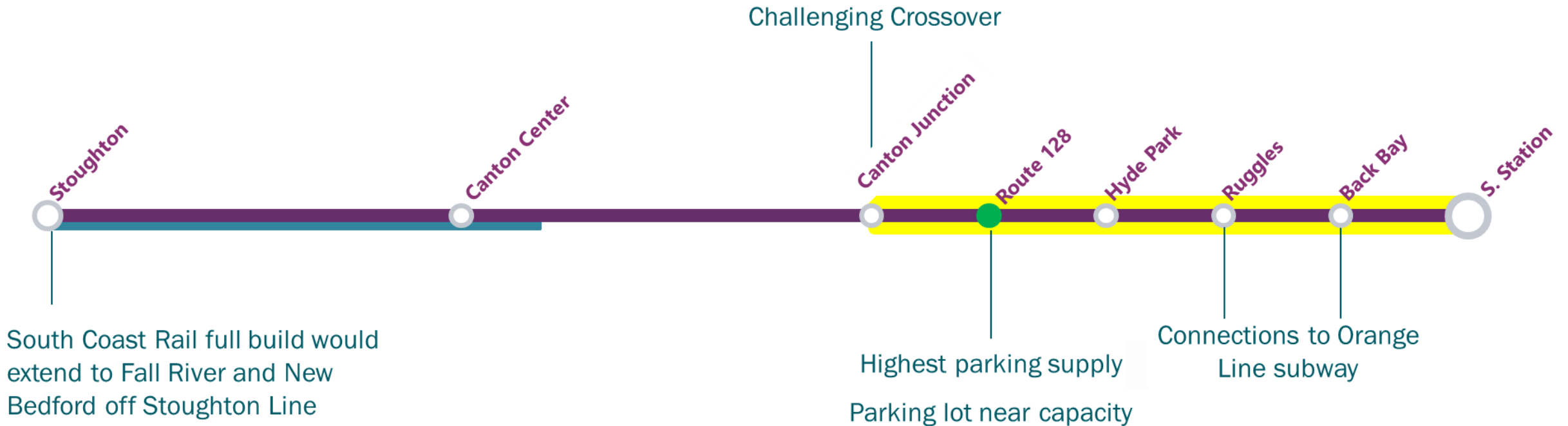
- The Providence Line sees the highest ridership on the commuter rail system – 5 of the 10 highest ridership stations on the system are on this line. At 63 miles, it is also the longest line.
- This line lies within the Northeast Corridor, which has been electrified by Amtrak for Acela service
- Shared corridor with Stoughton Line from Canton Junction to South Station and with Needham and Franklin from Readville to South Station

Adequate parking – could accommodate future ridership



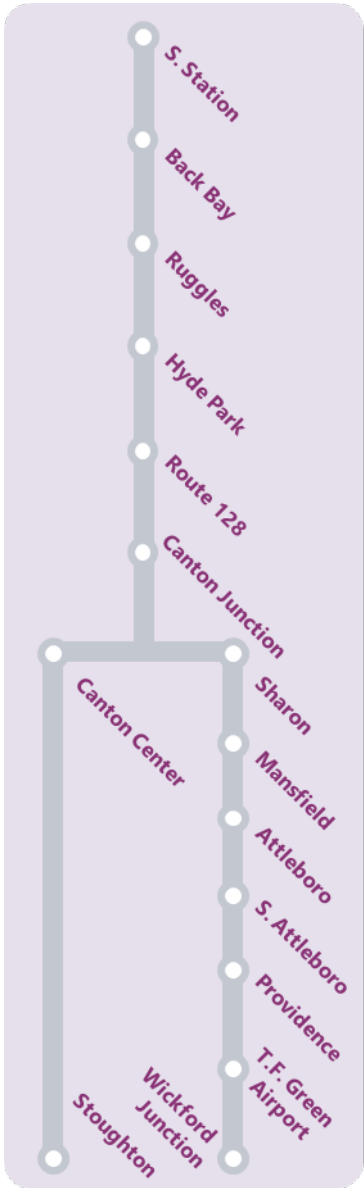
# Stoughton Line Existing Conditions

- Capacity constraints include single track sections, parking lots that are nearing capacity, and a challenging crossover at Canton Junction



Gateway Cities    
  Station in the Top 10 Highest Ridership Systemwide    
  Single Track Section  
 Station Not Accessible – Low Level Platforms    
  Shared section – Providence Line

# Providence/Stoughton Lines Concept Matrix



ID	CONCEPT	PEAK TRAINS/HOUR	NOTES
0	No Build	Wickford Jct., TF Green: 1 Providence-Sharon: 1-3 Stoughton, Canton Ctr: 1 Canton Jct-Back Bay: 2-4	
1	Pulse (Base)	Wickford Jct., TF Green: 2 Providence-Sharon: 4 Stoughton-Ruggles: 2 Readville: 4 Back Bay: 6	<ul style="list-style-type: none"> <li>Logical schedules</li> <li>Greater frequency</li> </ul>
2	High Frequency	Wickford Jct., TF Green: 2 Providence-Sharon: 4 Stoughton-Ruggles: 4 Readville: 6 Back Bay: 8	<ul style="list-style-type: none"> <li>Logical schedules</li> <li>Greater frequency on Stoughton Line during peak and on both lines off-peak</li> </ul>
3	Electrify Line	Same as Concept 2	<ul style="list-style-type: none"> <li>Electrifies entire line</li> </ul>
4	Electrify Line, Interline Stoughton with Fairmount	Wickford Jct., TF Green: 2 Providence-Sharon: 4 Stoughton-Route 128: 4 Readville, Back Bay: 6 Hyde Park, Ruggles: 2	<ul style="list-style-type: none"> <li>Similar to Concept 3</li> <li>Half of Stoughton service interlines with Fairmount Line</li> </ul>

