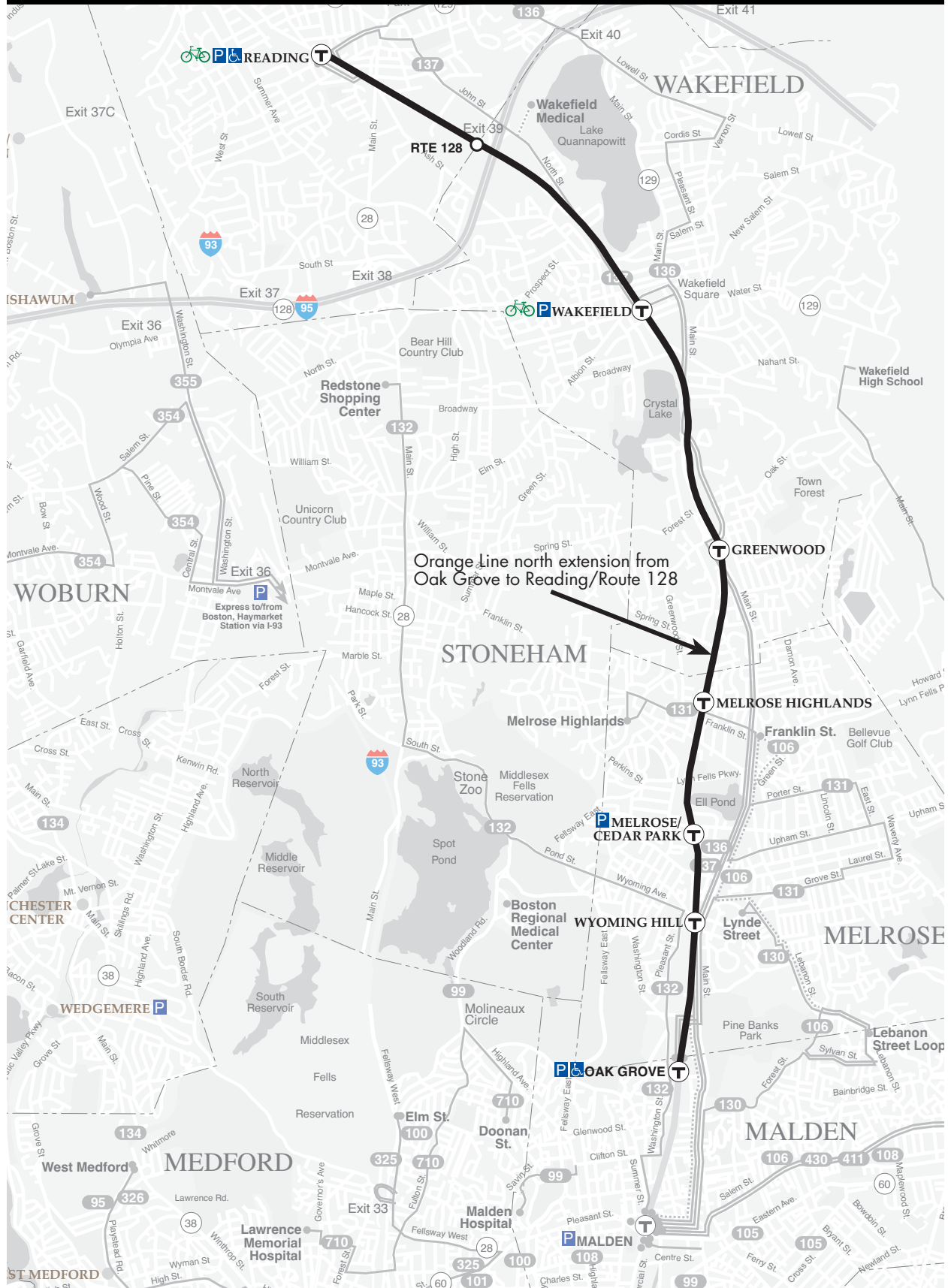


**MAP 5C-39 ORANGE LINE NORTH EXT. FROM OAK GROVE TO READING/RT 128**





## ORANGE LINE NORTH EXTENSION FROM OAK GROVE TO READING/RT 128

### Description

This project would extend Orange Line service from Oak Grove Station to Reading via the Haverhill/Reading commuter rail line right-of-way. Commuter rail service on this line would be discontinued between Boston and North Wilmington. Service to points further north would be re-routed via Wilmington and the Lowell Line.

### Capital Features

This would be a 6.5-mile extension, including six new stations, in Melrose, Wakefield, and Reading and elimination of 12 present grade crossings by lowering of the tracks and of one by building a new high-way overpass.