# Providence/Stoughton Lines Key Performance Metrics

**Major Infrastructure**

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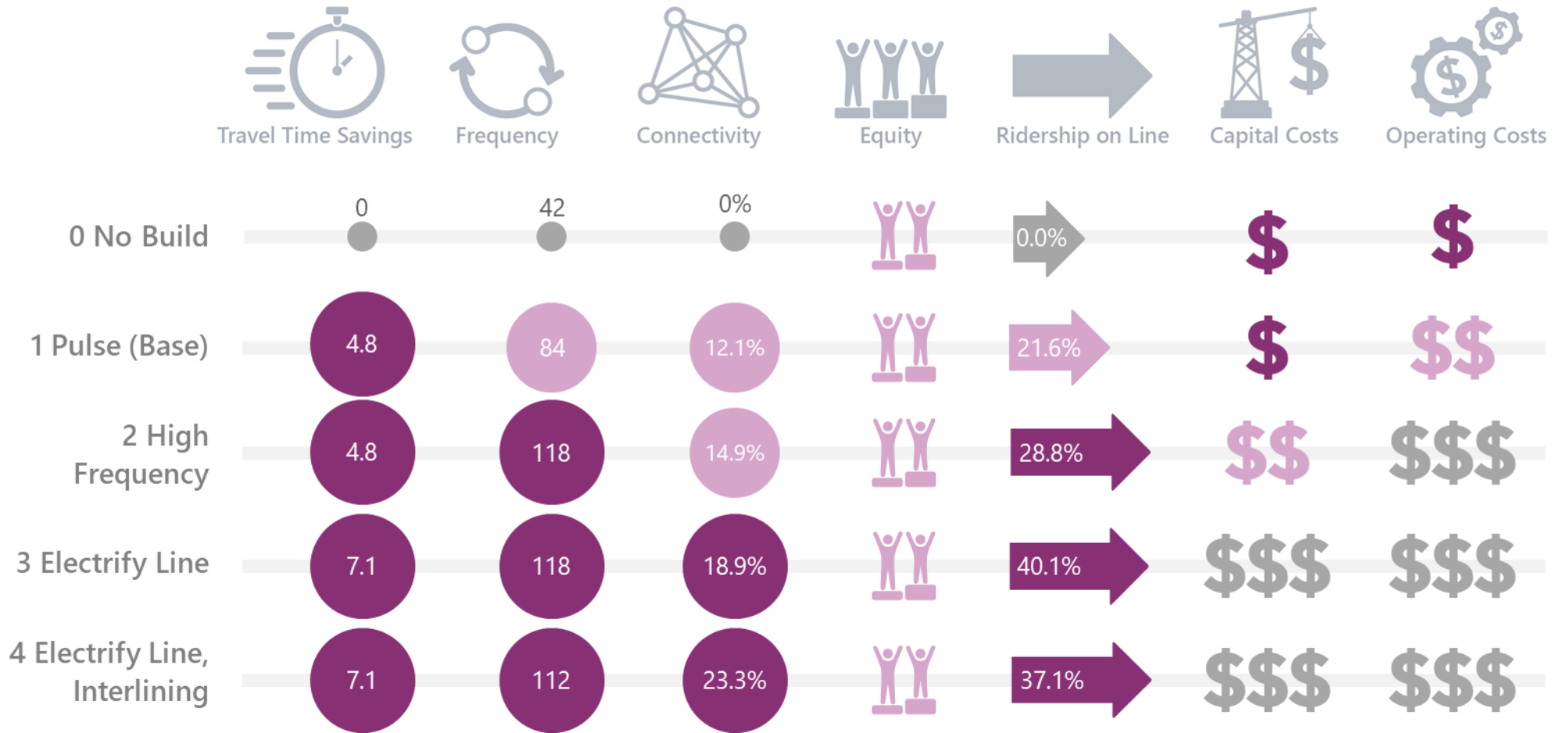
Station upgrades and passing tracks

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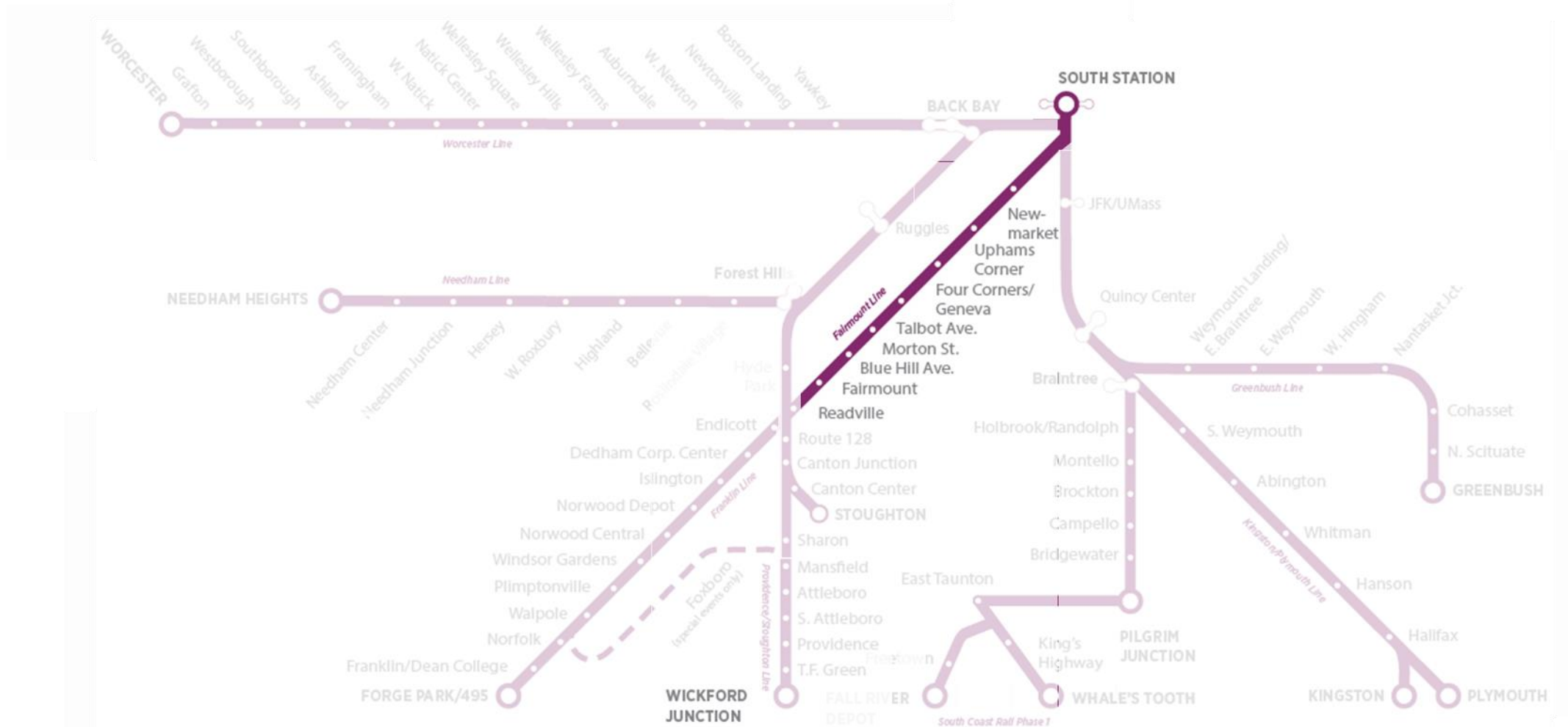
Above plus electrification, new vehicle fleet

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Above plus major upgrades to Readville



# Fairmount Line

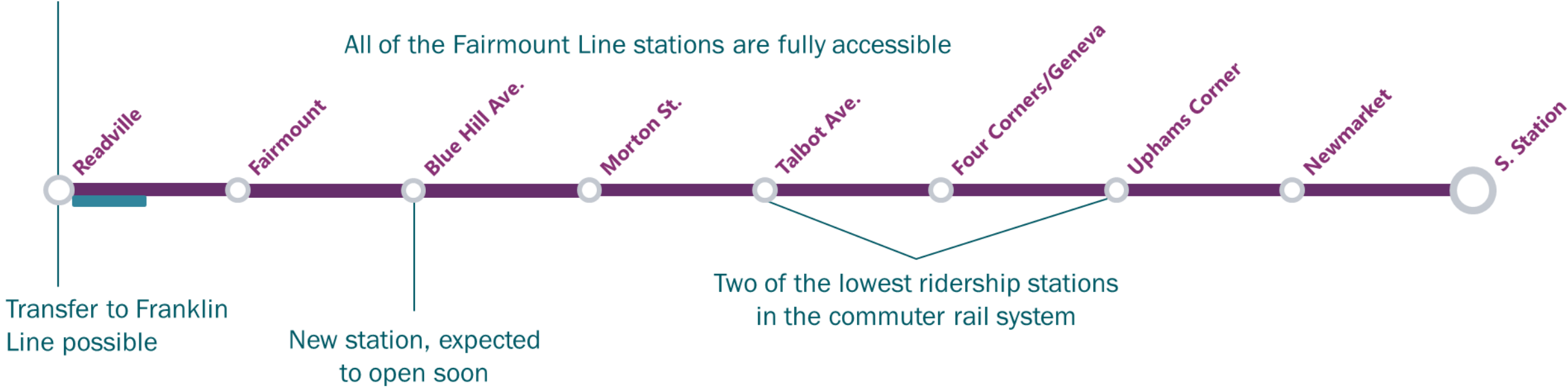


# Fairmount Line Existing Conditions

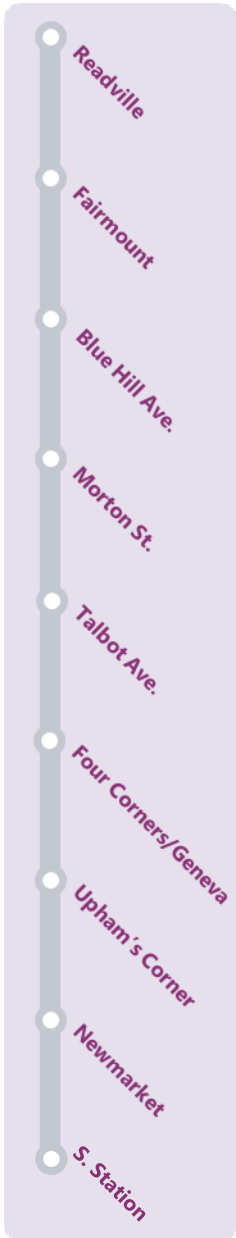
- All stations except Readville are within Zone 1A and the entire line is under 10 miles long, all double track.
- Fewest number of stations for any line on the South Side (same number as Lowell on North Side).
- Lowest line ridership of all commuter rail lines.
- This line serves low-income communities.
- Higher percentage of intra-line trips are taken on this line (local travel between intermediary stations) than on any other line in the system.