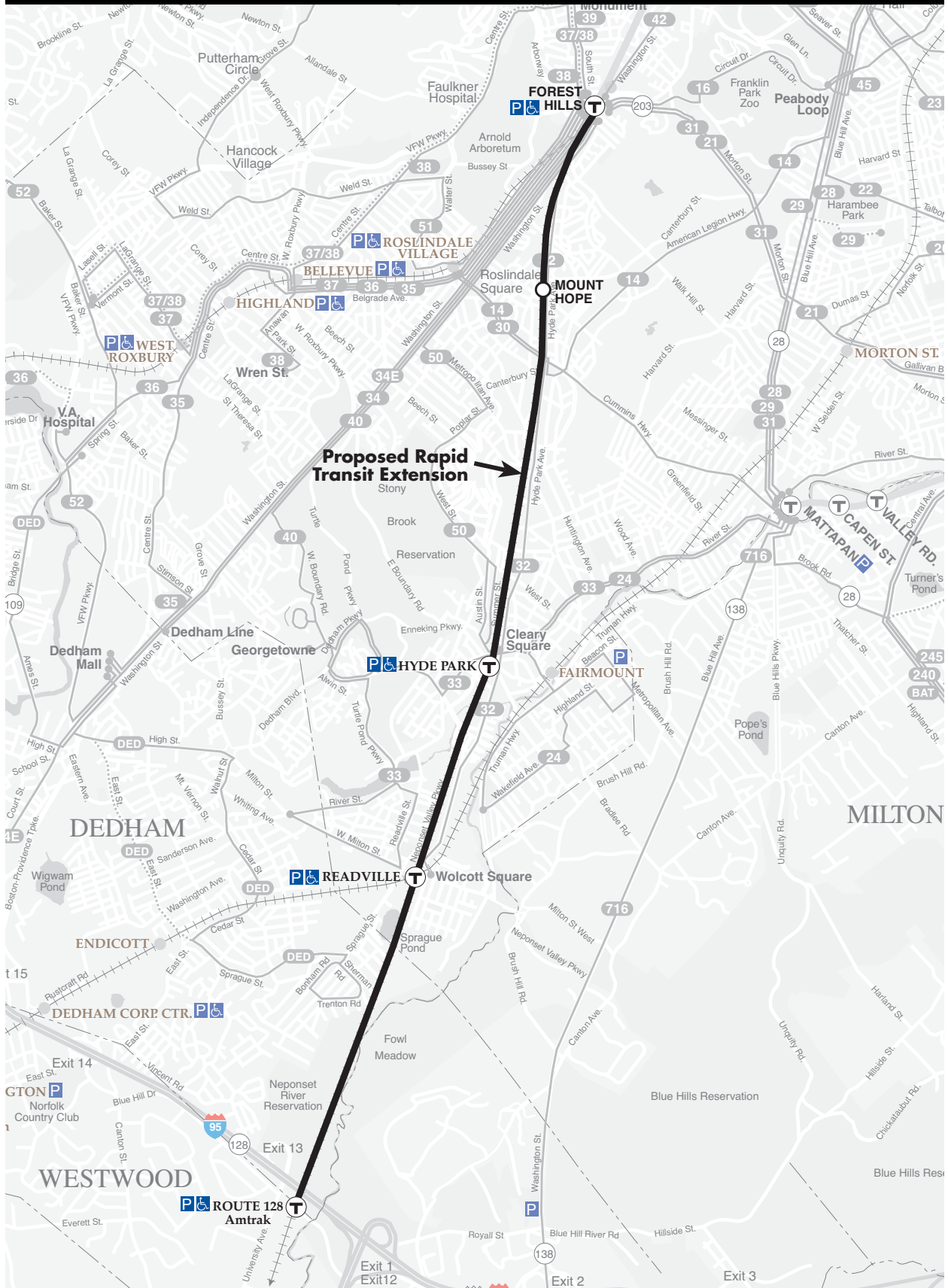
<b>Capital Cost</b>	<b>\$487.8 million (CTPS estimate)</b>
<b>Operating Cost</b>	<b>\$109,500 per weekday</b>
<b>Daily Ridership Increase on Mode</b>	<b>9,400</b>
<b>Net Increase in Daily Transit Ridership</b>	<b>5,400</b>
<b>Capital Cost per New Transit Rider</b>	<b>\$90,500</b>
<b>Operating Cost per Wkday/New Transit Rider</b>	<b>\$20.30</b>
<b>Capital Cost/Travel Time Benefit</b>	<b>\$413,800 per hour</b>
<b>Operating Cost/Travel Time Benefit</b>	<b>\$92.90 per hour</b>
<b>Travel Time Savings</b>	<b>1,179 hours per weekday</b>

### Assessment

Overall, this project is rated low priority. It would replace an existing commuter rail line with a rapid transit extension, providing more frequent service and eliminating a transfer for passengers with destinations on the Orange Line beyond walking distance of North Station. In absolute terms, the capital cost would fall in the upper mid-range of all rapid transit extensions examined for the PMT. It would, however, also be in the upper mid-range in terms of air quality improvement. It would not serve any environmental justice target communities.

Type of Project	Utilization	Mobility	Cost-Effectiveness	Air Quality	Service Quality	Economic/Land Use Impacts	Environ. Justice
Line Extension	►	○	○	►	○	○	○

# MAP 5C-40 ORANGE LINE SOUTH EXTENSION FROM FOREST HILLS TO RT 128





## ORANGE LINE SOUTH EXTENSION FROM FOREST HILLS TO RT 128

### Description

This project would extend Orange Line service from Forest Hills Station in Boston to Route 128 via the Providence commuter rail line right-of-way. Commuter and intercity rail passenger service on this line would also continue.

### Capital Features

This would be a 6.4-mile extension, including three stations in Boston neighborhoods and terminating at the existing Route 128 park-and-ride station. This segment of the rail line is already fully grade-separated. Some reconfiguration of the tracks would be needed to allow for two Orange Line tracks in addition to railroad tracks.

<b>Capital Cost</b>	<b>\$342.8 million (CTPS estimate)</b>
<b>Operating Cost</b>	<b>\$94,900 per weekday</b>
<b>Daily Ridership Increase on Mode</b>	<b>4,700</b>
<b>Net Increase in Daily Transit Ridership</b>	<b>2,000</b>
<b>Capital Cost per New Transit Rider</b>	<b>\$172,300</b>
<b>Operating Cost per Wkday/New Transit Rider</b>	<b>\$47.70</b>
<b>Capital Cost/Travel Time Benefit</b>	<b>\$677,100 per hour</b>
<b>Operating Cost/Travel Time Benefit</b>	<b>\$187.40 per hour</b>
<b>Travel Time Savings</b>	<b>506 hours per weekday</b>