Highest ridership and largest parking supply on line

All of the Fairmount Line stations are fully accessible



# Fairmount Line Concept Matrix



ID	CONCEPT	PEAK TRAINS/HOUR	NOTES
0	No Build	1-2	<ul style="list-style-type: none"> <li>Includes construction and operations at Blue Hill Ave Station (to be opened in 2019)</li> </ul>
1	Pulse (Base)	4	<ul style="list-style-type: none"> <li>Logical schedules</li> <li>Greater frequency</li> </ul>
2	Interlining with Franklin Line	4	<ul style="list-style-type: none"> <li>Pulse service, interlining half of service with the Franklin Line</li> </ul>
3	Urban Rail	4	<ul style="list-style-type: none"> <li>Electrifies entire line</li> </ul>
4	Urban Rail with Higher Frequencies	6	<ul style="list-style-type: none"> <li>Similar to Concept 3 but provides 10 minute all-day service frequency</li> </ul>



# Fairmount Line Key Performance Metrics

**Major Infrastructure**

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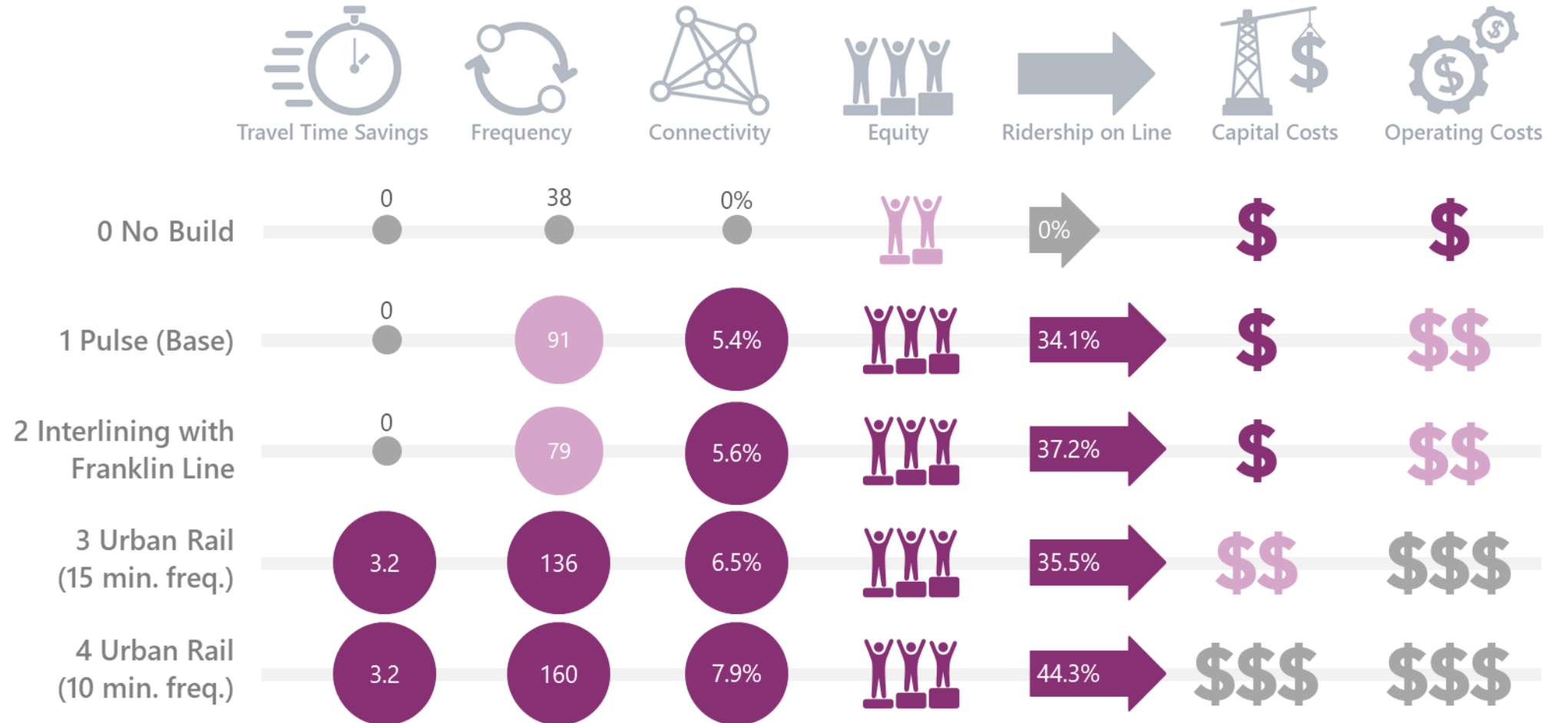