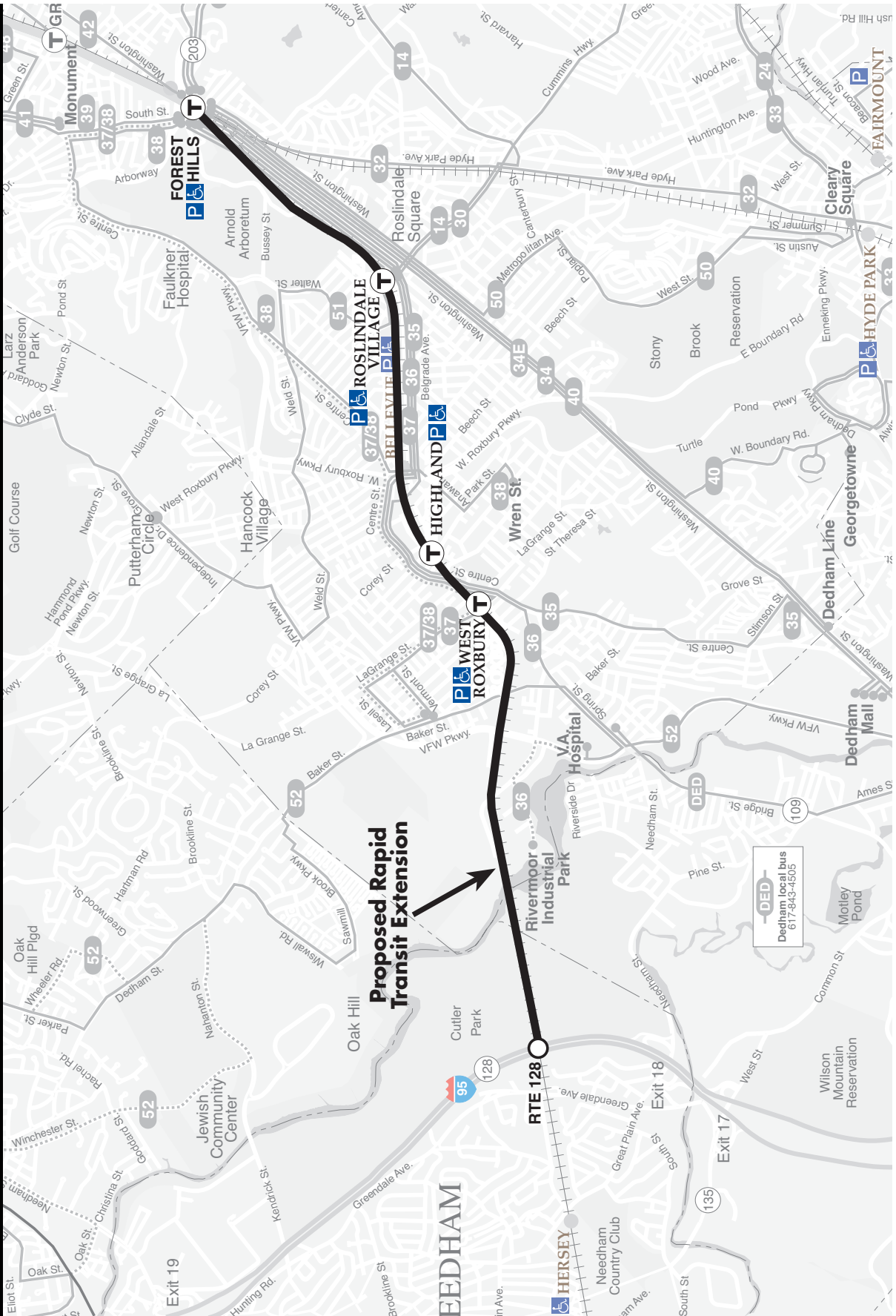
### Assessment

Overall, this project is rated low priority. It would supplement an existing commuter rail line with a rapid transit extension, providing more frequent and direct service to a greater number of destinations. This would be one of the more costly extensions examined in absolute terms and in capital and operating cost per new transit rider. It would be moderately effective in terms of air quality improvement and in cost relative to this improvement. Wetlands along the alignment near Route 128 could prevent the grade from being widened sufficiently to add Orange Line tracks. The existing Route 128 station layout does not provide for any additional tracks or platforms.

Type of Project	Utilization	Mobility	Cost-Effectiveness	Air Quality	Service Quality	Economic/Land Use Impacts	Environ. Justice
Line Extension	○	○	○	◐	◐	◐	◐



**MAP 5C-41 ORANGE LINE SOUTH EXTENSION FROM FOREST HILLS TO WEST ROXBURY/NEEDHAM**





## ORANGE LINE SOUTH EXTENSION FROM FOREST HILLS TO NEEDHAM

### Description

This project would extend Orange Line service from Forest Hills Station in Boston to Route 128 via the Needham commuter rail line right-of-way. Commuter rail service on this line would be discontinued.

### Capital Features

This would be a 5.1-mile extension, including two or three stations in West Roxbury, and a major park-and-ride facility at the outer terminal. This segment of the rail line is already fully grade-separated, but is mostly single-tracked. A second track would be needed for Orange Line service.

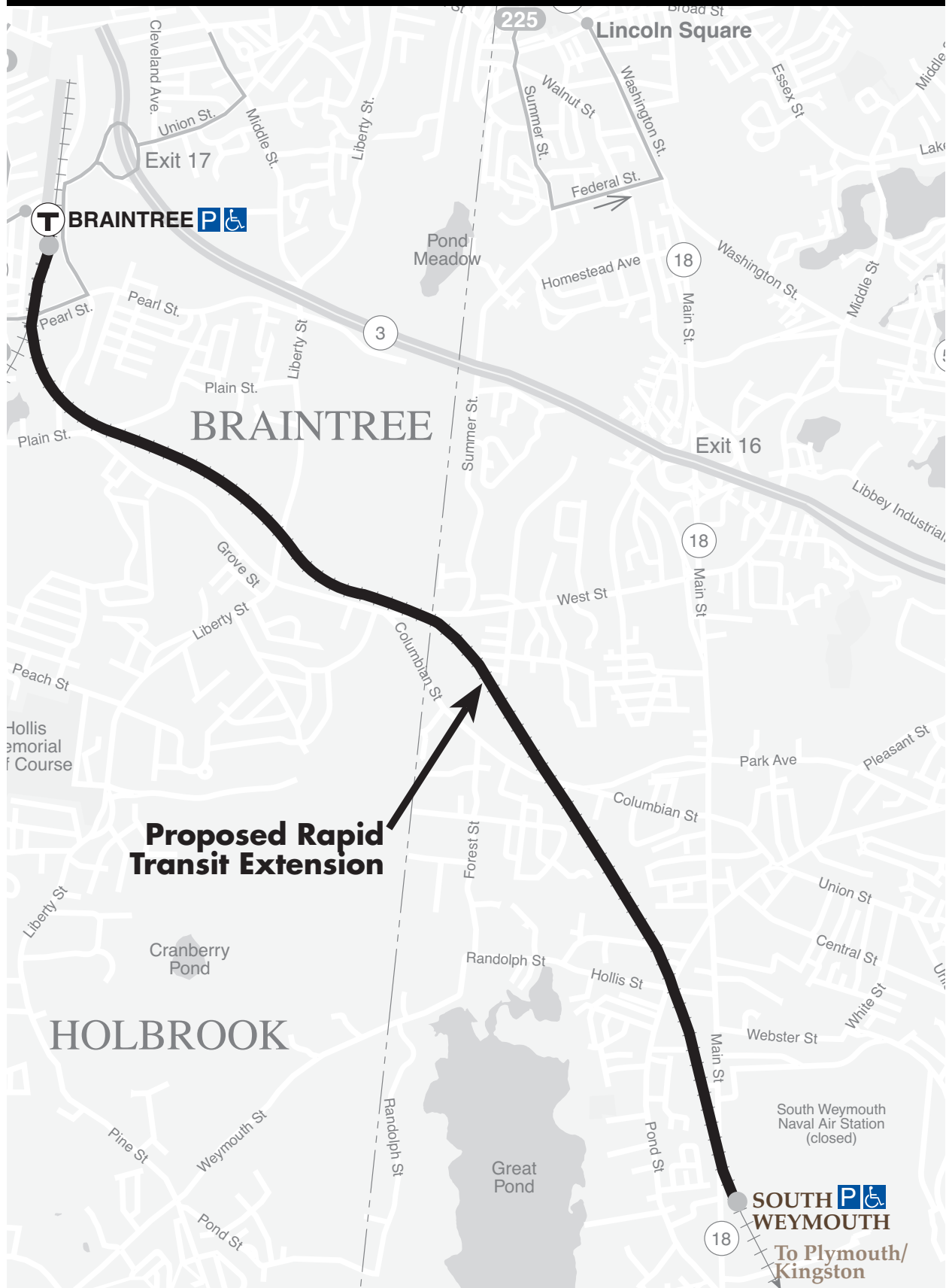
<b>Capital Cost</b>	<b>\$316.2 million (Based on 1994 PMT, adjusted to 2003)</b>
<b>Operating Cost</b>	<b>\$79,900 per weekday</b>
<b>Daily Ridership Increase on Mode</b>	<b>11,300</b>
<b>Net Increase in Daily Transit Ridership</b>	<b>600</b>
<b>Capital Cost per New Transit Rider</b>	<b>\$514,200</b>
<b>Operating Cost per Wkday/New Transit Rider</b>	<b>\$129.90</b>
<b>Capital Cost/Travel Time Benefit</b>	<b>\$2,804,700 per hour</b>
<b>Operating Cost/Travel Time Benefit</b>	<b>\$708.70 per hour</b>
<b>Travel Time Savings</b>	<b>113 hours per weekday</b>

### Assessment

Overall, this project is rated low priority. It would replace an existing commuter rail line with a rapid transit extension, providing more frequent and direct service to a greater number of destinations. This would be one of the more costly extensions examined in absolute terms and in capital and operating cost per new transit rider. It would be relatively ineffective in terms of air quality improvement and in cost to achieve to this improvement. The three outer stations on the present commuter rail line would no longer have rail transit service, and a commuter rail extension to Millis via Needham would no longer be feasible.

Type of Project	Utilization	Mobility	Cost-Effectiveness	Air Quality	Service Quality	Economic/Land Use Impacts	Environ. Justice
Line Extension	○	○	○	○	○	○	■

**MAP 5C-42 RED LINE EXTENSION TO WEYMOUTH**



**Proposed Rapid  
Transit Extension**



## RED LINE EXTENSION TO WEYMOUTH

### Description

This project would extend Red Line service from Braintree Station to South Weymouth, sharing the right-of-way of the Plymouth/Kingston commuter rail line.

### Capital Features

This would be a 4.3-mile extension, including one new station with a major park-and ride facility in Weymouth. Elimination of four grade crossings of roads and a grade separated crossing of the Red Line with the Old Colony commuter rail lines would be required.

<b>Capital Cost</b>	<b>\$304.2 million (CTPS estimate)</b>
<b>Operating Cost</b>	<b>\$52,000 per weekday</b>
<b>Daily Ridership Increase on Mode</b>	<b>6,700</b>
<b>Net Increase in Daily Transit Ridership</b>	<b>2,900</b>
<b>Capital Cost per New Transit Rider</b>	<b>\$104,900</b>
<b>Operating Cost per Wkday/New Transit Rider</b>	<b>\$17.90</b>
<b>Capital Cost/Travel Time Benefit</b>	<b>\$1,000,000 per hour</b>
<b>Operating Cost/Travel Time Benefit</b>	<b>\$171.00 per hour</b>
<b>Travel Time Savings</b>	<b>304 hours per weekday</b>