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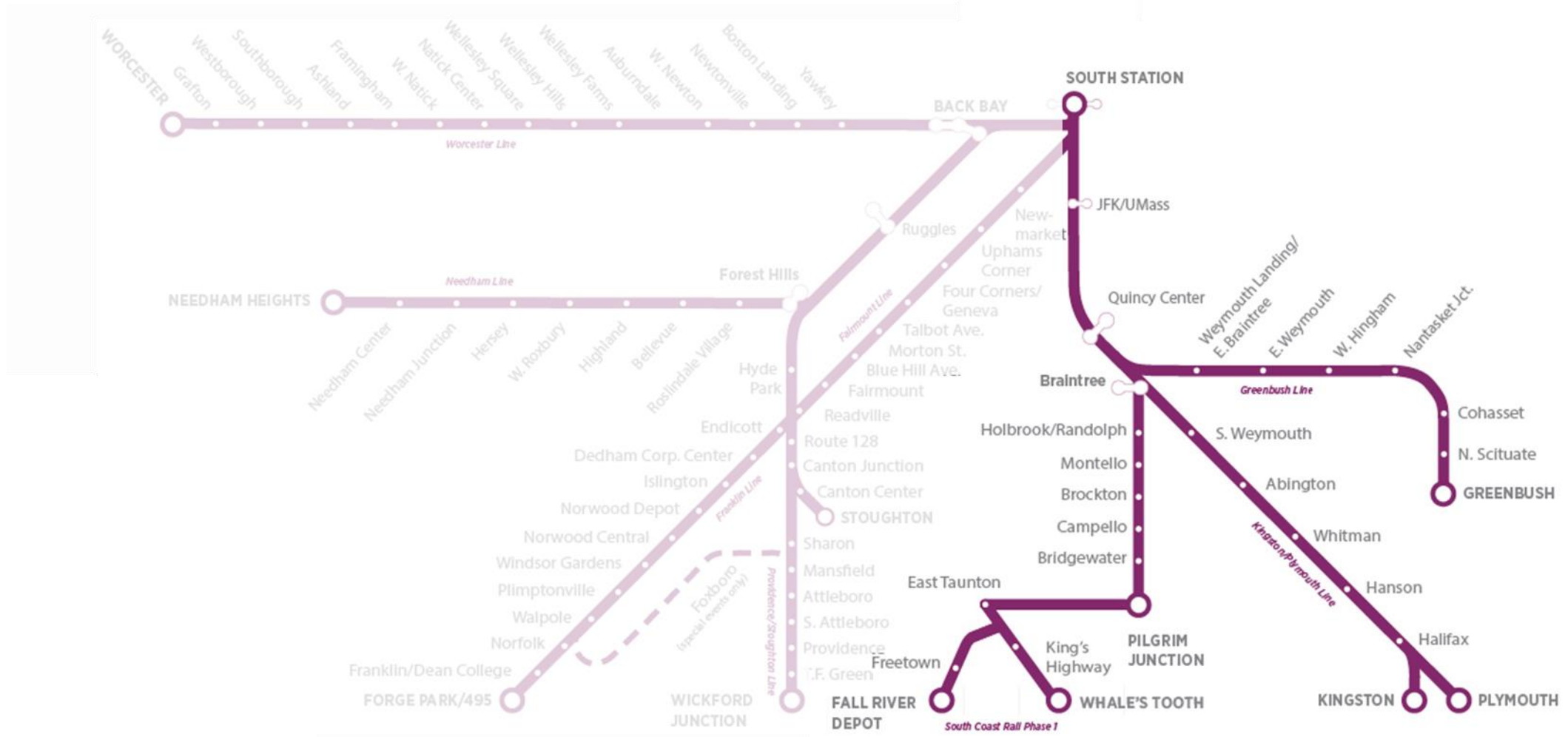
Electrification, new vehicle fleet

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Electrification, substantial terminal capacity



# Old Colony Lines

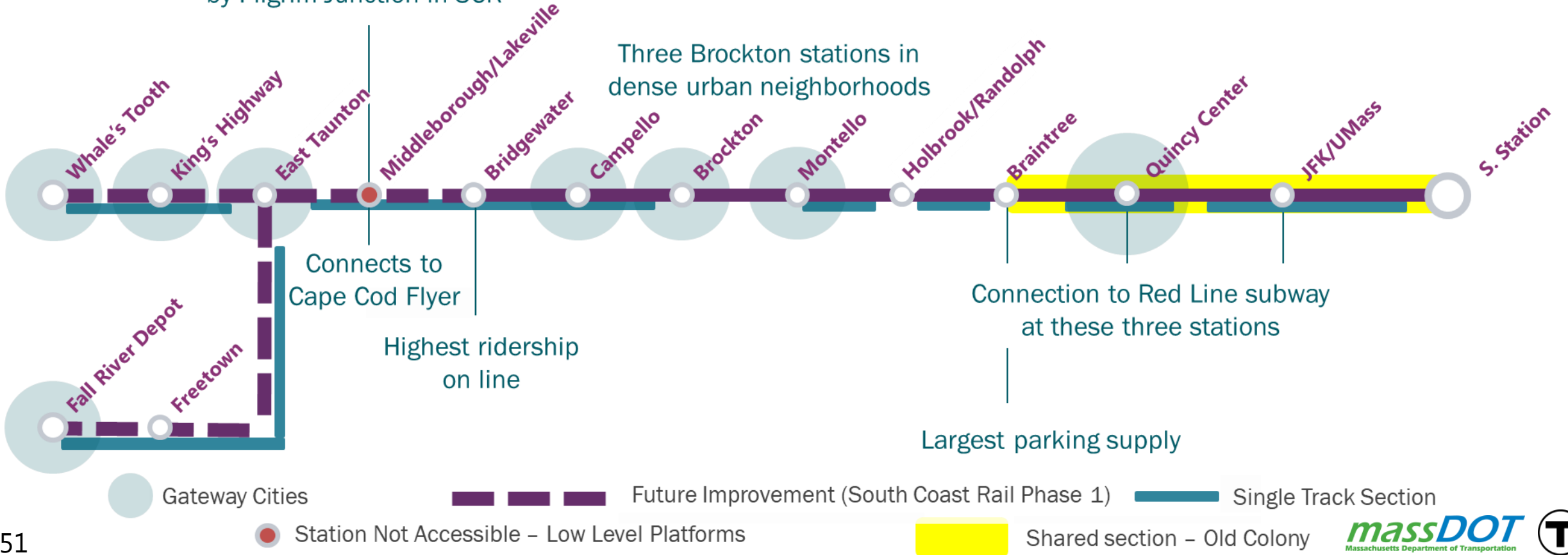


# Middleborough/Lakeville Line Existing Conditions

- This line will serve as the foundation for South Coast Rail Phase 1.
- Single track sections between Braintree and South Station cause reliability concerns.
- Line is used by Cape Cod Flyer, which continues south of Middleborough/Lakeville to Buzzards Bay.