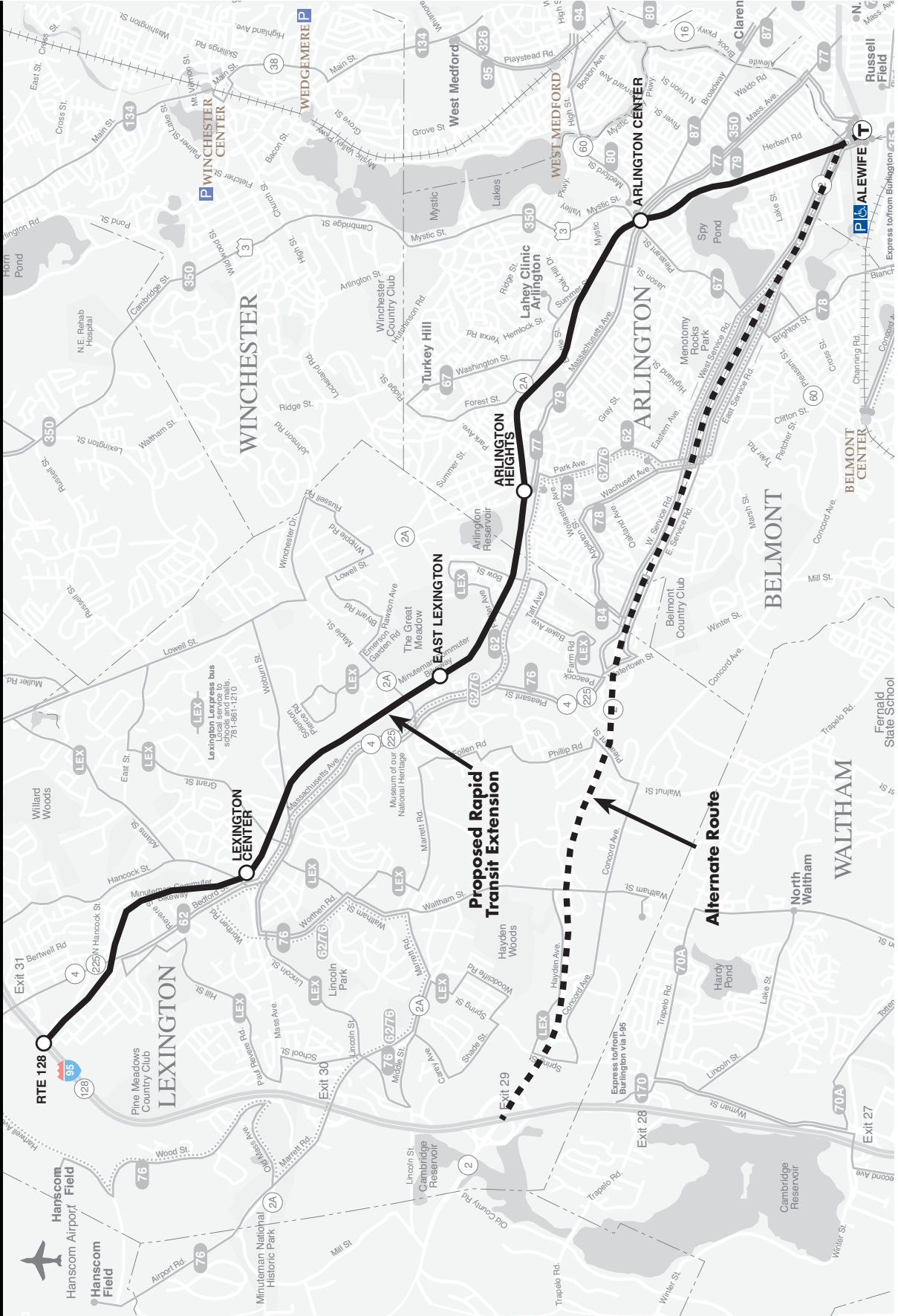
### Assessment

Overall, this project is rated low priority. It would bring Red Line service closer to the sources of many of the trips that are currently made via Braintree or Quincy Adams, and would help prevent overcrowding on the inner end of the Plymouth/Kingston commuter rail line. However, it would not result in transit service being provided to an area that does not currently have such service. Capital cost would be in the mid-range among rapid transit extension projects analyzed. It would also be in the mid-range of projects in terms of capital cost relative to new transit riders and to air quality improvements, even though the overall cost-effectiveness rating is low. It does, however receive a high rating for economic and land use impacts. The Weymouth station would be in a state-designated revitalization area and would aid in the redevelopment of a brownfield site.

Type of Project	Utilization	Mobility	Cost-Effectiveness	Air Quality	Service Quality	Economic/Land Use Impacts	Environ. Justice
Line Extension	▸	○	○	▸	○	●	○



**MAP 5C-43 RED LINE NORTHWEST EXTENSION FROM ALEWIFE TO RT 128**





## RED LINE NORTHWEST EXTENSION FROM ALEWIFE TO RT 128

### Description

This project would extend Red Line service from Alewife Station in Cambridge to Route 128 via the former Lexington Branch railroad alignment (now the route of the Minuteman Bikeway).

### Capital Features

This would be an 8.3-mile extension, including five new stations, in Arlington and Lexington, with a major park-and-ride facility at the outer terminal. Because of numerous grade-crossings, the tracks would have to be placed in cuts or subways for much of the way.

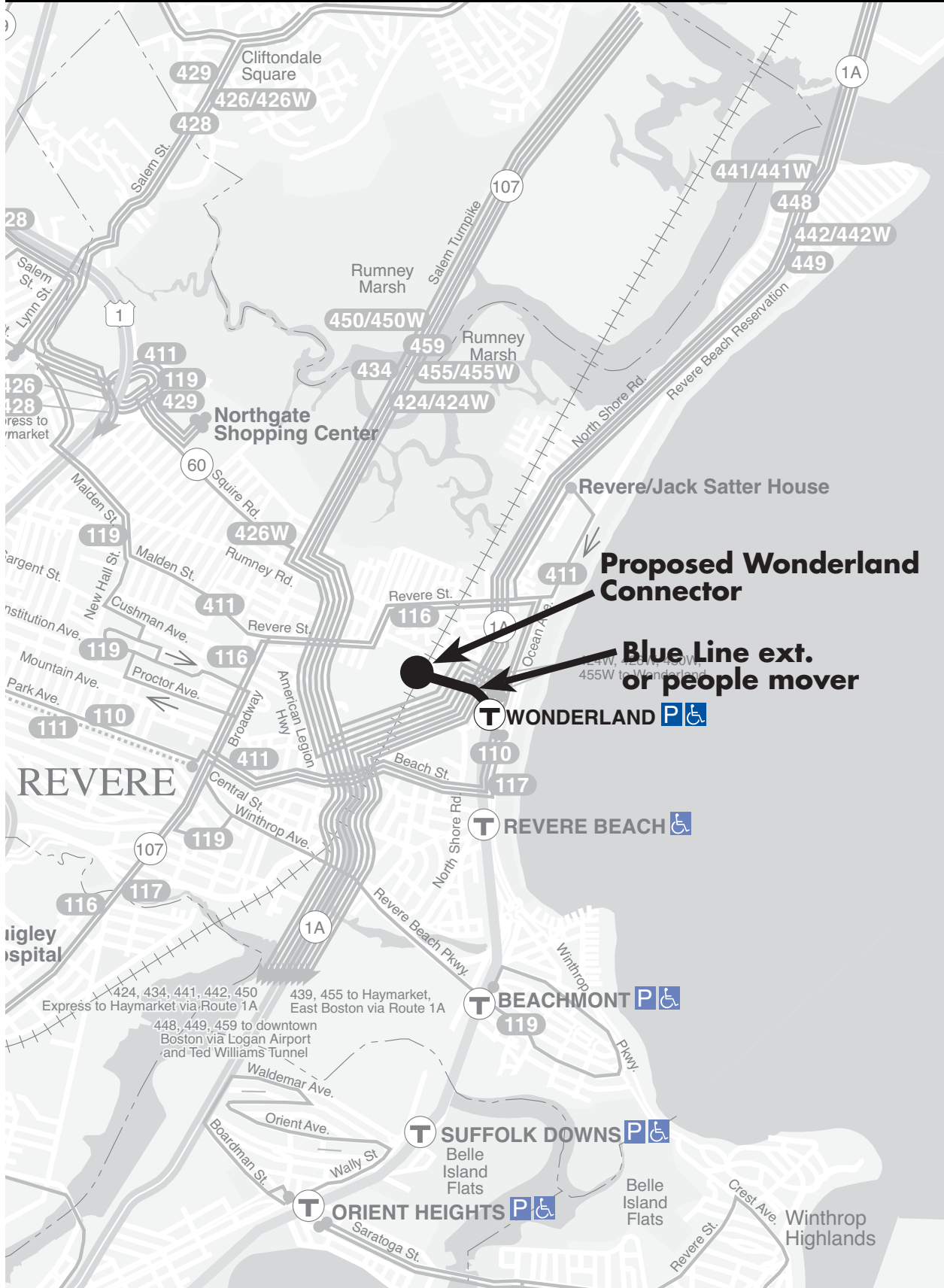
<b>Capital Cost</b>	<b>\$749.3 million (CTPS estimate)</b>
<b>Operating Cost</b>	<b>\$121,800 per weekday</b>
<b>Daily Ridership Increase on Mode</b>	<b>6,700</b>
<b>Net Increase in Daily Transit Ridership</b>	<b>1,700</b>
<b>Capital Cost per New Transit Rider</b>	<b>\$440,800</b>
<b>Operating Cost per Wkday/New Transit Rider</b>	<b>\$71.70</b>
<b>Capital Cost/Travel Time Benefit</b>	<b>\$421,700 per hour</b>
<b>Operating Cost/Travel Time Benefit</b>	<b>\$68.60 per hour</b>
<b>Travel Time Savings</b>	<b>1,777 hours per weekday</b>

### Assessment

Overall, this project is rated low priority. It would provide rail transit service to sections of Arlington and Lexington that are currently served by bus routes connecting with the Red Line. In absolute terms, it would be among the most costly of all rapid transit extensions examined for the PMT. It would also be in the lower range of projects in terms of new transit ridership attracted, and air quality benefits. Operating cost per new transit rider would be among the highest of any extension. Segments of the popular Minuteman Bikeway would have to be shut down during construction, and some might be lost permanently. The area served by this project has relatively sparse commercial or mixed-use development. The route would not provide direct service to any environmental justice target communities.

Type of Project	Utilization	Mobility	Cost-Effectiveness	Air Quality	Service Quality	Economic/Land Use Impacts	Environ. Justice
Line Extension	○	○	○	◐	◐	○	○

**MAP 5C-44 WONDERLAND CONNECTOR**



**Proposed Wonderland Connector**

**Blue Line ext. or people mover**



**Description**

This project calls for the construction of a station along the Newburyport/Rockport commuter rail line near Wonderland Station in Revere. Various alternatives exist to provide a direct physical link between the Blue Line and commuter rail service including a realignment of the Blue Line and an automated peplemover system. The MBTA is currently evaluating these options as part of its Draft Environmental Impact Statement (DEIS) for the Revere to Salem corridor.

**Capital Features**

Construction of an inter-modal passenger facility.

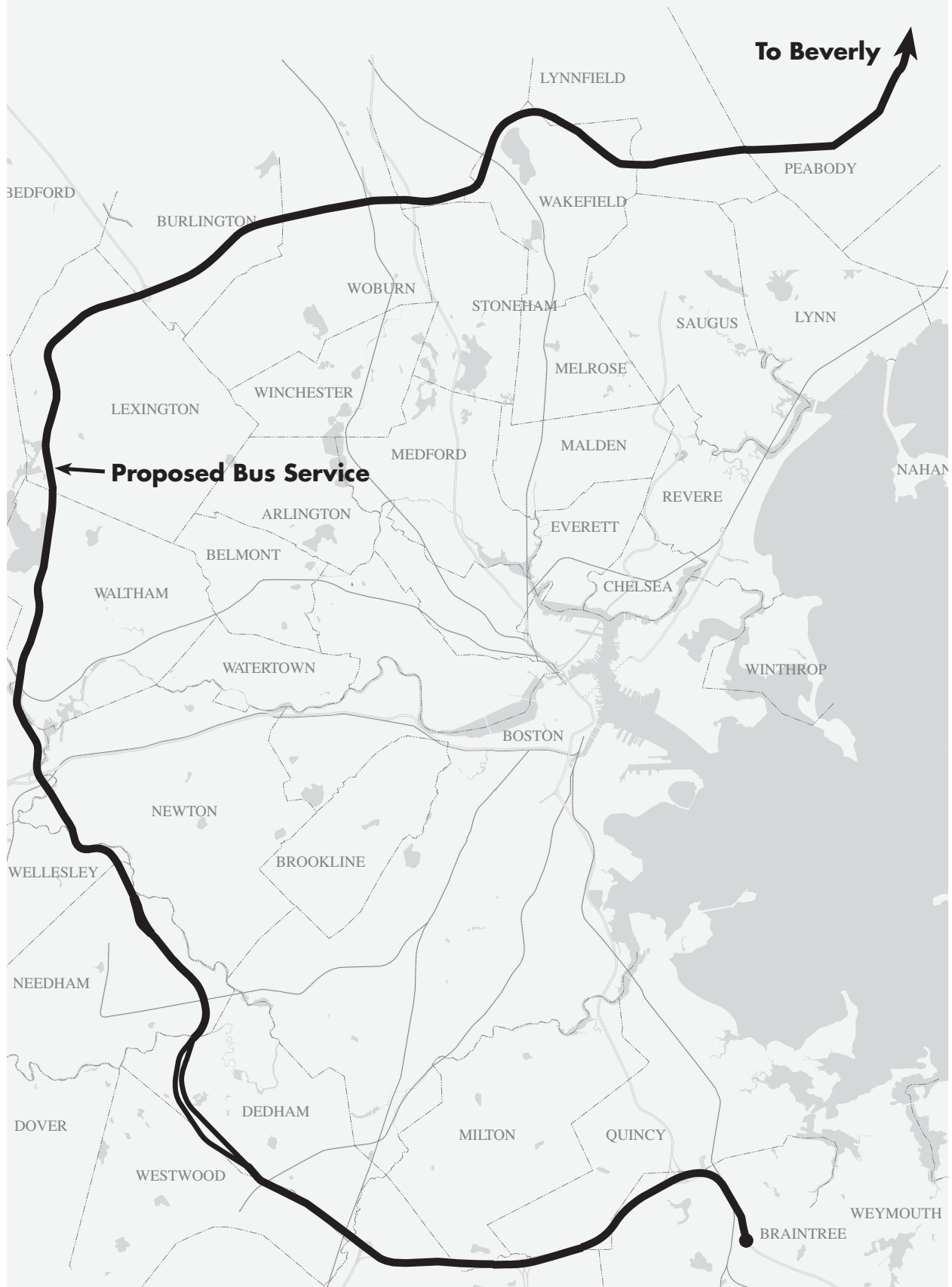
<b>Capital Cost</b>	<b>\$70.0 million (Based on 1997 Wonderland Feasibility Study, adjusted to 2003)</b>
<b>Operating Cost</b>	<b>none</b>
<b>Daily Ridership Increase on Mode</b>	<b>900</b>
<b>Net Increase in Daily Transit Ridership</b>	<b>500</b>
<b>Capital Cost/New Transit Rider</b>	<b>\$140,100</b>
<b>Operating Cost per Wkday/New Transit Rider</b>	<b>none</b>
<b>Capital Cost/Travel Time Benefit</b>	<b>\$604,600 per hour</b>
<b>Operating Cost/Travel Time Benefit</b>	<b>NA</b>
<b>Travel Time Savings</b>	<b>1 16 hours per weekday</b>