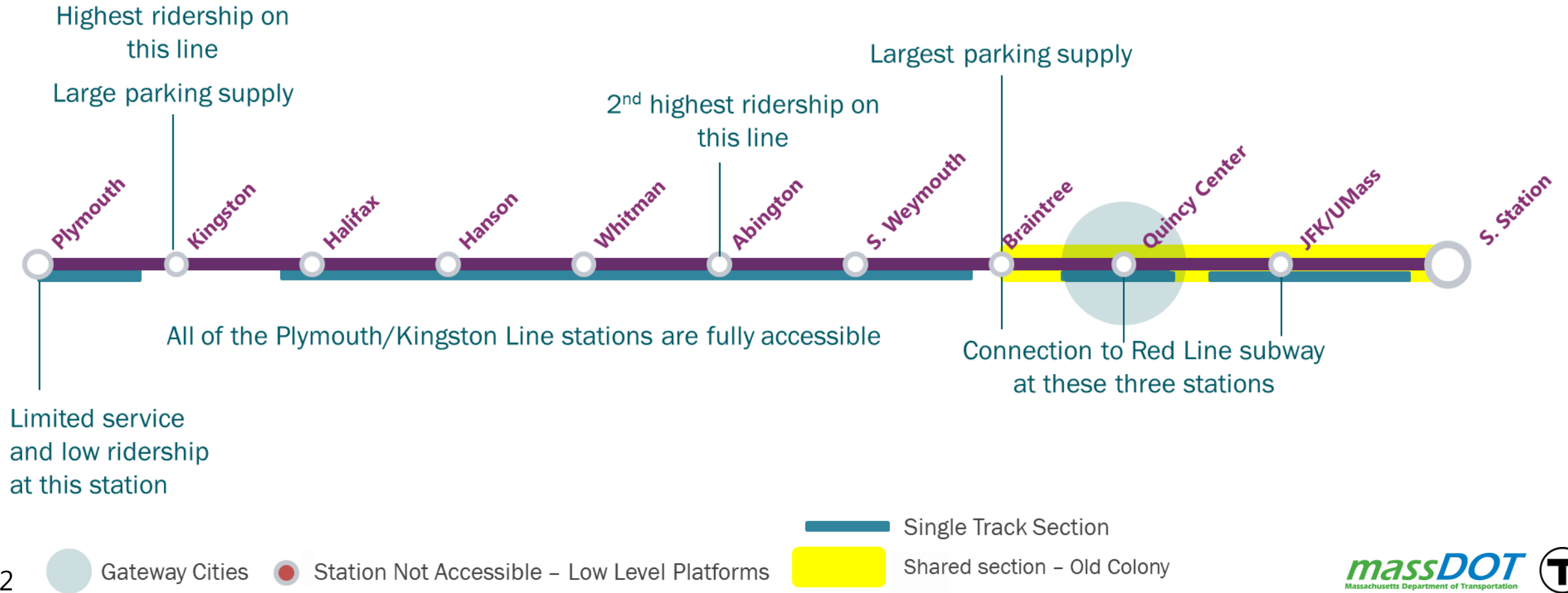
Current terminus. Will be replaced by Pilgrim Junction in SCR

All of the Middleborough/Lakeville Line stations are fully accessible



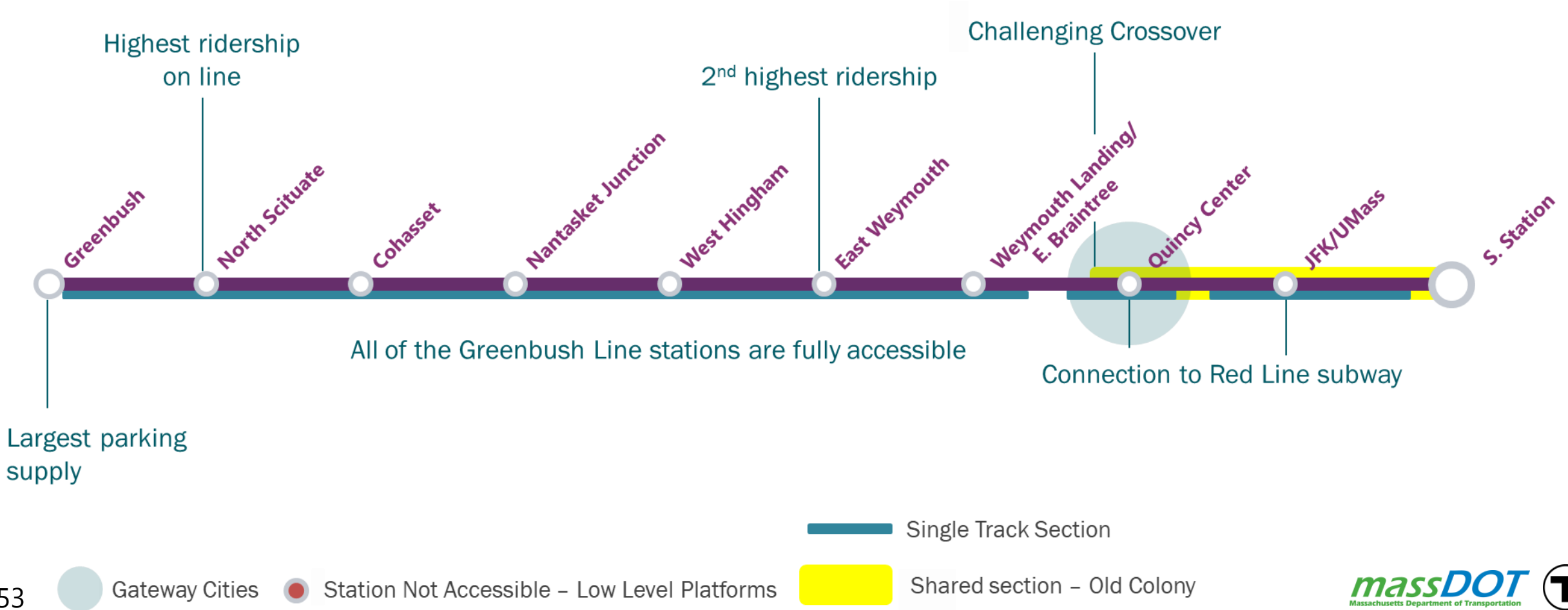
# Plymouth/Kingston Line Existing Conditions