**Assessment**

This is a low priority rapid transit expansion project based on an analysis of the peplemover option. Other alternatives currently under review in the DEIS do not appear to match the community’s plans or the MBTA’s operational needs. The capital cost for this project would be \$70 million. There would be no additional typical day Blue Line operating costs. This project would attract 900 riders to the rapid transit mode, of which 500 would be new transit riders. Capital cost per new transit rider would be \$140,100. There would be minimal added costs to operate the connector once it is constructed. Access to Logan Airport would be improved via connections between the Blue Line and Commuter Rail. While this major transportation facility would be located in Revere, the city would receive little direct transportation benefit from the project. Thus the project receives a low environmental justice rating. The expansion of a transit facility in Wonderland would be compatible with regional plans and designated revitalization areas. The travel time benefit for this project would primarily be for commuter rail riders bound for destinations in the financial district which have close access to Aquarium and State Street stations on the Blue Line.

Type of Project	Utilization	Mobility	Cost-Effectiveness	Air Quality	Service Quality	Economic/Land Use Impacts	Environ. Justice
New Station	○	○	◐	◐	○	●	○

**MAP 5C-45 ROUTE 128 CIRCUMFERENTIAL BUS SERVICE**







## ROUTE 128 CIRCUMFERENTIAL BUS SERVICE

### Description

This proposal calls for providing bus service along Route 128 which would operate every 30 minutes in the peak and every 60 minutes in the off-peak. Service would operate between Beverly and Braintree, with stops provided at major interchanges and at connecting transit facilities. Employer feeder shuttles would link with the circumferential buses. Connections would be made with commuter rail, the Braintree branch of the Red Line, the Riverside branch of the Green Line, and several local bus routes. A general purpose travel lane in each direction would be converted to an HOV lane to improve bus travel times.

### Capital Features

Purchase of additional buses, conversion of a general traffic lane to an HOV lane in both directions.

<b>Capital Cost</b>	<b>\$29.0 million (CTPS estimate)</b>
<b>Operating Cost</b>	<b>\$22,400 per weekday</b>
<b>Daily Ridership Increase on Mode</b>	<b>4,200</b>
<b>Net Increase in Daily Transit Ridership</b>	<b>4,500</b>
<b>Capital Cost/New Transit Rider</b>	<b>\$6,900</b>
<b>Operating Cost per Wkday/New Transit Rider</b>	<b>\$5.00</b>
<b>Capital Cost/Travel Time Benefit</b>	<b>No benefit</b>
<b>Operating Cost/Travel Time Benefit</b>	<b>No benefit</b>
<b>Travel Time Savings</b>	<b>There are no travel time benefits</b>