- There is no freight activity on this corridor.
- Of the two termini, Kingston has much higher ridership. Plymouth's station location is difficult for many, ridership is low, and service is provided mainly in the off-peak.
- Single track sections between Braintree and South Station cause reliability concerns.



# Greenbush Line Existing Conditions

- Parking areas south of Braintree have ample capacity
- Much of this corridor is single track, and single track sections between Braintree and South Station cause reliability concerns



# Old Colony Lines Concept Matrix

ID	CONCEPT	PEAK TRAINS/HOUR	NOTES
0	No Build	1-2	<ul style="list-style-type: none"> <li>Irregular stopping patterns at some stations</li> </ul>
1	Pulse (Base)	SCR Phase 1 Branches: 1 Kingston, Plymouth: 1 Braintree: 5 All Other : 2	<ul style="list-style-type: none"> <li>Logical schedules</li> <li>Greater frequency</li> <li>One train per hour on Greenbush Line turns at Braintree</li> </ul>
2	Skip Stop	SCR Phase 1 Branches: 1 E. Taunton, Pilgrim Jct: 2 Middleborough/Lakeville: 2 Bridgewater, Kingston, Greenbush: 4 Braintree: 8 All Other: 3	<ul style="list-style-type: none"> <li>Each train serves every other stop</li> <li>One train per hour on each line turns at Braintree – all other trains continue to South Station</li> </ul>
3	Skip Stop/ Interlining Focus	Same as Concept 2, except: Braintree: 6	<ul style="list-style-type: none"> <li>SCR trains continue to South Station</li> <li>Half of all other trains turn at Braintree</li> </ul>
4	Electrify Line	Same as Concept 3	<ul style="list-style-type: none"> <li>Electrifies the entire line(s)</li> <li>Similar to Concept 3, with added direct service between Middleborough and South Station</li> </ul>
5	Forced Transfer	Same as Concept 2	<ul style="list-style-type: none"> <li>Similar to Concept 3, except that all Greenbush and Kingston/Plymouth trains turn at Braintree</li> </ul>