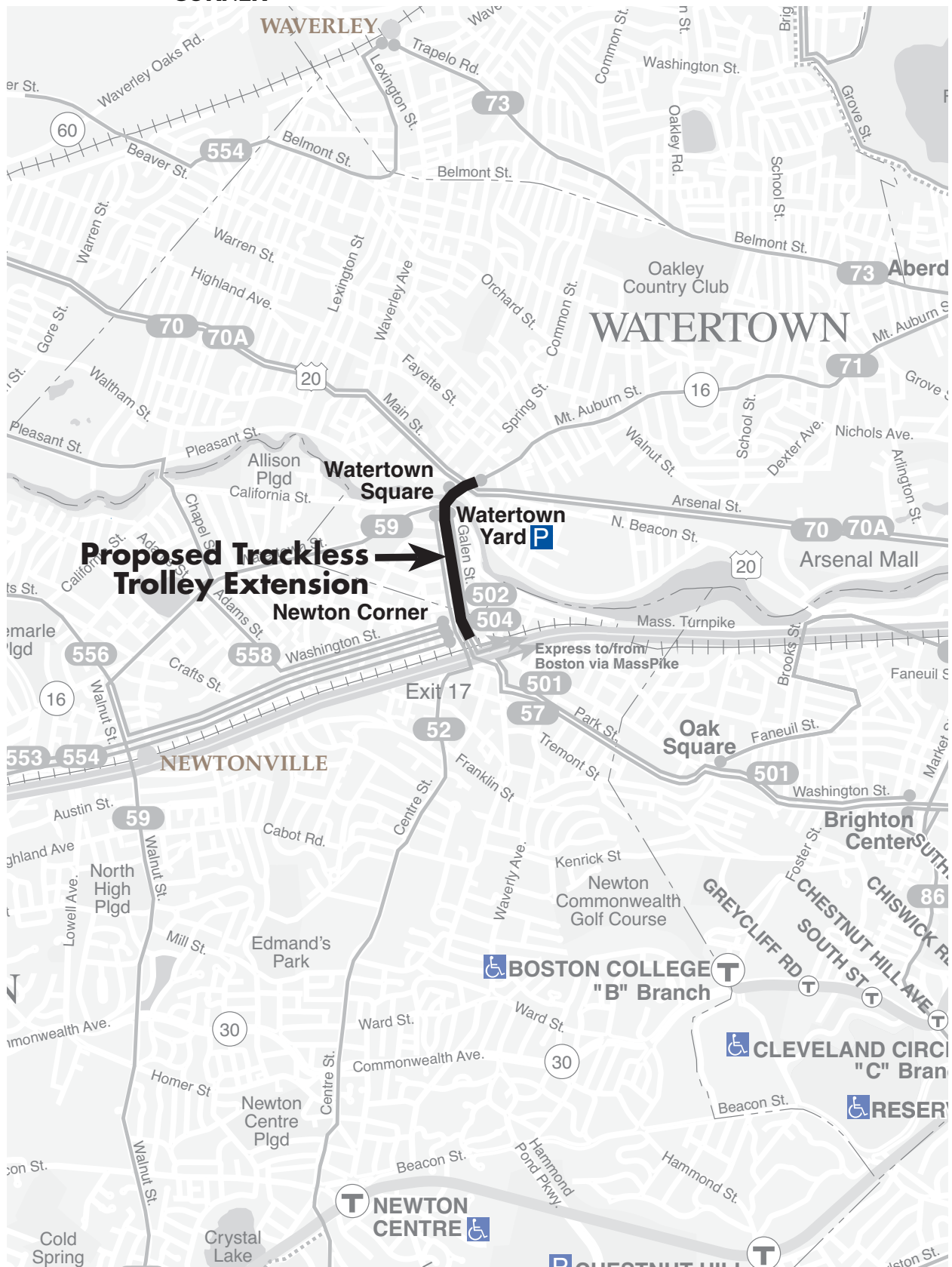
### Assessment

This is a low-priority bus expansion project. The capital costs for this project would be \$29 million and the typical daily operating costs would be \$22,400. This project would attract 4,200 riders to the mode, of which 4,500 would be new to transit. The capital cost per new transit rider would be \$6,900 while the operating cost per new rider would be \$5.00. The operating cost per new rider only receives a medium score compared to other projects in the same category and cost-effectiveness overall is rated low. Utilization receives a medium score, as the project would draw new riders from automobiles and increase transit mode share, but the travel time savings for this project are very poor. Mobility would be improved, as access would be provided to employment areas now without transit service. Direct connections would be provided to radial transit routes. Suburb to suburb travel would be direct and require shorter trips.

The service would not provide direct service to environmental justice target communities, but connections to the existing transit network would provide access to employment areas now only reachable via automobile. Service quality would be low however, as travel times would be long and reliability would be vulnerable to traffic congestion. Multiple transfers would still be required, as all riders traveling to suburban workplaces would need to transfer to circulator shuttles provided by employers to reach their final destination. The conversion of general purpose highway lanes to HOV lanes to benefit this project would result in a dramatic increase in congestion and travel times overall.

Type of Project	Utilization	Mobility	Cost-Effectiveness	Air Quality	Service Quality	Environ. Justice
Line Extension/ New Line	◐	●	○	○	○	○

**MAP 5C-46 EXTEND TRACKLESS TROLLEY #71 FROM WATERTOWN TO NEWTON CORNER**





## EXTEND TRACKLESS TROLLEY #71 FROM WATERTOWN TO NEWTON CORNER

### Description

This proposal calls for extending Route 71 Watertown-Harvard trackless trolley service between Watertown Square and Newton Corner. This would provide direct one-seat service between Newton Corner and locations served by Route 71 in Watertown and Cambridge. It would also provide a direct connection between Route 71 and bus routes 553, 554, 556, and 558 at Newton Corner. New trackless trolley wire would be extended over 0.5 miles of Galen Street in Watertown and the trackless trolley fleet would expand by one vehicle to provide the additional service.

### Capital Features

Installation of 0.5 route miles of new trackless trolley overhead contact system, purchase of one additional vehicle.

<b>Capital Cost</b>	<b>\$1.5 million (CTPS estimate)</b>
<b>Operating Cost</b>	<b>\$1,400 per weekday</b>
<b>Daily Ridership Increase on Mode</b>	<b>800</b>
<b>Net Increase in Daily Transit Ridership</b>	<b>600</b>
<b>Capital Cost/New Transit Rider</b>	<b>\$2,500</b>
<b>Operating Cost per Wkday/New Transit Rider</b>	<b>\$2.40</b>
<b>Capital Cost/Travel Time Benefit</b>	<b>\$23,200 per hour</b>
<b>Operating Cost/Travel Time Benefit</b>	<b>Travel time benefits not yet calculated</b>
<b>Travel Time Savings</b>	<b>65 hours per weekday</b>

### Assessment:

This is a low-priority bus expansion project. The capital costs for this project would be \$1.5 million and the typical daily operating costs would be \$1,400. This project would attract 800 riders to the mode, of which 600 would be new transit riders. The capital cost per new transit rider would be \$2,500 and the operating cost would be \$2.40 per new transit rider.

Utilization of this project would be low compared to other bus expansion projects proposed. The project would be cost effective overall compared to other bus expansion projects, operating costs per new passenger are good while capital costs per new transit rider receive a medium rating compared to other bus expansion projects. The project would result in a moderate positive impact on air quality, the actual reductions would be low but the capital cost per unit of reduction receives a medium score.

Connectivity between several existing bus routes would be improved, providing new one transfer service from a number of Newton communities.

Type of Project	Utilization	Mobility	Cost-Effectiveness	Air Quality	Service Quality	Environ. Justice
Line Extension/ New Line	○	○	●	◐	○	○