# Old Colony Line Travel Time Savings Metrics

Middleborough/Lakeville

Plymouth/Kingston

Greenbush



Travel Time Savings



Travel Time Savings



Travel Time Savings

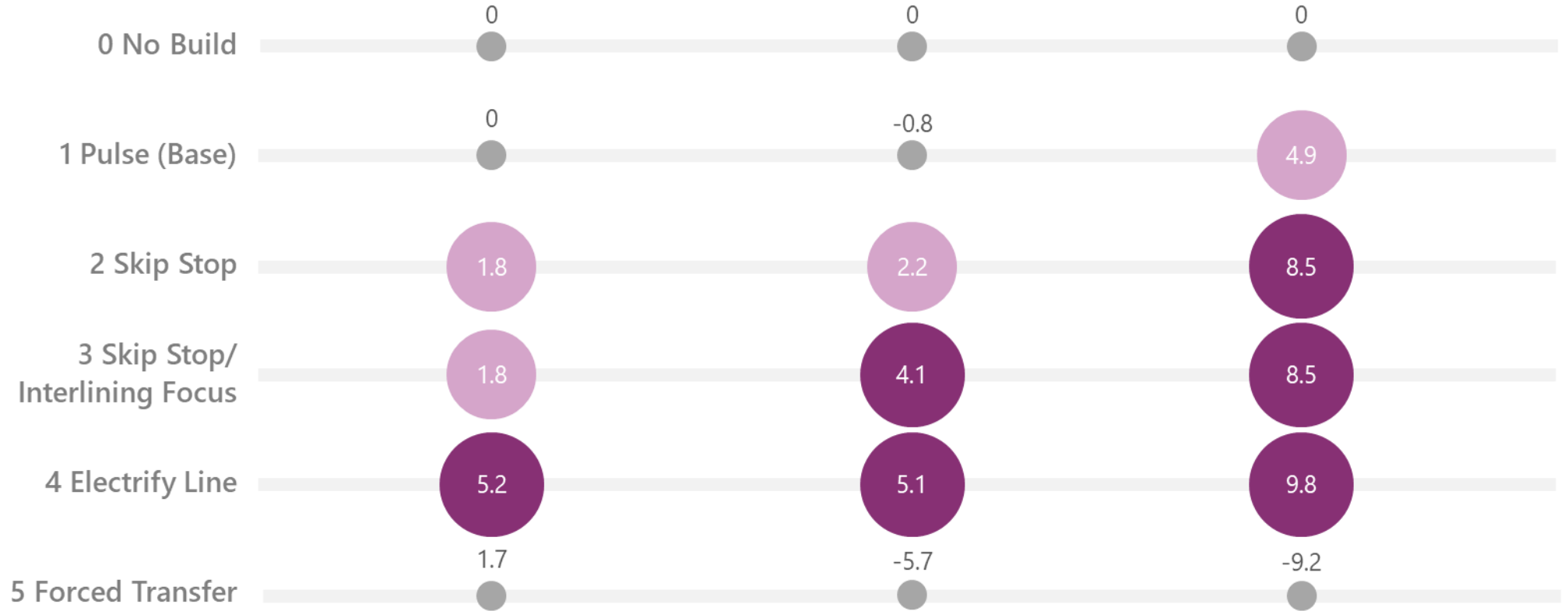
## Major Infrastructure

Double track Braintree to South Station, major upgrades to Braintree

Above, plus passing sidings at additional 9 locations

See Concept 2 plus passing sidings at additional 2 locations and electrification, new vehicle fleet

Major upgrades to Braintree station



# Old Colony Line Other Key Performance Metrics

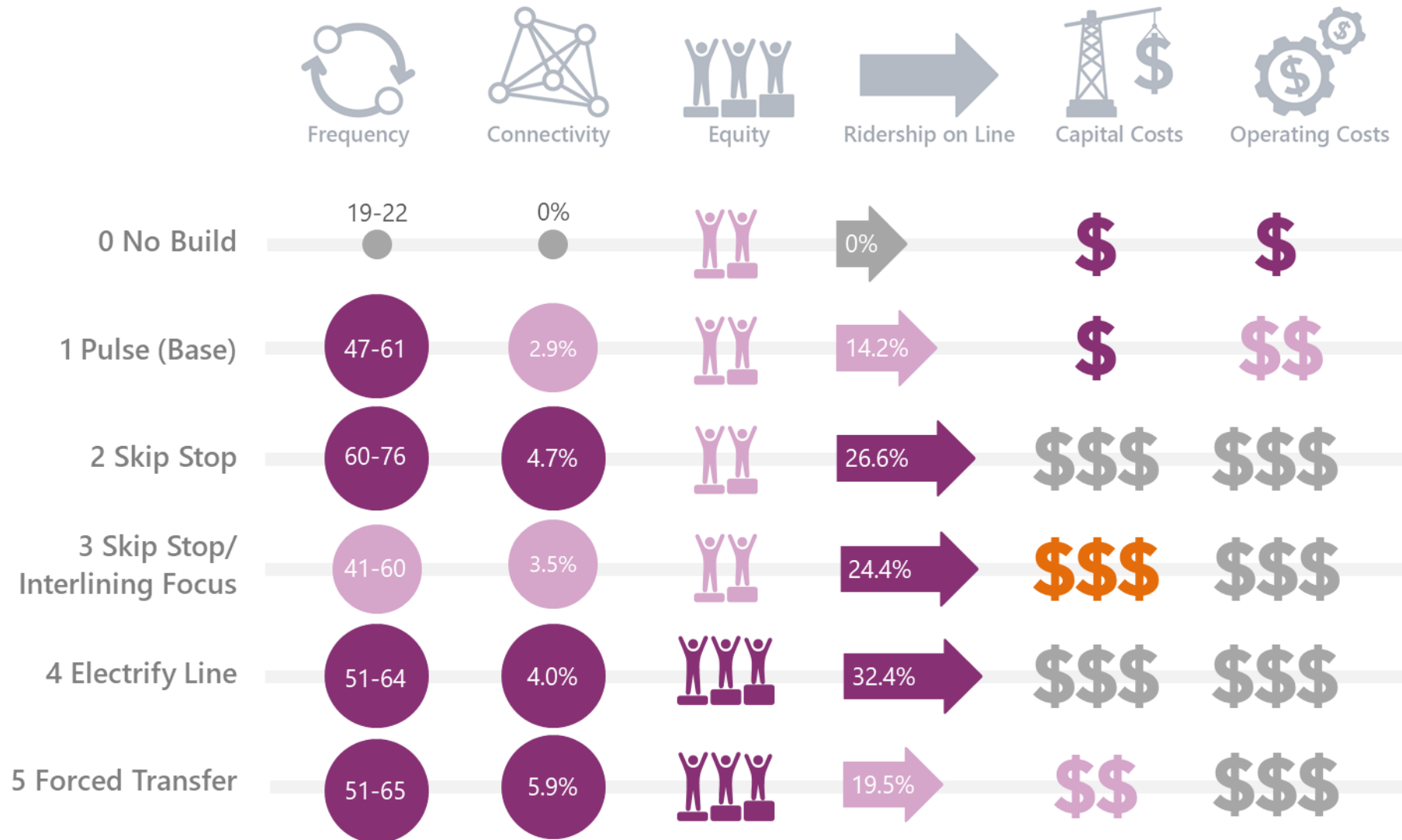
## Major Infrastructure

Double track Braintree to South Station, major upgrades to Braintree

Above, plus passing sidings at additional 9 locations

See Concept 2 plus passing sidings at additional 2 locations and electrification, new vehicle fleet

Major upgrades to Braintree station





## Next Steps

- Review feedback from Advisory Committee and FMCB on Tier 1 evaluation
- Create systemwide alternatives by linking individual service concepts
- Recommend up to 8 service alternatives to carry into Tier 2
- Seek public comment on the draft service alternatives *before* entering Tier 2